UCSC EXTENSION - SUMMER 2019 COURSE CATALOG

This catalog was generated on July 16, 2019 and the information contained in it is deemed accurate as of that date. We recommend referring to our website for the most up to date information.

CERTIFICATES

ACCOUNTING

Cost: $ 3,255
Required Credits: Total Required: 4 courses/16 units. End with certificate of completion review.
Duration: A full-time student can complete the certificate in 6–12 months.

Certificate Description

Understand the bottom line of your organization

Help build its future. In our four-course accounting certificate program you learn to analyze transactions, prepare financials, and explore complex issues so you can collaborate with management and communicate financial needs of an organization. This is a great foundation for someone interested in pursuing a career as a Certified Public Accountant (CPA®) or Certified Management Accountant (CMA®). Start building your career network with working professionals in the area.

Accounting certificate program objectives

Analyze transactions

Prepare financial statements

Understand complex accounting issues—investments revenue recognition, leases, bonds, and pensions; and

Collaborate with management to analyze and plan organizational financial needs.

Courses

1. Required Courses

Intermediate Accounting I, 4.0 Units
Intermediate Accounting II, 4.0 Units
Introduction to Accounting I: Financial Accounting, 4.0 Units
Introduction to Accounting II: Managerial Accounting, 4.0 Units

2. Required Certificate Review

Accounting Certificate Completion Fee

Requisite Knowledge

Please review the course descriptions to ensure that you have taken necessary prerequisites or meet the requirements through job experience or previous education.

Recommend Course Sequence

Introduction to Accounting I: Financial Accounting

Introduction to Accounting II: Managerial Accounting

Intermediate Accounting I

Intermediate Accounting II

To receive your certificate

Upon completion of the course sequence you may request your Accounting Certificate Completion Review.

ADMINISTRATIVE AND EXECUTIVE ASSISTANT

Cost: $ 5,500
Required Credits: Total Required: 8–10 courses/14.5 units. Take 5 core courses (9 units) and 3–5 elective credit courses (5.5 units). End with certificate of completion review.
Duration: A full-time student can complete the certificate in 6–12 months.

Certificate Description

Effective June, 2019—While most courses are still available in the Administrative Executive Assistant certificate program, we are not accepting new applications in 2019–2020. Students who have already declared candidacy will have an opportunity to complete the requirements for the certificate. To be eligible to receive a certificate, students must complete all required coursework within three years from the date they declared candidacy.

If you have questions or would like assistance with planning the completion of your program, please contact Student Engagement at (408) 861-3860 or ExtensionProgram@ucsc.edu .

Tailored instruction for the career professional.

The San Francisco Bay Area's only UC-approved program for administrative and executive assistants provides tailored instruction and mentoring from the regions' top executive assistants who have shaped the industry. Learn to increase your productivity and effectiveness, improve your ability to organize and prioritize, expand your network and build alliances, self-confidence, and respect. Our program prepares you to communicate business needs, manage multiple projects, master the technology, and multiply your impact at work.

Administrative and Executive Assistant certificate program objectives

Plan and lead effective meetings

Manage complex projects

Analyze and evaluate financial statements

Communicate business needs in writing and presentations

Collaborate with diverse teams

Courses

1. Required Courses

Business and Professional Writing, 2.0 Units
Communication Skills for Administrative and Executive Assistants, 2.0 Units
Finance for the Business Professional, 1.0 Units
Project Management for Administrative and Executive Assistants, 2.0 Units

2. Elective Courses

Applied Digital Marketing for Business: Tools, Technologies, Techniques and their Applications, 2.0 Units
Business Communications, 2.0 Units
Business Statistics I, 2.5 Units

Business Statistics II, 2.5 Units
Creating the Successful Team, 1.5 Units
CRM: Customer Relationship Management, Fundamentals, 2.0 Units
Cultural Proficiency, 2.0 Units
Facilitation Skills, 2.0 Units
Interviewing for Success: Using Structured Interviewing Techniques, 0.5 Units
Leading People Through Change, 0.5 Units
Organizational Development and Change, Introduction, 2.0 Units
Public Relations: Winning the Mindshare Battle, 1.5 Units
Role of the Project Manager, 1.5 Units
Schedule Optimization Techniques for Managers, 1.5 Units
Social Media Marketing Fundamentals, 2.0 Units

3. Capstone Course

Administrative and Executive Assistants Practicum, 2.0 Units

4. Required Certificate Review

Administrative and Executive Assistant Certificate Completion Fee

Requisite Knowledge

There are no prerequisites for the core courses, but **please review elective course descriptions** to ensure that you have taken necessary prerequisites or meet the requirements through job experience or previous education.

Recommend Course Sequence

Flexible course sequence

You can take courses in any order up to your final course: Administrative and Executive Assistants Practicum .

To receive your certificate

Upon completion of the course sequence you may request your Administrative and Executive Assistant Certificate Completion Review .

BIOINFORMATICS

Cost: $6,000
Required Credits: Total Required: 6–7 courses/16 units. Take 3 core courses (9 units) and 3–4 elective credit courses (7 units). End with certificate of completion review.
Duration: A full-time student can complete the certificate in 12 months.

Certificate Description

Get a computational and scientific foundation

This program is designed in consultation with industry leaders to meet the need for biologists and computer scientists to analyze and interpret today's deluge of biological information. Tailor your studies to your particular needs and interests while learning the tools and methods of bioinformatics. Life scientists delve into data tech and computer scientists gain a background in molecular biology.

Bioinformatics certificate program objectives:

Use public domain bioinformatics tools, including Genbank and PBD

Employ statistical design of experiment (SDOE) to analyze experimental data and factors affecting outputs

Distinguish key molecular biology techniques—gene cloning, manipulation and sequencing; PCR; RNA interference; and gene expression analysis

Complete a computational biology project using Java

Recognize sequence analysis techniques such as Hidden Markov Models and RNA analysis

Query and read DNA sequences from Fasta files

Courses

1. Prerequisite(s): "Molecular Biology, Introduction" and "Statistics" course or equivalent.

Statistics, 5.0 Units

2.Three Required Courses

Bioinformatics Tools, Databases and Methods, 3.0 Units
Experimental Methods in Molecular Biology, 3.0 Units
Statistical Analysis and Modeling for Bioinformatics and Biomedical Applications, 3.0 Units

3. Elective Course Seven Units Required

DNA Microarrays: Principles, Applications and Data Analysis, 3.0 Units
Drug Discovery, Introduction, 3.0 Units
Gene Expression and Pathways, 2.0 Units
Genomics and Next Generation DNA Sequencing: Methods and Applications, 3.0 Units

4. Fee for Certificate Review

Bioinformatics Certificate Completion Fee

Requisite Knowledge

Please review the course descriptions to ensure that you have taken necessary prerequisites or meet the requirements through job experience or previous education. **Molecular Biology Knowledge**: Each course requires a familiarity with the principles of modern molecular biology such as an introductory course in molecular biology taken in the last five years or equivalent professional experience. **Statistics Knowledge**: To take Statistical Analysis and Modeling for Bioinformatics and Biomedical Applications, you need an understanding of both probability and statistics. UCSC Extension offers Statistics .

Recommend Course Sequence

Please follow this sequence. After completing the prerequisites, those new to the field of bioinformatics should start with Bioinformatics Tools, Databases and Methods and Experimental Methods in Molecular Biology . Courses may then be taken in any sequence, unless otherwise specified in the individual course description.

Substitutions

You may take one elective outside the certificate curriculum, if you receive prior approval from the Academic Services Department.

To receive your certificate

Upon completion of the course sequence you may request your Bioinformatics Certificate Completion Review .

Dual Certification & Shared Credit

Learn more for Less: You can complete two bioscience certificate programs at UCSC Extension simultaneously or in sequence with fewer units than if the programs were taken individually. Students pursing two certificates need to:

Complete the total number of units indicated in the table below.

Complete all required courses for both programs.

Count each unit only once.

Select some electives that are common to both programs.

Biotechnology Clinical Trials Medical Devices Regulatory Affairs Bioinformatics Biotechnology 19 units 32 units 31 units 32 units 30 units Clinical Trials 32 units 19 units 31 units 32 units X Medical Devices 31 units 31 units 17 units 31 units X Regulatory Affairs 32 units 32 units 31 units 19 units X Bioinformatics 30 units X X X 16 units

BIOTECHNOLOGY

Cost: $6,200
Required Credits: Total Required: 7–9 courses/19 units. Take 4 core courses (12 units) and 3–5 electives (7 units—at least 1 unit from each track). End with certificate of completion review.
Duration: A full-time student can complete the certificate in 9–12 months.

Certificate Description

Work on the front lines of biopharma

Gain an understanding of scientific disciplines, a foundation in principles guiding drug discovery and development, an appreciation of the latest bioscience research and technology, and a broader awareness of today's biopharmaceutical industry. We offer instruction for professionals from all disciplines at all levels of experience. Focus on the theoretical fundamentals in the Discovery track or practical applications in our Development track.

Biotechnology certificate program objectives

Understand molecular diagnostics and their applications on healthcare

Break down key molecular biology techniques used to discover novel therapeutics

Explain the use of mass spectrometry in drug discovery

Recognize abnormalities in gene expression pathways and how they relate to human disease

Differentiate the roles and responsibilities of quality assurance (QA) and quality control (QC)

Courses

2.Core A Two Required Courses

Drug Development Process, 3.0 Units
Drug Discovery, Introduction, 3.0 Units

3. Core B Required Courses Choose 2 of 4

Biochemistry: An Introduction, 3.0 Units
Cellular Biology, 3.0 Units
Experimental Methods in Molecular Biology, 3.0 Units
Immunology, Principles, 3.0 Units

4. Track 1 Elective Courses 7 units required; a minimum of 1 of the 7 units must be from each track.

Biology of Cancer, 2.0 Units
DNA Microarrays: Principles, Applications and Data Analysis, 3.0 Units
Gene Expression and Pathways, 2.0 Units
Genomics and Next Generation DNA Sequencing: Methods and Applications, 3.0 Units
Human Physiology in Health and Disease, 3.0 Units
Stem Cell Biology, 1.5 Units
Toxicology Basics for Biotechnology, 1.5 Units
Viruses, Vaccines and Gene Therapy, 1.5 Units

5: Track 2 Elective Courses 7 units required; a minimum of 1 of the 7 units must be from each track.

Good Manufacturing Practices, 3.0 Units
ICH Quality Guidelines: Intent and Overview, 2.0 Units
Molecular Diagnostics, 1.5 Units
Regulation of Drugs and Biologics, 3.0 Units

6. Additional Courses of Interest

Clinical Trials Essentials: An Intensive One-Week Course, 3.5 Units
Data Privacy and Security for Healthcare and Biosciences, 1.5 Units

7. Fee for Certificate Review

Biotechnology Certificate Completion Fee

Requisite Knowledge

Please review the course descriptions to ensure that you have taken necessary prerequisites or meet the requirements through job experience or previous education. **Molecular biology**. Familiarity with the principles of modern molecular biology is required to begin the Biotechnology certificate. You can satisfy this requirement with an introductory course in molecular biology (taken within the last five years) or by demonstrating equivalent work experience.

Recommend Course Sequence

Please follow this sequence. Begin with these core courses: Drug Discovery, Introduction and Drug Development Process . After that, courses may be taken in any order provided the prerequisites are met.

Choose at least two core courses. Biochemistry: An Introduction , Cellular Biology , Experimental Methods in Molecular Biology , Immunology, Principles . Core courses may be taken as electives once the requisite two are taken.

Two Tracks. Choose at least one unit of elective credit from each track—Discovery and Development.

DISCOVERY TRACK

Biology of Cancer, 2 units

DNA Microarrays: Principles, Applications and Data Analysis, 3 units

Gene Expression and Pathways, 2 units

Human Physiology in Health and Disease, 3 unit

Genomics and Next Generation DNA Sequencing: Methods and Applications, 3 units

Stem Cell Biology, 1.5 units

Toxicology Basics for Biotechnology, 1.5 units

Viruses, Vaccines and Gene Therapy, 1.5 units

DEVELOPMENT TRACK

Drug Quality Fundamentals: Quality Control of Small Molecule Drugs & Biologics, 1.5 units

Good Manufacturing Practices, 3 units

Molecular Diagnostics, 1.5 units

Regulation of Drugs and Biologics, 3 units

Substitutions

You may take one elective outside the certificate curriculum, if you receive prior approval from the Academic Services Department.

Dual Certification & Shared Credit

Learn more for Less: You can complete two bioscience certificate programs at UCSC Extension simultaneously or in sequence with fewer units than if the programs were taken individually. Students pursing two certificates need to:

Complete the total number of units indicated in the table below.

Complete all required courses for both programs.

Count each unit only once.

Select some electives that are common to both programs.

Biotechnology Clinical Trials Medical Devices Regulatory Affairs Bioinformatics Biotechnology 19 units 32 units 31 units 32 units 30 units Clinical Trials 32 units 19 units 31 units 32 units X Medical Devices 31 units 31 units 17 units 31 units X Regulatory Affairs 32 units 32 units 31 units 19 units X Bioinformatics 30 units X X X 16 units To receive your certificate

Upon completion of the course sequence you may request your Biotechnology Certificate Completion Review .

Also of interest

Data Privacy and Security for Healthcare and Biosciences

Clinical Trials Essentials: An Intensive One-Week Course

BUSINESS ADMINISTRATION

Cost: $ 7,000
Required Credits: Total Required: 8–12 courses/25 units. Take 5 core courses (14 units) and 3–7 elective credit courses (11 units). End with certificate of completion review.
Duration: A full-time student can complete the certificate in 6–12 months.

Certificate Description

Build the foundation of successful leadership

Our program builds on the huge body of science underlying the latest best practices for management. You will gain practical skills to handle the day-to-day aspects of running a business and study evidence-based methods to maximize company performance. Network with industry professionals who teach facilitation, negotiation, coaching, and how to help employees carry out a unified vision. Choose courses from four tracks:

Business Essentials

Financial Analysis/Accounting

Management Development

Marketing Business Development.

Business Administration certificate program objectives

Understand how the American legal process can impact business

Communicate business needs effectively in person and in writing

Apply marketing principles and techniques to sell your products or services

Master the fundamentals of business finance

Navigate organizational change

Courses

1. Required Courses

Business Law and Its Environment, 3.0 Units
Finance I, Fundamentals, 3.0 Units
Management and Organization, Principles, 2.0 Units
Microeconomics, Introduction, 4.0 Units
Principles of Marketing, 2.0 Units

2. Elective Courses: Business Essentials

Business and Professional Writing, 2.0 Units
Effective Negotiations: Principles, Strategies, and Techniques, 1.5 Units
Facilitation Skills, 2.0 Units
International Business and the Global Economy, 3.0 Units
Principles of Business Analysis, 3.0 Units

3. Elective Courses: Financial Analysis/Accounting

Business Economics, 2.0 Units
Business Statistics I, 2.5 Units
Business Statistics II, 2.5 Units
Finance for the Business Professional, 1.0 Units
Financial Statement Analysis, 4.0 Units
Introduction to Accounting I: Financial Accounting, 4.0 Units
Introduction to Accounting II: Managerial Accounting, 4.0 Units

4. Elective Courses: Management Development

21st Century Leadership, 1.5 Units
Applied Organizational Behavior and Coaching, 3.0 Units
Business Communications, 2.0 Units
Creating the Successful Team, 1.5 Units
Human Resource Management, Introduction, 1.5 Units
Organizational Development and Change, Introduction, 2.0 Units

5. Elective Courses: Marketing Business Development

Marketing Operations 2.0: Tactical Discipline to Strategic Vision, 2.0 Units
Power of Market Research, 2.0 Units
Product Management: Moving the Product to Market, 2.0 Units

6. Required Certificate Review

Business Administration Certificate Completion Fee

Recommend Course Sequence

Flexible course sequence

Courses may be taken in any order provided the prerequisites are met.

Substitutions

Please note the following: Two of the required courses for this certificate have been suspended and will need to be substituted.

The substitute for Microeconomics, Introduction (4 units) is **Business Economics** (2 units). You will need to take an additional 2 units to make up the remaining unit requirement for the Business Administration certificate.

The substitute for Management and Organization, Principles (2 units) is **Applied Organizational Behavior and Coaching** (3 units). You may use the extra unit toward the required unit requirement for the Business Administration certificate.

You may also take one elective outside the certificate curriculum, if you receive prior approval from the Academic Services Department.

To receive your certificate

Upon completion of the course sequence you may request your Business Administration Certificate Completion Review .

CLINICAL TRIALS DESIGN AND MANAGEMENT

Cost: $ 8,000
Required Credits: Total Required: 8–10 courses/19 units. Take 6 core courses (14–15.5 units), 2–4 elective credit courses (5 units). End with certificate of completion review.
Duration:

Certificate Description

For the protection of trial subjects

Learn from leaders in the global biopharmaceutical and medical device industries who are discovering new treatments and health products every day. You will gain a solid and practical understanding of the entire clinical trials process—from drug and device development to monitoring—and gain a foundation in the scientific principles, current regulations, and ethical issues involved in clinical research.

Clinical Trials Design and Management certificate program objectives

Understand and apply Good Clinical Practices (GCP)

Distinguish regulatory requirements and differentiate between regulations, guidelines, policies and standard operating procedures (SOP)

Identify the roles, responsibilities, interactions and concerns of study site personnel

Use coding dictionaries such as MedDRA® and WHO-Drug for adverse event reporting

Prepare clinical trial reports, summaries and other documentation

Understand clinical trials designs, management, and approval objectives for drug and device development.

For successful interactions with clinical sites, investigators, regulators, contract research organizations, and sponsor management.

Understand the use of statistics in designing clinical trials and analysis of results.

Courses

1. Prerequisite Course

Medical / Clinical Terminology, 0.7 CEU's

2. Recommended Prerequisite Course

Human Physiology in Health and Disease, 3.0 Units

3. Six Required Courses. Choose one Device Course, either CTDM.X412 OR REGL.X404.

Clinical Statistics for Non-Statisticians, 2.0 Units
Clinical Trials Site Monitoring I, 2.0 Units
Drug Development Process, 3.0 Units
Good Clinical Practices, 3.0 Units

Medical Devices: Regulatory Strategies and Marketing Pathways, 1.5 Units
Regulation of Medical Devices and Diagnostics, 3.0 Units
Science of Clinical Trials Design, 2.5 Units

4. Five Elective Course Units Required

Clinical Data Management, 2.0 Units
Clinical Project Management, 2.0 Units
Clinical Research: The Study Site Perspective, 1.5 Units
Contracting with Contract Research Organizations (CROs), 1.5 Units
Document Preparation: Protocols, Reports, Summaries, 1.5 Units
Drug Safety and Adverse Events Reporting, 1.5 Units
Electronic Data Capture for Clinical Trials, 1.0 Units
Good Manufacturing Practices, 3.0 Units
Medical Writing, 2.0 Units
Preparing for FDA Inspections and Conducting Sponsor Audits, 1.5 Units

5. Additional Courses of Interest

Biology of Cancer, 2.0 Units
Clinical Trials Essentials: An Intensive One-Week Course, 3.5 Units
Viruses, Vaccines and Gene Therapy, 1.5 Units

6. Fee for Certificate Review

Clinical Trials Design and Management Certificate Completion Fee

Requisite Knowledge

Please review the course descriptions to ensure that you have taken necessary prerequisites or meet the requirements through job experience or previous education. **Prerequisites** Familiarity with medical terminology is required. You can satisfy this requirement by taking Medical/Clinical Terminology , an equivalent course, or substituting relevant work experience. We strongly recommend that students without a medical background take Human Physiology in Health and Disease early in their studies.

Recommend Course Sequence

Please follow this sequence: After completing the prerequisites, begin with Drug Development Process . After that, courses may be taken in any order provided the prerequisites are met. You must take one device course— Medical Devices: Regulatory Strategies and Marketing Pathways or Regulation of Medical Devices and Diagnostics .

Substitutions

You may take one elective outside the certificate curriculum, if you receive prior approval from the Academic Services Department.

To receive your certificate

Upon completion of the course sequence you may request your Clinical Trials Design and Management Certificate Completion Review .

Dual Certification & Shared Credit

Learn more for Less: You can complete two bioscience certificate programs at UCSC Extension simultaneously or in sequence with fewer units than if the programs were taken individually.

Students pursing two certificates need to:

Complete the total number of units indicated in the table below.

Complete all required courses for both programs.

Count each unit only once.

Select some electives that are common to both programs.

Biotechnology Clinical Trials Medical Devices Regulatory Affairs Bioinformatics Biotechnology 19 units 32 units 31 units 32 units 30 units Clinical Trials 32 units 19 units 31 units 32 units X Medical Devices 31 units 31 units 17 units 31 units X Regulatory Affairs 32 units 32 units 31 units 19 units X Bioinformatics 30 units X X X 16 units

COMPUTER PROGRAMMING

Cost: $6,000
Required Credits: Total Required: 5–7 courses/14 units. Take 2 of the 5 core courses (6 units) and 3–5 elective credit courses (8.5–9 units). End with certificate of completion review.
Duration: A full-time student can complete the certificate in 9–12 months.

Certificate Description

Power up your programming

Whether you're learning something new or brushing up your developer skills, dive into a pool of expertise—from Python, Go, and Perl, to machine learning, HADOOP, and object-oriented development. Choose from two levels of courses to suit your needs. Learn the fundamentals, then go beyond into internet-based programming and iPhone and Android mobile application development.

Computer Programming certificate program objectives:

Write programs in C, C++, C# .NET, Java, Perl, HTML or XML

Develop applications for Android and iPhone mobile devices

Design an object-oriented system

Understand the basics of machine learning and data mining

Employ computational and artificial intelligence techniques

Courses

1. CORE COURSES

C# .NET Programming, Comprehensive, 3.0 Units
C Programming, Advanced, 3.0 Units
C++ Programming, Comprehensive, 3.0 Units
Java Programming, Comprehensive, 3.0 Units
Object-Oriented Analysis and Design, 3.0 Units
Python for Programmers, 3.0 Units

2. ELECTIVE COURSES: C PROGRAMMING

C Programming, Advanced, 3.0 Units
C Programming for Beginners, 2.0 Units

3. ELECTIVE COURSES: C++ PROGRAMMING

C++ Programming, Comprehensive, 3.0 Units
Data Structures and Algorithms Using C++, 3.0 Units

4. ELECTIVE COURSES: JAVA PROGRAMMING

Data Structures and Algorithms Using Java, 3.0 Units
Java Programming, Comprehensive, 3.0 Units
Java Programming for Beginners, 2.0 Units
JUnit Test Framework, 1.5 Units

XML Essentials, 2.0 Units

5. ELECTIVE COURSES: SCRIPTING LANGUAGES

Python for Programmers, 3.0 Units
Python: Object-Oriented Programming, 2.0 Units
Python Programming for Beginners, 1.5 Units

6. ELECTIVE COURSES: WINDOWS PROGRAMMING

C# .NET Programming, Advanced, 3.0 Units
C# .NET Programming, Comprehensive, 3.0 Units

7. ELECTIVE COURSES: MOBILE DEVICE PROGRAMMING

Mobile Application Development - Android and iOS, Advanced, 3.0 Units
Mobile Application Development - Android and iOS, Introduction, 3.0 Units

8. ELECTIVE COURSES: ADVANCED PROGRAMMING AND CONCEPTS

Computational Intelligence, Introduction, 1.5 Units
Designing Big Data Applications - Foundations, 3.0 Units
Go Programming, Fundamentals, 3.0 Units
Introduction to Machine Learning and Data Mining, 3.0 Units
Mastering Data Structures and Algorithms: A Practical Approach, 3.0 Units
Object-Oriented Analysis and Design, 3.0 Units
Object-Oriented Development: Architecture and Design Patterns, Advanced, 3.0 Units

9. REQUIRED CERTIFICATE REVIEW

Computer Programming Certificate Completion Fee

Requisite Knowledge

Please review the course descriptions to ensure that you have taken necessary prerequisites or meet the requirements through job experience or previous education.

Recommend Course Sequence

Get started

Courses are best taken in order of complexity—I, II, III; Beginners, Comprehensive, Advanced. Other courses may be taken in any order.

Substitutions

You may take one elective outside the certificate curriculum, if you receive prior approval from the Academic Services Department.

To receive your certificate

Upon completion of the course sequence you may request your Computer Programming Certificate Completion Review .

DATABASE AND DATA ANALYTICS

Cost: $6,000
Required Credits: Total Required: 5–7 courses/14 units. Take 1 required course (3 units) and 4–6 elective credit courses (11 units). End with certificate of completion review.
Duration: A full-time student can complete the certificate in 9–12 months.

Certificate Description

Data-driven business. Understand, manage, and analyze the data that is driving business and innovation. We offer database training and data analytics course sequences to prepare you for a career in big data or database management. Work with algorithms, tools, frameworks, and best practices in managing big data and performing data mining. Here's where the data analysist, data scientist or data engineers find their secret powers to soar through today's data explosion and discover valuable business intelligence.

Database and Data Analytics certificate program objectives:

Install and configure an Oracle database 12c instance

Understand the basics of machine learning and data mining

Write complex queries in MySQL

Install, deploy, and develop a website's back-end using Linux, Apache, MySQL and PHP (LAMP)

Create data models for enterprise application

Courses

1. CORE COURSES (Choose one)

Data Analysis, Introduction, 3.0 Units
Relational Database Design and SQL Programming, 2.0 Units

2. ELECTIVE COURSES: DATA ANALYSIS

Big Data: Overview, Tools and Use Cases, 3.0 Units
Business Intelligence Solutions, 2.0 Units
Dashboards and Data Visualization, 3.0 Units
Data Analysis, Introduction, 3.0 Units
Data Modeling, Introduction, 2.0 Units
MySQL and Oracle Database for Developers and Designers, 2.0 Units
NoSQL Databases, Introduction, 3.0 Units
Python for Data Analysis, 3.0 Units
Relational Database Design and SQL Programming, 2.0 Units

3. ELECTIVE COURSES: DATA SCIENCE

AI-Led Enterprise Transformation: Technologies and Use Cases, 0.5 Units
Artificial Intelligence, Machine Learning, and the Deep Learning Landscape, Introduction
Big Data: Overview, Tools and Use Cases, 3.0 Units
Deep Learning and Artificial Intelligence with Keras, 3.0 Units
Deep Learning and Artificial Intelligence with TensorFlow, 3.0 Units
Introduction to Machine Learning and Data Mining, 3.0 Units

Predictive Analytics: Applications of Machine Learning, 3.0 Units

4. ELECTIVE COURSES: DATA ENGINEERING

Apache Spark with Scala, Introduction, 3.0 Units
Big Data: Overview, Tools and Use Cases, 3.0 Units
Designing Big Data Applications - Foundations, 3.0 Units
Designing, Building and Integrating RESTful API, 2.0 Units
LAMP: Linux Based Web Application Development – Apache, MySQL, PHP, 3.0 Units
The Internet of Things: Big Data Processing and Analytics, 3.0 Units

5. ELECTIVE COURSES: RELATED ELECTIVES

Java Programming, Comprehensive, 3.0 Units
Java Programming for Beginners, 2.0 Units
Python for Programmers, 3.0 Units
Python Programming for Beginners, 1.5 Units
XML Essentials, 2.0 Units

6. REQUIRED CERTIFICATE REVIEW

Database and Data Analytics Certificate Completion Fee

Requisite Knowledge

Please review the course descriptions to ensure that you have taken necessary prerequisites or meet the requirements through job experience or previous education.

Recommend Course Sequence

Please follow this sequence. Begin with your core course, either Data Analysis, Introduction or Relational Database Design and SQL Programming . After that, courses may be taken in any order provided the prerequisites are met.

Substitutions. You may take one elective outside the certificate curriculum, if you receive prior approval from the Academic Services Department.

To receive your certificate. Upon completion of the course sequence you may request your Database and Data Analytics Certificate Completion Review .

EARLY CHILDHOOD EDUCATION

Cost: $5,200
Required Credits: Total Required: 10–13 courses/35 units. Take 9 core courses (32 units) and 1–3 elective credit courses (3 units). End with certificate of completion review.
Duration: A full-time student can complete the certificate in 9–12 months.

Certificate Description

Teach our youngest to love learning.

In this two-track ECE program entry-level students gain a strong foundation in child growth and development, literacy, and age-appropriate teaching strategies, developmentally based curriculum, and current research and trends. You will develop skills to teach and supervise infants, toddlers, and young children while working toward a Child Development permit.

Early Childhood Education certificate program objectives

Develop age-appropriate curriculum for the ECE classroom

Understand social, emotional, physical and cognitive development from prenatal stages through middle childhood

Promote oral language abilities through active use of books, poetry, dramatic play and group discussion

Decode healthcare policies and procedures in the child-care setting

Communicate with and develop effective relationships with parents.

Courses

1. Required Courses

ECE 1: Development in Early Childhood, 4.0 Units
ECE 2: Introduction to Teaching Young Children, 3.0 Units
ECE 3: Curriculum Development in Early Childhood Programs, 4.0 Units
ECE 4: The Young Child in the Family and Community, 4.0 Units
ECE 5: Positive Guidance and Discipline for the Young Child, 3.0 Units
ECE 6: Culture and Diversity in the Early Childhood Classroom, 3.0 Units
ECE 7: Practicum in Early Childhood Education, 5.0 Units
ECE 8: Child Health, Safety and Nutrition, 3.0 Units
ECE 9: Language and Literacy for the Young Child, 3.0 Units

2. Elective Courses

Attention Deficit Hyperactivity Disorder (ADHD) in the Classroom, 3.0 Units
ECE: Brain Development in Early Childhood, 1.0 Units
ECE: CPR and First Aid
ECE: Creative Arts for the Young Child (Preschool Through Grade 3), 3.0 Units
ECE: Infant/Toddler Growth and Development, 2.0 Units
ECE: Principles of Infant/Toddler Caregiving, 2.0 Units
Math Development in Young Children, 2.0 Units
Science Play: Inquiry-Based Learning Made Easy, 1.0 Units

3. Required Certificate Review

Early Childhood Education Certificate Completion Fee

Requisite Knowledge

There are no requirements to join the program.

Recommend Course Sequence

Flexible course sequence

Courses may be taken in any order provided the prerequisites are met and your final course is ECE 7: Practicum in Early Childhood Education .

Substitutions

You may take one elective outside the certificate curriculum, if you receive prior approval from the Academic Services Department.

To receive your certificate

Upon completion of the course sequence you may request your Early Childhood Education Certificate Completion Review .

ECE SUPERVISION AND ADMINISTRATION

Cost: $3,000
Required Credits: Total Required: 6–9 courses/18 units. Take 4 core courses (12 units) and 2-–5 elective credit courses (6 units). End with certificate of completion review.
Duration: A full-time student can complete the certificate in 9–12 months.

Certificate Description

Head up your own ECE center

Running your own day care center or serving as a site supervisor for our youngest learners requires the vision of an entrepreneur, the skills of a manager, and the heart of a teacher. Learn best practices for recruiting, teacher training, and staff management while working toward your state child development site supervisor or program director permit. You will learn to instill positive guidance and discipline into your curriculum for infants, toddlers, and young children.

ECE Supervision and Administration certificate program objectives:

Develop age-appropriate curriculum for the ECE classroom

Understand social, emotional, physical, and cognitive development from prenatal stages through middle childhood

Promote oral language abilities through active use of books, poetry, dramatic play, and group discussion

Instill positive guidance and discipline

Learn how to introduce a love for math and art.

Decode healthcare policies and procedures in the child care setting

Communicate with and develop effective relationships with parents

Courses

1. Required Courses

ECE 10: Supervision and Administration: Parents as Partners in Education, 3.0 Units
ECE 11: Supervision and Administration of Early Childhood Centers, Part A, 3.0 Units
ECE 12: Supervision and Administration of Early Childhood Centers, Part B, 3.0 Units
ECE 13: Adult Supervision and Mentoring, 3.0 Units

2. Elective Courses

Attention Deficit Hyperactivity Disorder (ADHD) in the Classroom, 3.0 Units
ECE: Brain Development in Early Childhood, 1.0 Units
ECE: CPR and First Aid
ECE: Creative Arts for the Young Child (Preschool Through Grade 3), 3.0 Units
ECE: Infant/Toddler Growth and Development, 2.0 Units
ECE: Principles of Infant/Toddler Caregiving, 2.0 Units
Math Development in Young Children, 2.0 Units
Science Play: Inquiry-Based Learning Made Easy, 1.0 Units

3. Required Certificate Review

Early Childhood Education: Supervision and Administration Certificate Completion Fee

Recommend Course Sequence

Flexible course sequence

Courses may be taken in any order provided the prerequisites are met.

Substitutions

You may take one elective outside the certificate curriculum, if you receive prior approval from the Academic Services Department.

To receive your certificate

Upon completion of the course sequence you may request your Early Childhood Education: Supervision and Administration Certificate Completion Review.

EDUCATIONAL THERAPY

Cost: $6,000
Required Credits: Total Required: 10–11 courses/30 units. Take 8 core courses (26 units) and 2–3 elective credit courses (4 units)
Duration: A full-time student can complete the certificate in 9–12 months.

Certificate Description

The impact of inspired learning

Learn how individualized interventions can make a tremendous impact in the classroom, in private practice, and in the home. In one of the few **Association of Educational Therapists-approved** training programs, you will learn to assess the different challenges students have so you can effectively collaborate with an educational team and understand the underlying theory and the latest research to implement practical strategies for learning. Teachers, tutors, resource specialists, and aspiring educational therapists will learn to empower and inspire their students. Material also supports you in setting up your own clinical practice.

Educational Therapy certificate program objectives:

Understand challenges faced by students with ADHD, autism, Asperger's Syndrome, nonverbal learning disorder, sensory integration disorder, fetal alcohol syndrome, oppositional defiant disorder, and other learning differences

Comprehend the theories, issues, strategies, and materials related to the assessment and instruction of students with reading difficulties

Apply strategies for helping students understand computation and problem-solving in mathematics

Develop a business plan for managing your own clinical practice

Use assessment tools and procedures frequently used in educational therapy settings

Courses

1. Required Courses

Educational Assessments I, 3.0 Units
Educational Assessments II, 3.0 Units
Educational Therapy: Reading I, 3.0 Units
Management of Clinical Practice, 3.0 Units
Principles of Educational Therapy, 3.0 Units
Strategies for Learning Differences in Mathematics, 3.0 Units
Techniques of Educational Therapy: Affective, Cognitive and Perceptual Elements, 3.0 Units

2. Elective Courses

Attention Deficit Hyperactivity Disorder (ADHD) in the Classroom, 3.0 Units
ECE: Brain Development in Early Childhood, 1.0 Units
Psychology of Human Learning, 2.0 Units
Understanding Learning Differences, 3.0 Units

3. Capstone Course

Educational Therapy Practicum, 5.0 Units

4. Required Certificate Review

Educational Therapy Certificate Completion Fee

Requisite Knowledge

Please review the course descriptions to ensure that you have taken necessary prerequisites or meet the requirements through job experience or previous education.

Recommend Course Sequence

Flexible course sequence

Courses may be taken in any order provided the prerequisites are met and your final course is Educational Therapy Practicum .

Substitutions

You may take one elective outside the certificate curriculum, if you receive prior approval from the Academic Services Department.

To receive your certificate

Upon completion of the course sequence you may request your Educational Therapy Certificate Completion Review.

EMBEDDED SYSTEMS

Cost: $5,700 or 5,770
Required Credits: Total Required: 5–10 courses/14 units—1 of the core courses (2–3 units) and 3–9 elective credit courses (12–16.5 units)
Duration: A full-time student can complete the certificate in 9–12 months.

Certificate Description

Build your knowledge of universal connectivity

Our hardware professional students learn to design function-specific computer and communication systems, including mobile devices, the Internet of Things, networking equipment, industrial controllers, and military electronics.

Four hardware design tracks

System Design

FPGA Design

Embedded Linux

Embedded Software

Apply your knowledge of microprocessors, digital signal processors (DSPs) and microcontrollers and design and test hardware and software innovations of the future.

Embedded Systems certificate program objectives

Design, debug, and synthesize digital logic for ASICs, PGAs, and IP cores

Understand the basics of embedded hardware design

Differentiate between types of jitter

Decode IO technologies, including PCI Express, Ethernet and Fibre Channel

Use analog and digital switch-mode power supplies

Courses

1. CORE COURSES (Choose One)

Embedded Firmware Essentials, 2.0 Units
Embedded Linux Design and Programming, 3.0 Units
Embedded System Hardware Architectures, Introduction, 3.0 Units
Practical Design with Xilinx FPGAs, 3.0 Units
Real-Time Embedded Systems Programming, Introduction, 3.0 Units

2. ELECTIVE COURSES: System Design

Comprehensive Signal and Power Integrity for High-Speed Digital Systems, 3.0 Units
Design and Analysis of High-Performance Memory Systems, 3.0 Units
Embedded System Hardware Architectures, Introduction, 3.0 Units

High Efficiency Switch-mode Power Supply, Design Overview, 3.0 Units
Introduction to Robotics, 2.0 Units
IO Concepts and Protocols: PCI Express, Ethernet, and Fibre Channel, 3.0 Units
IO Design Fundamentals, 3.0 Units
Jitter Essentials, 1.5 Units
Practical Design & Implementation of High Efficiency Switch-mode Power Supplies, 3.0 Units
Printed Circuit Board Design for Signal Integrity and EMC Compliance, 1.5 Units
Wireless Communications and Mobile Antenna Design, Introduction, 3.0 Units

3. ELECTIVE COURSES: FPGA Design

Digital Design with FPGA, 3.0 Units
Embedded Design with Xilinx FPGAs, 3.0 Units
Practical Design with Xilinx FPGAs, 3.0 Units

4. ELECTIVE COURSES: Embedded Linux

Embedded Linux Design and Programming, 3.0 Units
Linux Device Drivers, 3.0 Units
Linux Device Drivers, Advanced, 3.0 Units

5. ELECTIVE COURSES: Embedded Software

C Programming, Advanced, 3.0 Units
C Programming for Beginners, 2.0 Units
Embedded Firmware Essentials, 2.0 Units
Real-Time Embedded Systems Programming, Introduction, 3.0 Units
The Internet of Things: Big Data Processing and Analytics, 3.0 Units
The Internet of Things: Sensors, Platforms, Communications, and Applications, 3.0 Units

6. ELECTIVE COURSES: Related Electives

Digital Logic Design Using Verilog, 3.0 Units
SystemVerilog Essentials: Functional Verification and Simulation, 1.5 Units

7. REQUIRED CERTIFICATE REVIEW

Embedded Systems Certificate Completion Fee

Requisite Knowledge

Technical aptitude You need a degree in a technical field or equivalent knowledge acquired through training and experience in system design and development. We recommended you have experience in **C programming**. Please review course descriptions Make sure you have taken necessary prerequisites or meet the requirements through job experience or previous education before registering for a course.

Recommend Course Sequence

For the certificate program, please begin with one of the five core* courses. After the core requirement is met, courses may be taken in any order provided the prerequisites are met.

These are the 4 tracks of study:

System Design

FPGA Design

Embedded Linux

Embedded Software

Substitutions

You may take one elective outside the certificate curriculum, if you receive prior approval from the Academic Services Department.

To receive your certificate

Upon completion of the course sequence you may request your Embedded Systems Certificate Completion Review.

HUMAN RESOURCE MANAGEMENT

Cost: $7,500
Required Credits: Total Required: 11 courses/ 15–19.5 units. Take 8 core courses (13.5 units) and 3 elective credit courses (1.5–_6 units). End with the certificate review.
Duration: A full-time student can complete the certificate in 6–12 months.

Certificate Description

Recruit, train, and lead a diverse workforce

Our Human Resource Management program helps you identify, motivate, develop and support employees in any field. In today's ultra competitive economy, you need to know how to recruit and retain top employees, communicate effectively, decode compensation and benefits, and understand how technology is changing the landscape. Learn systems and processes that support business objectives, develop effective leaders, and create supportive work environments. Pick and choose electives from four specialties:

Talent Acquisition and Workforce Planning

Leadership Development

Employee Relations

HR Business Partners/Generalist

Human Resource Management certificate program objectives

Design, assess and evaluate employee benefits programs

Recruit talent and plan a strategic workforce

Train, facilitate and design instruction for employees

Evaluate performance management approaches and techniques

Navigate organizational development, design and change management to assure high employee engagement and productivity

Courses

1. Required Courses

Benefits Management: A Comprehensive Study of Employee Benefit Programs, 2.0 Units
Compensation Management, 2.0 Units
Effective Employee Relations, 1.5 Units
Finance for the Business Professional, 1.0 Units
Human Resource Management, Introduction, 1.5 Units
Law and Human Resource Management, 2.0 Units
Managing the Staffing Function, 1.5 Units
Organizational Development and Change, Introduction, 2.0 Units

2. Elective Courses: Recruiting and Staffing

Effective Performance Management, 2.0 Units

Interviewing for Success: Using Structured Interviewing Techniques, 0.5 Units
Talent Acquisition 101, 1.0 Units

3. Elective Courses: Leadership Development

Business Communications, 2.0 Units
Facilitation Skills, 2.0 Units
Leading People Through Change, 0.5 Units
Learning Theories and Styles, 1.0 Units
People Analytics–Delivering Measurable Business Impact, 1.5 Units

4. Elective Courses: Employee Relations

Cultural Proficiency, 2.0 Units
Effective Negotiations: Principles, Strategies, and Techniques, 1.5 Units
Terminating and Managing Problem Employees, 0.5 Units
Workplace Investigations, 0.5 Units

5. Elective Courses: HR Business Partners/Generalist

HR Technology - What You Need To Know To Be A Technology Proponent, 1.5 Units
Human Resources Business Partner (HRBP) Excellence, 1.0 Units
Role of the Project Manager, 1.5 Units

6. Required Certificate Review

Human Resource Management Certificate Completion Fee

Requisite Knowledge

Please review the course descriptions to ensure that you have taken necessary prerequisites or meet the requirements through job experience or previous education.

Recommend Course Sequence

Please follow this sequence

Begin with Human Resource Management, Introduction . After that, courses may be taken in any order.

Substitutions

You may take one elective outside the certificate curriculum, if you receive prior approval from the Academic Services Department.

To receive your certificate

Upon completion of the course sequence you may request your Human Resource Management Certificate Completion Review .

INFORMATION TECHNOLOGY

Cost: $5,700
Required Credits: Total Required: 5–8 courses/14 units. Take 2 core courses - from different tracks (5.5–6 units) and 3-5 elective credit courses (8-8.5 units). End with certificate of completion review.
Duration: A full-time student can complete the certificate in 9–12 months.

Certificate Description

The only Information Technology-specific credential of its kind in Silicon Valley

Choose the IT specialty that fits your career from five tracks of study:

Network Fundamentals

Linux System Administration

DevOps

Data Center Technologies

IT Security Technologies

You can start at the beginning or brush up on the latest security protocols, automation processes, and cloud computing approaches. Study the specialized set of skills that prepare you to use technology to tackle business needs head on.

Information Technology Systems certificate program objectives

Describe the fundamentals of networking protocols, including hardware, cabling, industry standards and connectivity solutions

Design, code, and deploy a cloud-focused tool or application

Differentiate between software-defined data centers (SDDC) and software-as-a-service (SAAS)

Use an Oracle database to design an entity-relationship diagram (ERD) and implement a working database

Understand current security challenges, security models and technologies available to solve these problems

Courses

1. CORE COURSES

Computer Networking Essentials, 3.0 Units
Information Security Essentials, 3.0 Units
Linux System and Network Administration, 3.0 Units
Relational Database Design and SQL Programming, 2.0 Units
System Virtualization Fundamentals, 2.5 Units

2. ELECTIVES

Advanced DevOps Technologies, 3.0 Units

Cloud Computing, Introduction, 0.5 Units
Computer Networking Essentials, 3.0 Units
C Programming for Beginners, 2.0 Units
DevOps Technologies, 3.0 Units
Information Security Essentials, 3.0 Units
IO Concepts and Protocols: PCI Express, Ethernet, and Fibre Channel, 3.0 Units
Java Programming for Beginners, 2.0 Units
LAMP: Linux Based Web Application Development – Apache, MySQL, PHP, 3.0 Units
Linux, Introduction, 2.5 Units
Linux System and Network Administration, 3.0 Units
Linux System Performance in the Cloud and Data Center, 3.0 Units
Linux Systems Programming, 3.0 Units
Mobile e-Commerce, Fintech and Cryptocurrency, 3.0 Units
Programming for Cloud Computing: Amazon Web Services, 3.0 Units
Python for Programmers, 3.0 Units
Python Programming for Beginners, 1.5 Units
Relational Database Design and SQL Programming, 2.0 Units
Software Development Standards, Quality and Customer Experience Measurement, 2.0 Units
Software Value Engineering, Monetization Methods, Techniques & Industry Practice, 2.0 Units
Storage Technology in Data Centers, 3.0 Units
Switching and Routing, 3.0 Units
System Virtualization Fundamentals, 2.5 Units
TCP/IP Essentials, 2.0 Units
Wireless Communications and Mobile Antenna Design, Introduction, 3.0 Units

3. REQUIRED CERTIFICATE REVIEW

Information Technology Certificate Completion Fee

Requisite Knowledge

Please review the course descriptions to ensure that you have taken necessary prerequisites or meet the requirements through job experience or previous education. Students enrolled in this program are expected to be familiar with web and internet infrastructure. You should have basic knowledge of computer networking and communications and be familiar with at least one modern computer operating system.

Recommend Course Sequence

For those new to IT, we recommend that you begin with one of the **Network Fundamentals** courses, such as Computer Networking Essentials or TCP/IP Essentials . Each advanced course has specific prerequisites that you should consider before enrolling. Although not required, students should consider taking all fundamental courses to gain a solid understanding of the entire industry.

Follow your interest

You are welcome to take a deep dive into one of the five identified tracks of study. For those on the **Linux Administration** track, the order of the courses as listed is strongly recommended. For those interested in **Data Center Technologies** and **Systems Security**, courses may be taken based on your interests and background.

Network Fundamentals

. Computer Networking Essentials (**CORE**) (3.0)
• . Switching and Routing, (3.0)
• . TCP/IP Essentials, (2.0)

• . Wireless Communications and Mobile Antenna Design, Introduction, (3.0)

Linux System Administration

Linux, Introduction (2.5)
• Linux System and Network Administration (**CORE**) (3.0)
• Relational Database Design and SQL Programming (**CORE**) (3.0)
• Linux System Performance in the Cloud and Data Center (3.0)
• Linux Systems Programming (3.0)
• Python for Programmers (3.0)

Data Center Technologies

. System Virtualization Fundamentals (**CORE**) (2.5)
• . Storage Technology in Data Centers, (3.0)
• . Cloud Computing, Introduction (0.5)
• . Programming for Cloud Computing: Amazon Web Services (3.0)
• . IO Concepts and Protocols: PCI Express, Ethernet, and Fibre Channel (3.0)

DevOps

Devops Technologies (3.0)
• Advanced Devops Technologies (3.0)
• Software Development Standards, Quality and Customer Experience (2.0)
• Software Value Engineering, Monetization Methods, Techniques & Industry Practice (2.0)

Systems and Internet Security

Information Security Essentials (**CORE**) (3.0)
• Mobile Payments, e-Commerce Security, and Cryptocurrency (3.0)

Related Electives

C Programming for Beginners (2.0)
• Python Programming for Beginners (1.5)
• Java Programming for Beginners, (2.0)
• LAMP: Linux Based Web Application Development - Apache, MySQL, PHP (3.0)

Substitutions

You may take one elective outside the certificate curriculum, if you receive prior approval from the Academic Services Department.

To receive your certificate

Upon completion of the course sequence you may request your Information Technology Certificate Completion Review.

INSTRUCTIONAL DESIGN

Cost: $4,500
Required Credits: Total Required: 8–9 courses/14 units: Take 4 required courses (6 units) and 4–5 elective credit courses (8–9 units). End with certificate of completion review.
Duration: A full-time student can complete the certificate in 9–12 months.

Certificate Description

Deliver great learning

The rapidly growing field of instructional design needs qualified people to organize and deliver learning that effectively serves diverse learning styles and organizational goals. This certificate focuses on the principles and practices of traditional settings in K-12 classrooms, colleges, universities, and professional training settings in corporations and government.

Our instructors model the best of instructional design, starting with assessments of each participant's needs so they can coach you toward the next developmental stage. As a student, you will develop and expand existing skills, build on natural talents and strengths, and learn from assessments any areas in need of special attention. Throughout the program, participants build practical approaches in the following areas:

Online learning

Facilitation

Emerging technologies

Intercultural communication

Curriculum and training vendor evaluation

If you are interested in developing a cultural proficiency course, learning to teach online, or polishing up on current learning theories and styles, the Instructional Design and Delivery program has both individual courses and a certificate program that lays the foundation for a fulfilling and successful instructional design career.

Courses

1. Required Courses

Cultural Proficiency, 2.0 Units
Instructional Design and Delivery, Introduction, 1.0 Units
Learning Theories and Styles, 1.0 Units

2. Elective Courses

Building Online Learning Communities, 2.0 Units
Designing Online Instruction, 2.0 Units
Designing Training Programs, 2.0 Units
Facilitation Skills, 2.0 Units
Instructional Needs Assessment and Evaluation, 1.5 Units
Introduction to Online Teaching, 2.0 Units
Role of the Project Manager, 1.5 Units

3. Capstone Course

Instructional Design and Delivery, Practicum, 2.0 Units

4. Required Certificate Review

Instructional Design Certificate Completion Fee

Requisite Knowledge

Ground your instructional design in practical skills Learn to serve different learning styles. Our instructional design students learn to organize and deliver information to meet organizational goals for all ages and environments—from kindergarten and college to government and corporate training programs. Explore new approaches to online learning, facilitation, the use of emerging technologies, intercultural communication, and the evaluation of curriculum and training vendors. Instructional Design and Delivery certificate program objectives: Plan and implement assessment and evaluation as they play out in corporate training and university settings Understand the principles of visual design Develop a training program or event Design online courses and build online communities Manage projects and facilitate group conversations

Recommend Course Sequence

Flexible course sequence

Courses may be taken in any order but your final course should be Instructional Design and Delivery, Practicum .

Substitutions

You may take one elective outside the certificate curriculum, if you receive prior approval from the Academic Services Department.

To receive your certificate

Upon completion of the course sequence, please apply for your Instructional Design Certificate Completion Review .

INTERNET PROGRAMMING AND DEVELOPMENT

Cost: $ 6,000
Required Credits: Total Required: 5– 8 courses/14 units. Take 1 of 3 core course (3 units) and 4–7 elective credit courses (14–16 units). End with certificate of completion review.
Duration: A full-time student can complete the certificate in 9–12 months.

Certificate Description

The nexus of internet development and app programming

We are the one place where internet development and application programming courses are combined in a single, rich curriculum. Choose between six tracks of study:

Working with the web

Java EE framework

JavaScript framework

Windows framework

Open source web framework

Internet programming languages

We train you to work on e-commerce, enterprise applications, interactive websites, and cloud applications, covering all major platforms and frameworks, including Java Enterprise Edition, Microsoft ASP.NET, as well as major open source options, such as LAMP, Ruby on Rails, and MEAN stack. Students study internet programming languages, server development, RIA or dynamic web technologies, and cloud services.

Internet Programming and Development certificate program objectives

Set up e-commerce sites with LAMP

Deploy web systems with Ruby on Rails

Create dynamic web effects with jQuery and AJAX

Master the fundamentals of HTML, Python, Ruby on Rails, C# .NET, JavaScript, PHP or AJAX

Design, code, and deploy a cloud-based tool or application

Develop a test plan and test cases for web applications

Courses

1. CORE COURSES (Choose One)

Developing Enterprise Java Microservices with Spring Boot and Spring Cloud, 3.0 Units
JavaScript and AJAX, Comprehensive, 3.0 Units
LAMP: Linux Based Web Application Development – Apache, MySQL, PHP, 3.0 Units

2. ELECTIVE COURSES: WORKING WITH THE WEB

Cloud Computing, Introduction, 0.5 Units
Designing, Building and Integrating RESTful API, 2.0 Units
Mobile e-Commerce, Fintech and Cryptocurrency, 3.0 Units
Programming for Cloud Computing: Amazon Web Services, 3.0 Units
User Experience Design Fundamentals, 3.0 Units
Web Applications Testing, Comprehensive, 3.0 Units
Web Technologies, Introduction, 1.0 Units

3. ELECTIVE COURSES: JAVA EE FRAMEWORK

Developing Enterprise Java Microservices with Spring Boot and Spring Cloud, 3.0 Units
Java Programming, Comprehensive, 3.0 Units

4. ELECTIVE COURSES: JAVASCRIPT FRAMEWORK

Developing JavaScript-based Rich Web UI with JQuery, 2.0 Units
Introduction to Web Programming: JavaScript and PHP, 2.0 Units
JavaScript and AJAX, Comprehensive, 3.0 Units
Web Application Development Using React, Redux and TypeScript, 2.0 Units
Web Framework Using JavaScript: The MEAN Stack, 3.0 Units

5. ELECTIVE COURSES: WINDOWS FRAMEWORK

C# .NET Programming, Advanced, 3.0 Units
C# .NET Programming, Comprehensive, 3.0 Units

6. ELECTIVE COURSES: OPEN SOURCE WEB FRAMEWORK

LAMP: Linux Based Web Application Development – Apache, MySQL, PHP, 3.0 Units
Responsive Web Design with Open Source Frameworks, 2.0 Units

7. ELECTIVE COURSES: INTERNET PROGRAMMING LANGUAGES

Designing with Cascading Style Sheets: Advanced, 2.0 Units
Designing with Cascading Style Sheets: Fundamentals, 2.0 Units
HTML5: The Living Language, 3.0 Units
HTML Fundamentals, 2.0 Units
Java Programming for Beginners, 2.0 Units
Python for Programmers, 3.0 Units
Python Programming for Beginners, 1.5 Units
XML Essentials, 2.0 Units

8. REQUIRED CERTIFICATE REVIEW

Internet Programming & Development Certificate Completion Fee

Requisite Knowledge

Please review the course descriptions to ensure that you have taken necessary prerequisites or meet the requirements through job experience or previous education. Programming expertise Familiarity with a programming language such as Java, C#, C++ is required. Database experience General knowledge of database, browsers, and the web is assumed.

Recommend Course Sequence

You must complete one of the three core courses. After that, courses may be taken in any order provided the prerequisites are met.

Substitutions

You may take one elective outside the certificate curriculum, if you receive prior approval from the Academic Services Department.

To receive your certificate

Upon completion of the course sequence you may request your Internet Programming & Development Certificate Completion Review.

LINUX PROGRAMMING AND ADMINISTRATION

Cost: $6,000
Required Credits: Total Required: 5–7 courses/14 units. Take 1 of the 3 core courses (3 units) and 4–6 elective credit courses (11–13 units). End with certificate of completion review.
Duration: A full-time student can complete the certificate in 9–12 months.

Certificate Description

Dive into the operating system of choice

To learn about today's servers, network infrastructure, embedded systems, and mobile devices, we offer you two tracks of study and serve beginners to seasoned pros brushing up on skills.

Administrator Track

Get a solid foundation in configuring, operating and administrating these open, multi-user, multi-tasking Linux operating systems.

Development Track

Developers and system programmers teaches how to customize and optimize processes, IOs and kernel modules. Our virtual server courses can also prepare you for VMware professional certification exams.

Linux Programming and Administration certificate program objectives

Configure, operate and program open, multi-user, multi-tasking Linux operating systems

Perform Linux system and network administration

Program new devices, systems or networks operating on Linux

Install, deploy and develop a website using LAMP

Configure and manage multiple VMware ESXi hosts and virtual machines using the vCenter Server

Courses

1. CORE COURSES

LAMP: Linux Based Web Application Development – Apache, MySQL, PHP, 3.0 Units
Linux Kernel Architecture and Programming, 3.0 Units
Linux System and Network Administration, 3.0 Units

2. ELECTIVE COURSES: LINUX SYSTEM ADMINISTRATION

Cloud Computing, Introduction, 0.5 Units
Computer Networking Essentials, 3.0 Units
Linux, Introduction, 2.5 Units
Linux System and Network Administration, 3.0 Units
Linux System Performance in the Cloud and Data Center, 3.0 Units
Storage Technology in Data Centers, 3.0 Units
System Virtualization Fundamentals, 2.5 Units

3. ELECTIVE COURSES: LINUX APPLICATIONS DEVELOPMENT

C++ Programming, Comprehensive, 3.0 Units
C Programming for Beginners, 2.0 Units
LAMP: Linux Based Web Application Development – Apache, MySQL, PHP, 3.0 Units
Python for Programmers, 3.0 Units
Python Programming for Beginners, 1.5 Units

4. ELECTIVE COURSES: LINUX CORE TECHNOLOGY

Embedded Linux Design and Programming, 3.0 Units
Linux Device Drivers, 3.0 Units
Linux Device Drivers, Advanced, 3.0 Units
Linux Kernel Architecture and Programming, 3.0 Units
Linux Kernel Programming, Advanced, 2.5 Units
Linux Systems Programming, 3.0 Units

5. REQUIRED CERTIFICATE REVIEW

Linux Programming and Administration Certificate Completion Fee

Requisite Knowledge

Please review the course descriptions to ensure that you have taken necessary prerequisites or meet the requirements through job experience or previous education.

Recommend Course Sequence

If you have limited or no UNIX or Linux experience, we strongly recommend that you begin with Linux, Introduction .

Linux System Administration

Linux, Introduction (2.5)
• Linux System and Network Administration (**CORE**) (3.0)
• Computer Networking Essentials (3.0)
• Storage Technology in Data Centers (3.0)
• Linux System Performance in the Cloud and Data Center (3.0)
• Cloud Computing, Introduction (0.5)
• System Virtualization Fundamentals (2.5)

Linux Applications Development

LAMP: Linux Based Web Application Development – Apache, MySQL, PHP (**CORE**) (3.0)
• C Programming for Beginners (2.0)
• C++ Programming, Comprehensive (3.0)
• Python Programming for Beginners (1.5)
• Python for Programmers (3.0)

Linux Core Technology

Linux Kernel Architecture and Programming (**CORE**) (3.0)
• Linux Device Drivers (3.0)
• Linux Device Drivers, Advanced (3.0)
• Linux Kernel Programming, Advanced (3.0)
• Linux Systems Programming (3.0)
• Embedded Linux Design and Programming (3.0)

Substitutions

You may take one elective outside the certificate curriculum, if you receive prior approval from the Academic Services Department.

To receive your certificate

Upon completion of the course sequence you may request your Linux Programming and Administration Certificate Completion Review .

MARKETING MANAGEMENT

Cost: $5,000
Required Credits: Total Required: 7–8 courses/14 units. Take 3 courses (6.5 units) of required credit, 4–5 courses (7.5 units) of elective credit. End with certificate of completion review.
Duration: A full-time student can complete the certificate in 9–12 months.

Certificate Description

Silicon Valley-style customer-driven marketing

The days of siloed sales and marketing are over. The buyer is now in control. We teach you the tools you need to succeed in sales and marketing alignment; the fusion of sales, marketing, and social selling; and programmatic marketing and sales. Learn how artificial intelligence can personalize the customer experience. We offer two tracks and a short series award:

Marketing Management

Digital Marketing (includes social media courses)

Social Media Marketing Professional Award.

Marketing Management certificate program objectives:

Create integrated, multi-channel marketing campaigns

Evaluate the success of marketing campaigns based on data

Communicate brand values to diverse audiences

Leverage social media as a selling tool

Courses

1. Required Courses

Implementing Marketing and Sales Strategies, 2.0 Units
Integrated Marketing Communication, 2.5 Units
Principles of Marketing, 2.0 Units

2. Electives: Digital Marketing

Advanced Social Media Marketing: A Practical Approach for Business, 2.0 Units
Application of Social Media for Business Growth, 2.0 Units
Applied Digital Marketing for Business: Tools, Technologies, Techniques and their Applications, 2.0 Units
CRM: Customer Relationship Management, Fundamentals, 2.0 Units
Customer Acquisition 2.0: Strategies, Retention and Win-Back, 1.5 Units
Database Marketing and Social Selling, 1.5 Units
Leveraging Content and Social Analytics, 1.5 Units
Search Engine Marketing, 2.0 Units
Social Media Marketing Fundamentals, 2.0 Units
Web and Mobile Analytics, 1.5 Units

3. Electives: Marketing Management

Business and Professional Writing, 2.0 Units
Consumer Insights: Data Analysis and Interpretation, 1.5 Units
Marketing Operations 2.0: Tactical Discipline to Strategic Vision, 2.0 Units
Positioning and Brand Management, 1.5 Units
Power of Market Research, 2.0 Units
Product Management: Moving the Product to Market, 2.0 Units
Public Relations: Winning the Mindshare Battle, 1.5 Units

4. Required Certificate Review

Marketing Management Certificate Completion Fee

Requisite Knowledge

Please review the course descriptions to ensure that you have taken necessary prerequisites or meet the requirements through job experience or previous education.

Recommend Course Sequence

Get Started

Please begin with Principles of Marketing . After that, courses may be taken in any order provided the prerequisites are met.

Substitutions

You may take one elective outside the certificate curriculum, if you receive prior approval from the Academic Services Department.

To receive your certificate

Upon completion of the course sequence you may request your Marketing Management Certificate Completion Review .

MEDICAL DEVICES

Cost: $7,000
Required Credits: Total Required: 17 units/7 courses. Take 5 core courses (12.5 units) and 2–3 elective credit courses (4.5 units). End with certificate of completion review.
Duration: A full-time student can complete the certificate in 12 months.

Certificate Description

From tongue depressors to Fitbits

The program gives you a foundation to understand the development and commercialization of safe and effective medical devices and in vitro diagnostic devices (IVDs). Students learn to research, design, develop, regulate, test, and market new devices and biologics. Experienced and aspiring medical device professionals will gain insight into the technological, ethical, regulatory, and business aspects of the highly regulated medical device industry.

Medical Device certificate program objectives:

Use nine elements of design control for medical devices

Navigate post-market regulatory requirements for devices

Market medical devices

Decode regulatory compliance, including medical device quality system regulations and ISO 13485

Explore the product development life cycle for medical devices

Set up and implement medical device verification and validation programs

Courses

1. Five Required Courses

Design Control for Medical Devices, 2.0 Units
Human Factors and Usability in Medical Device Development, 2.0 Units
Quality Systems for Medical Devices: FDA QSR and ISO 13485, 2.5 Units
Regulation of Medical Devices and Diagnostics, 3.0 Units
Risk Management for Regulated Industries, 3.0 Units

2. 4.5 Elective Course Units Required

Global Medical Device Submissions and Strategy, 1.5 Units
Medical Device Verification and Validation, 1.5 Units
Mobile Medical Applications, 0.5 Units
Post-Market Regulatory Obligations for Medical Devices, 1.5 Units
Regulation of in vitro Diagnostics in Europe and the US, 2.5 Units
Validating Software for Medical Devices and Emerging Technologies, 2.0 Units
Value-Added Quality Audits, 1.5 Units

3. Fee for Certificate Review

Medical Devices Certificate Completion Fee

Requisite Knowledge

Please review the course descriptions to ensure that you have taken necessary prerequisites or meet the requirements through job experience or previous education. **Statistics Knowledge**: You will need an understanding of statistics for this program. UCSC Extension offers Statistics .

Recommend Course Sequence

Please follow this sequence. Students new to the industry should begin with Quality Systems for Medical Devices FDA QSR and ISO 13485 (formerly Medical Device Quality Systems) followed by Regulation of Medical Devices and Diagnostics . For those with experience in this field, courses can be taken in any order provided the prerequisites are met.

Substitution

An introductory course to medical devices regulation or Medical Devices: Regulatory Strategies and Marketing Pathways taken within the last five years fulfills the requirement of Regulation of Medical Devices and Diagnostics . Also y ou may take one elective outside the certificate curriculum, if you receive prior approval from the Academic Services Department.

Dual Certification & Shared Credit

Learn more for Less: You can complete two bioscience certificate programs at UCSC Extension simultaneously or in sequence with fewer units than if the programs were taken individually. Students pursing two certificates need to:

Complete the total number of units indicated in the table below.

Complete all required courses for both programs.

Count each unit only once.

Select some electives that are common to both programs.

Biotechnology Clinical Trials Medical Devices Regulatory Affairs Bioinformatics Biotechnology 19 units 32 units 31 units 32 units 30 units Clinical Trials 32 units 19 units 31 units 32 units X Medical Devices 31 units 31 units 17 units 31 units X Regulatory Affairs 32 units 32 units 31 units 19 units X Bioinformatics 30 units X X X 16 units

PERSONAL FINANCIAL PLANNING

Cost: $6,000
Required Credits: Total Required: 8 courses (29.5 units)
Duration: A full-time student can complete the certificate in 6–12 months.

Certificate Description

The only CFP™® Board-registered program in Silicon Valley

The only CFP® Board registered program in Silicon Valley. At its core financial planning is about goal setting and practical problem solving. Financial planning helps people plan for common, real-world challenges such as how much to save for retirement, whether or not to pay off a mortgage, and how to ensure college education.

UCSC Extension financial planning students gain a strong foundation in retirement planning, tax planning, risk management, estate planning, and investments that can be applied both personally and in a professional practice. Our training fulfills the educational requirements set by the Certified Financial Planning™ Board.

Upon successful completion of coursework, students may sit for the rigorous CFP® examination. Our program partners with the Financial Planning Association of Silicon Valley providing you with unique networking opportunities in the Silicon Valley Financial advising community.

Personal Financial Planning certificate program objectives:

Understand applied mathematical concepts for financial planning

Identify and solve estate problems from the financial planning perspective

Decode the retirement planning process, including how to determine the adequacy of your client's resources and income

Apply risk management to financial decision-making

Understand the structure, regulation and operation of investment markets

Courses

1. Prerequisite Courses:

Applied Mathematics for Financial Planning, 3.0 Units
Personal Financial Planning, Survey, 4.0 Units

2. Required Courses

Employment Benefits and Retirement Planning in Personal Financial Planning, 3.5 Units
Estate Planning, 3.5 Units
Income Taxation in Personal Financial Planning, 3.5 Units
Investments in Personal Financial Planning: Principles and Methods, 4.0 Units
Risk Management in Personal Financial Planning, 3.5 Units

3. Capstone Course

Personal Financial Planning, Practicum, 4.5 Units

4. Required Certificate Review

Personal Financial Planning Certificate Completion Fee

Requisite Knowledge

To pursue a certificate in Personal Financial Planning and take the CFP® examination, you should hold a bachelor's degree in any discipline from an accredited U.S. college or university recognized by the U.S. Department of Education.

Recommend Course Sequence

Please follow this sequence. The two prerequisite courses— Applied Mathematics for Financial Planning and Personal Financial Planning, Survey —must be completed prior to enrolling in the remaining courses. The final course for all candidates is Personal Financial Planning, Practicum .

Program Requirements

You must take all eight courses and attain an overall average of 3.0 to qualify, including a B or better in "Applied Mathematics for Financial Planning," "PFP, Survey" and "PFP, Practicum," and a C or better in each of the other courses.

Course work must be completed within three years of declaring candidacy.

Courses completed more than five years prior to date certificate is issued cannot be used to fulfill requirements.

To receive your certificate. Upon completion of the course sequence, please apply for your Personal Financial Planning Certificate Completion Review .

PROCUREMENT AND SUPPLY CHAIN MANAGEMENT

Cost: $6,000
Required Credits: Total Required: 8 courses/16 units. Take 6 core courses (13.5 units) and 2 elective credit courses (2.5 units)
Duration: A full-time student can complete the certificate in 6–12 months.

Certificate Description

Leadership in strategic, sustainable procurement

Today's supply chain professional ensures that an organization has the resources it needs to accomplish its mission and objectives—from finished goods and raw materials to equipment and services. Our students explore emerging strategies at play in every organization's bottom line. Learn proactive collaboration, negotiation, and the data analytics to support your decisions. Practice continuous process improvement for a path of profitability.

Certificate program learning outcomes

1. The Supply Chain Management Role

Acquire understanding of supply chain management role in an organization through strategic master planning of resources in a supply chain.

2. Concepts of Sustainable Supply Chain Strategies & Data Analytics

Apply principles and concepts of sustainable supply chain strategies and data analytics in the supply chain process.

3. Problem Solving & Communication Skills

Identify the principles of customer and supplier relationship management in supply chains by developing problem solving abilities, critical thinking skills, and the ability to apply effective written and oral communication skills to business situations.

4. Optimizing Supply Chain Operations

Apply logistics and purchasing concepts to improve supply chain operations through principles of quality and lean manufacturing, incorporating complexities of international shipping terms, including transportation law and deregulation.

Courses

1. Required Courses

Effective Procurement Strategies, 3.0 Units
Evolving Role of Supply Chain Management, 1.5 Units
Logistics and Transportation Management, 3.0 Units
Supply Chain Operations Management, 3.0 Units
Sustainable Supply Chain Strategies, 1.5 Units
Technology Impacts in the Supply Chain, 1.5 Units

2. Elective Courses

Business and Professional Writing, 2.0 Units
Business Law and Its Environment, 3.0 Units
Effective Negotiations: Principles, Strategies, and Techniques, 1.5 Units
International Business and the Global Economy, 3.0 Units
Managing Global Supply Chains, 1.5 Units
Outsourcing and Contract Management, 1.5 Units
Role of the Project Manager, 1.5 Units
Supply Chain Decisions and Data Analytics, 2.0 Units

3. Required Certificate Review

Procurement and Supply Chain Management Certificate Completion Fee

Requisite Knowledge

Please review course descriptions to ensure that you have taken necessary prerequisites or meet the requirements through job experience or previous education.

Recommend Course Sequence

Please follow this sequence.

Begin with **Evolving Role of Supply Chain Management .** After that, courses may be taken in any order provided the prerequisites are met.

Substitutions

You may take one elective outside the certificate curriculum, if you receive prior approval from the Academic Services Department.

To receive your certificate

Upon completion of the course sequence you may request your Procurement and Supply Chain Management Certificate Completion Review .

PROJECT AND PROGRAM MANAGEMENT

Cost: $6,000
Required Credits: Total Required: 7 courses/15–17 units. Take 4 core courses (10.5 units) and 3 elective credit courses (4.5–6.5 units)
Duration: A full-time student can complete the certificate in 6–12 months.

Certificate Description

As practiced by Silicon Valley leaders

We teach aspiring and seasoned project and program managers to serve as organizational pace-setters, motivating teams to produce value for all project stakeholders. You will learn the latest principles, practices, processes and tools to quickly originate project plans that:

Establish business needs;

Define products;

Estimate costs and schedules; and

Manage risk.

Study current industry practices including agile and lean project leadership methodologies such as Scrum, Kanban, Scrumban, and the Adaptive Project Framework.

Project and Program Management certificate program objectives

Plan and execute successful projects

Analyze stakeholder's needs and requirements

Enlist and lead successful teams

Assess and manage project risks

Use both traditional waterfall and lean-agile project models

Make informed and profitable project business decisions

Prepare for the Project Management Institute's PMP® exam

Qualify for the internationally recognized Master Project Manager® credential

Courses

1. Required Courses

Project Integration and Risk Management, 3.0 Units
Project Leadership and Communication, 3.0 Units
Role of the Project Manager, 1.5 Units

2. Elective Courses

Achieving Organizational Agility using the Scaled Agile Framework, SAFe©, 1.5 Units

Agile Product Life-Cycle Management (APLM), 1.5 Units
Agile Project Management Using Scrum, 1.5 Units
Clinical Project Management, 2.0 Units
Creating the Successful Team, 1.5 Units
Decision-Making Tools and Techniques, 1.5 Units
Effective Negotiations: Principles, Strategies, and Techniques, 1.5 Units
Extreme-Agile Project Management, 1.5 Units
Lean-Agile Project Management: Achieving Business Value, 1.5 Units
Managing International Projects, 1.5 Units
Managing Projects at Startup Companies, 1.5 Units
Managing Projects with Microsoft Project, 1.5 Units
Managing Software Projects, 1.5 Units
Managing the Development of New Products, 1.5 Units
Outsourcing and Contract Management, 1.5 Units
Principles of Business Analysis, 3.0 Units
Schedule Optimization Techniques for Managers, 1.5 Units

3. Capstone Course

Applied Project Management, 3.0 Units

4. Required Certificate Review

Project and Program Management Certificate Completion Fee

Special Offering

PMP® Examination Preparation: 35 Hour, 3.5 Units

Requisite Knowledge

Please review the course descriptions to ensure that you have taken necessary prerequisites or meet the requirements through job experience or previous education.

Recommend Course Sequence

Please follow this sequence

Begin with Role of the Project Manager . Then you can take Project Integration and Risk Management or Project Leadership and Communication , ending your core requirements with Applied Project Management . Electives may be taken in any order provided the prerequisites are met.

Substitutions

You may take one elective outside the certificate curriculum, if you receive prior approval from the Academic Services Department.

To receive your certificate

Upon completion of the course sequence you may request your Project and Program Management Certificate Completion Review .

REGULATORY AFFAIRS

Cost: $8,000
Required Credits: Total Required: 8–10 courses/19 units. Take 6 core courses (3 designated, plus one each from three categories) (13.5–15.5 units) and 2–4 elective credit courses (5 units). End with certificate of completion review.
Duration: A full-time student can complete the certificate in 9–12 months.

Certificate Description

Medical discovery and commercialization

Students learn the journey of safe and ethical medical device and drug development. You will identify the critical roles in the industry, best practices for product documentation and risk management. Learn industry requirements, federal regulations and audits and global standards. Network with people in the industry.

Regulatory Affairs certificate program objectives

Provide regulatory submissions of drugs and biologics

Differentiate the roles and responsibilities between quality assurance (QA) and quality control (QC)

Understand and apply GXPS (Good Manufacturing Practices (GMPS)/Quality System Regulation) for drugs/biologics/medical devices.

Apply risk management principles to products, processes and services within biomedical industries

Set up and implement medical device verification and validation programs

Courses

1. Total of Six Required Courses. Also, choose 1 course each from A, B and C.

Interacting with the FDA, 1.5 Units
Regulation of Drugs and Biologics, 3.0 Units
Regulation of Medical Devices and Diagnostics, 3.0 Units

2. Required Course (A) Choose 1 of the 2 courses

Design Control for Medical Devices, 2.0 Units
Drug Development Process, 3.0 Units

3. Required Course (B) Choose 1 of the 2 courses

Regulatory Submissions: Devices and Diagnostics, 2.5 Units
Regulatory Submissions: Drugs and Biologics, 2.0 Units

4. Required Course (C) Choose 1 of the 2 courses

Good Manufacturing Practices, 3.0 Units
Quality Systems for Medical Devices: FDA QSR and ISO 13485, 2.5 Units

5. Five Elective Course Units Required

Global Medical Device Submissions and Strategy, 1.5 Units
Good Clinical Practices, 3.0 Units
ICH Quality Guidelines: Intent and Overview, 2.0 Units
Post-Market Regulatory Obligations for Medical Devices, 1.5 Units
Preparing for FDA Inspections and Conducting Sponsor Audits, 1.5 Units
Risk Management for Regulated Industries, 3.0 Units
Validating Software for Medical Devices and Emerging Technologies, 2.0 Units
Value-Added Quality Audits, 1.5 Units

6. Additional Courses of Interest

Clinical Trials Essentials: An Intensive One-Week Course, 3.5 Units
Data Privacy and Security for Healthcare and Biosciences, 1.5 Units

7: Fee for Certificate Review

Regulatory Affairs Certificate Completion Fee

Requisite Knowledge

Please review the course descriptions to ensure that you have taken necessary prerequisites or meet the requirements through job experience or previous education. Students with a basic understanding of the life sciences and strong written and oral communication skills will gain the most from this program.

Recommend Course Sequence

Begin with Quality Systems for Medical Devices FDA QSR and ISO 13485 (formerly Medical Device Quality Systems) or Good Manufacturing Practices , followed by Drug Development Process or Regulation of Medical Devices and Diagnostics . After that, courses may be taken in any order provided the prerequisites are met.

Substitutions

You may take one elective outside the certificate curriculum, if you receive prior approval from the Academic Services Department.

Dual Certification & Shared Credit

Learn more for Less: You can complete two bioscience certificate programs at UCSC Extension simultaneously or in sequence with fewer units than if the programs were taken individually. Students pursing two certificates need to:

Complete the total number of units indicated in the table below.

Complete all required courses for both programs.

Count each unit only once.

Select some electives that are common to both programs.

Biotechnology Clinical Trials Medical Devices Regulatory Affairs Bioinformatics Biotechnology 19 units 32 units 31 units 32 units 30 units Clinical Trials 32 units 19 units 31 units 32 units X Medical Devices 31 units 31 units 17 units 31 units X Regulatory Affairs 32 units 32 units 31 units 19 units X Bioinformatics 30 units X X X 16 units To receive your certificate

Upon completion of the course sequence you may request your Regulatory Affairs Certificate Completion Review .

Also recommended:

Data Privacy and Security for Healthcare and Biosciences , 1.5 units

Clinical Trials Essentials: An Intensive One-Week Course , 3.5 units

SOFTWARE ENGINEERING AND QUALITY

Cost: $5,000
Required Credits: Total Required: 5–8 courses/14 units. Take 1 of the 3 core courses (2–3 units) and 4–7 elective credit courses (11–12 units). End with certificate of completion review.
Duration: A full-time student can complete the certificate in 9–12 months.

Certificate Description

Grow your expertise beyond coding and programming

Our certificate program blends foundation-level coursework in software engineering with the latest developments in software quality, testing, and user experience design.

You will learn to create new products, streamline business processes, design dynamic websites, and navigate relational databases. Three Tracks of Study: Software Engineering; Software QA and Testing; and User Interface Design; plus refresher courses for software professionals.

Software Engineering and Quality certificate program objectives

Use Agile software development techniques and testing methodologies

Apply user-centered design strategies to software and mobile application development

Build and consume JAX-RS services using JSON and XML

Create objects using object-oriented Java programming concepts

Program in C, Java, C++, Perl, and Python

Courses

1. CORE COURSES (Choose One)

Object-Oriented Analysis and Design, 3.0 Units
Software Quality Assurance and Testing, 2.0 Units
User Experience Design Fundamentals, 3.0 Units

2. ELECTIVE COURSES: SOFTWARE ENGINEERING

Advanced DevOps Technologies, 3.0 Units
Computational Intelligence, Introduction, 1.5 Units
Data Structures and Algorithms Using C++, 3.0 Units
Data Structures and Algorithms Using Java, 3.0 Units
Designing, Building and Integrating RESTful API, 2.0 Units
DevOps Technologies, 3.0 Units
Introduction to Machine Learning and Data Mining, 3.0 Units
Object-Oriented Analysis and Design, 3.0 Units
Object-Oriented Development: Architecture and Design Patterns, Advanced, 3.0 Units
Software Development Standards, Quality and Customer Experience Measurement, 2.0 Units

3. ELECTIVE COURSES: SOFTWARE QA AND TESTING

Agile Software Development Using TDD/BDD, 3.0 Units
JUnit Test Framework, 1.5 Units

Software Quality Assurance and Testing, 2.0 Units
Web Applications Testing, Comprehensive, 3.0 Units

4. ELECTIVE COURSES: USER INTERFACE DESIGN

Designing User Experience for Smart Things, Virtual Reality and Wearable Technology, 3.0 Units
Mobile Interface Design, 3.0 Units
User Experience Design, Advanced, 3.0 Units
User Experience Design Fundamentals, 3.0 Units

5. ELECTIVE COURSES: SW REFRESHERS

C# .NET Programming, Comprehensive, 3.0 Units
C Programming for Beginners, 2.0 Units
Introduction to Web Programming: JavaScript and PHP, 2.0 Units
Java Programming, Comprehensive, 3.0 Units
Java Programming for Beginners, 2.0 Units
Managing Software Projects, 1.5 Units
Python for Programmers, 3.0 Units
Python Programming for Beginners, 1.5 Units
Relational Database Design and SQL Programming, 2.0 Units

6. REQUIRED CERTIFICATE REVIEW

Software Engineering and Quality Certificate Completion Fee

7. SPECIAL EVENTS

Creating a Tech Startup: A Silicon Valley Workshop

Requisite Knowledge

Please review the course descriptions to ensure that you have taken necessary prerequisites or meet the requirements through job experience or previous education. **Required**. Experience with a programming language is required as well as a degree in computer science or engineering or equivalent experience in software development, testing, QA, or project management.

Recommend Course Sequence

Flexible course sequence

Courses may be taken in any order provided the prerequisites are met.

Substitutions

You may take one elective outside the certificate curriculum, if you receive prior approval from the Academic Services Department.

To receive your certificate

Upon completion of the course sequence you may request your Software Engineering and Quality Certificate Completion Review .

TECHNICAL WRITING AND COMMUNICATION

Cost: $6,575
Required Credits: Total Required: 10 courses/14.5–18.0 units: Take 7 core courses (12 units) and 3 elective credit courses (2.5–6 units). End with certificate of completion review.
Duration: A full-time student can complete the certificate in 6–12 months.

Certificate Description

Transform jargon into clear communication.

In addition to sharpening your grammar and writing style, our Technical Writing and Communication students learn to translate complex ideas into readable materials such as technical manuals, medical papers and business communications. You will focus on five areas: Technical Communication Fundamentals; Advanced Topics in Communication; Project Leadership; Tools and Technologies; and Engineering Communication. This certificate program offers the latest approaches to information architecture, business communications, and web content management.

Technical Writing and Communication certificate program objectives

Apply technical writing strategies to various types of technical information

Write test cases and work collaboratively on iterative development

Develop information and project plans for technical documentation

Understand human factors and the psychology of users

Decode information architecture and design

Courses

1. Technical Communications Fundamentals

Developing Technical Information from Plan to Completion, 2.0 Units
Grammar and Style for Technical Communicators, 3.0 Units
Technical Communication: An Introduction to the Profession, 1.5 Units
Technical Writers' Workshop, 1.0 Units
Writing Successful Instructions, Procedures and Policies, 1.5 Units

2. Advanced Topics in Communications

Final Project: Preparing Your Job Search, 1.5 Units
Information Architecture and Design Basics, 1.5 Units

3. Elective Courses (choose three)

Building and Maintaining Your Technical Eminence, 1.5 Units
Content Authoring Tools Survey, 1.5 Units
DITA Information Architecture
Graphic Design Fundamentals, 2.0 Units
Human Factors for Technical Communicators, 2.0 Units
Managing Technical Documentation Projects, 1.0 Units
Minimalist Design for Documentation, 0.5 Units
Mobile UA

Role of the Project Manager, 1.5 Units
Usability Testing Documentation, 1.5 Units

4. Required Certificate Review

Technical Writing Certificate Completion Fee

Recommend Course Sequence

Please follow this sequence

Start with Technical Communication: An Introduction to the Profession . You must end with Final Project: Preparing Your Job Search .

Substitutions

You may take one elective outside the certificate curriculum, if you receive prior approval from the Academic Services Department.

To receive your certificate

Upon completion of the course sequence you may request your Technical Writing Certificate Completion Review .

TESOL

Cost: $5,500
Required Credits: Total Required: 27 units. Take 7 courses (23 units) of required credit, 2-4 courses (4 units) of elective credit. End with certificate of completion review.
Duration: A full-time student can complete the certificate in 9–12 months.

Certificate Description

English for a global world

A specialized sequence of courses in linguistics and education prepare instructors to teach immigrants and foreign nationals or travel abroad to teach English. In this program you will learn best practices to teach English to nonnative speakers at all stages of language acquisition, as well as how to communicate effectively with a diverse audience, in terms of culture and nationality. Empower your students—and ultimately yourself.

TESOL certificate program objectives

Assess and evaluate a student's level of English language knowledge.

Teach English grammar and writing to nonnative speakers.

Understand bilingual and English language development.

Address students at all levels of language acquisition and tailor your instruction accordingly.

Courses

1. Required Courses

Assessment, Evaluation and Placement, 2.0 Units
Culture and Cultural Diversity, 4.0 Units
First and Second Language Development, 3.0 Units
Fundamentals of English Grammar for ESL Teachers, 2.0 Units
Language Structure, 3.0 Units
Methodology of Bilingual and English Language Development, 4.0 Units

2. Elective Courses

English As a Second Language Through Music and Movement, 2.0 Units
Instructional Design and Delivery, Introduction, 1.0 Units
Teaching Beginning ESL Students: Principles and Practices
Teaching Grammar, Level II, 2.0 Units

3. Capstone Course

TESOL Practicum, 5.0 Units

4. Required Certificate Review

TESOL Certificate Completion Fee

Requisite Knowledge

Please review the course descriptions to ensure that you have taken necessary prerequisites or meet the requirements through job experience or previous education.

Recommend Course Sequence

Flexible course sequence

Courses may be taken in any order provided the prerequisites are met.

Substitutions

You may take one elective outside the certificate curriculum, if you receive prior approval from the Academic Services Department.

To receive your certificate

Upon completion of the course sequence you may request your TESOL Certificate Completion Review.

USER EXPERIENCE AND WEB DESIGN

Cost: $6,500
Required Credits: Total Required: 7–10 courses/17 units: Take 2 of the 5 core courses and the capstone course (5–7.5 units) and 4–7 elective credit courses (9.5–12 units). End with certificate of completion review.
Duration: A full-time student can complete the certificate in 9–12 months.

Certificate Description

Designing for your users

UCSC Silicon Valley Extension's newly revised, four-track User Experience and Web Design certificate program teaches you to anticipate user needs and design the look and feel of new products that are intuitive and easy to use. Learn customer analytics and behavior by working with a design team of peers. Four tracks:

Visual Design

User Experience Design

Design Implementation

Site Management

User Experience And Web Design certificate program objectives:

Use GIF, JPEG and PNG compressions

Work with color online

Design with HTML, CSS, JavaScript and PHP

Communicate brand values using color, typography, layout and imagery

Launch, build and administer e-commerce sites

Design using the Adobe Creative Cloud suite

Create user interfaces that incorporate wearable technology

Courses

1. Recommended Prerequisites

Adobe Illustrator, Introduction, 1.5 Units
Adobe Photoshop, 3.0 Units

2. Core Courses - Two core courses required

Designing with Cascading Style Sheets: Fundamentals, 2.0 Units
HTML Fundamentals, 2.0 Units
User Experience Design Fundamentals, 3.0 Units
Visual Design for the Interactive Web, 2.5 Units
Website Hosting and Optimization, Introduction, 1.0 Units

3. Elective Courses

Adobe Photoshop, 3.0 Units
Building Customized Websites with Wordpress, 2.0 Units
Designing User Experience for Smart Things, Virtual Reality and Wearable Technology, 3.0 Units
Designing with Cascading Style Sheets: Advanced, 2.0 Units
Designing with Cascading Style Sheets: Fundamentals, 2.0 Units
Graphical Production for the Web, 1.5 Units
Graphic Design Fundamentals, 2.0 Units
HTML5: The Living Language, 3.0 Units
HTML Fundamentals, 2.0 Units
Introduction to Web Programming: JavaScript and PHP, 2.0 Units
Mobile Interface Design, 3.0 Units
Responsive Web Design with Open Source Frameworks, 2.0 Units
User Experience Design, Advanced, 3.0 Units
User Experience Design Fundamentals, 3.0 Units
Visual Design for the Interactive Web, 2.5 Units
Website Hosting and Optimization, Introduction, 1.0 Units
Web Technologies, Introduction, 1.0 Units

4. Capstone Course - Required as last course in certificate

Capstone User Experience Project, 2.0 Units

5. Required Certificate Review

User Experience and Web Design Certificate Completion Fee

Requisite Knowledge

Please review the course descriptions to ensure that you have taken necessary prerequisites or meet the requirements through job experience or previous education. Before you begin the program, it's recommended that you take Adobe Illustrator, Introduction and Adobe Photoshop or have the equivalent knowledge and experience.

Recommend Course Sequence

Flexible course sequence

If you are familiar with Adobe Illustrator and Photoshop products, most courses may be taken in any order is you have prerequisites to each course. Your final course should be the Capstone User Experience Project .

Substitutions

You may take one elective outside the certificate curriculum, if you receive prior approval from the Academic Services Department.

New students should attend the Information Session to receive course sequence information

To receive your certificate

Upon completion of the course sequence you may request your User Experience and Web Design Certificate Completion Review.

VLSI ENGINEERING

Cost: $5,800
Required Credits: Total Required: 5–7 courses/14 units. Take 2 of the 5 core courses (6 units) and 3–5 elective credit courses (8–9 units). End with certificate of completion review.
Duration: A full-time student can complete the certificate in 9–12 months.

Certificate Description

Integrated circuit curriculum

Silicon Valley professionals explore ASIC, semiconductor, EDA, device, and integrated circuits in this program. You can pursue five tracks of study:

Design Methodology

Logic and Functional Design

SystemVerilog and Verification

Physical Design and Timing Closure

Circuit Design

Learn hardware specification, logic design, verification, synthesis, physical implementation, circuit design, integrated circuit product testing, and the latest EDA tools on Linux in our VLSI Lab.

VLSI Engineering certificate program objectives

Implement Verilog modeling of digital logic

Write assertions for formal verification using SystemVerilog

Build an advanced UVM verification environment

Understand IO technologies such as PCI Express, Ethernet and Fibre Channel

Complete practical designs with Xilinx FPGAs

Courses

1. CORE COURSES

Advanced Verification with SystemVerilog OOP Testbench, 3.0 Units
Analog IC Design, Introduction, 3.0 Units
Digital Logic Design Using Verilog, 3.0 Units
Physical Design Flow From Netlist to GDSII, 3.0 Units
Practical DFT Concepts for ASICs: Nanometer Test Enhancements, 3.0 Units

2. ELECTIVE COURSES: DESIGN METHODOLOGY

Developing the Nanometer ASIC: From Spec to Silicon, 2.0 Units
Practical Design with Xilinx FPGAs, 3.0 Units

3. ELECTIVE COURSES: LOGIC & FUNCTIONAL DESIGN

Digital Design with FPGA, 3.0 Units
Digital Logic Design Using Verilog, 3.0 Units
IO Concepts and Protocols: PCI Express, Ethernet, and Fibre Channel, 3.0 Units
Practical DFT Concepts for ASICs: Nanometer Test Enhancements, 3.0 Units

4. Elective Courses: SystemVerilog & Verification

Advanced Verification with SystemVerilog OOP Testbench, 3.0 Units
System and Functional Verification Using UVM (Universal Verification Methodology), 3.0 Units
SystemVerilog Assertions and Formal Verification, 3.0 Units
SystemVerilog Essentials: Functional Verification and Simulation, 1.5 Units

5. ELECTIVE COURSES: PHYSICAL DESIGN & TIMING CLOSURE

ASIC Physical Design, Advanced, 3.0 Units
Physical Design Flow From Netlist to GDSII, 3.0 Units
Timing Closure in IC Design, 3.0 Units

6. ELECTIVE COURSES: CIRCUIT DESIGN

Analog IC Design, Introduction, 3.0 Units
Comprehensive Signal and Power Integrity for High-Speed Digital Systems, 3.0 Units
IO Design Fundamentals, 3.0 Units
Jitter Essentials, 1.5 Units
Wireless Communications and Mobile Antenna Design, Introduction, 3.0 Units

7. ELECTIVE COURSES: RELATED ELECTIVES

Embedded System Hardware Architectures, Introduction, 3.0 Units

8. REQUIRED CERTIFICATE REVIEW

VLSI Engineering Certificate Completion Fee

Requisite Knowledge

Technical expertise You need a degree in a technical field or equivalent knowledge acquired through training and experience in hardware design and development. Experience with UNIX and/or LINUX is required for lab sessions. Knowledge of a programming language such as C, Perl or Bash Shell is helpful. Please review course descriptions Make sure you have taken necessary prerequisites or meet the requirements through job experience or previous education before registering for a course.

Recommend Course Sequence

Beginners should take introductory courses before advanced. If you are pursuing a professional certificate, it is recommended that you take at least one course from the **Design Methodology** track. Other courses can be taken based on your interests and professional levels. Here are the 5 tracks of study:

Design Methodology

Developing the Nanometer ASIC: From Spec to Silicon (2.0)
• Practical Design with Xilinx FPGAs (3.0)

Logic & Functional Design

Digital Logic Design Using Verilog (**CORE**) (3.0)
• Practical DFT Concepts for ASICs: With Nanometer Test Enhancements (**CORE**) (3.0)
• IO Concepts and Protocols: PCI Express, Ethernet, and Fibre Channel (3.0)
• Digital Design with FPGA (3.0)

SystemVerilog & Verification

SystemVerilog Essentials: Functional Verification and Simulation (1.5)
• SystemVerilog for ASIC and FPGA Design (3.0)
• SystemVerilog Assertions and Formal Verification, (3.0)
• Advanced Verification with SystemVerilog OOP Testbench,* (3.0)
• System and Functional Verification Using UVM (Universal Verification Methodology) (3.0)

Physical Design and Timing Closure

Physical Design Flow From Netlist to GDSII (**CORE**) (3.0)
• ASIC Physical Design, Advanced (3.0)
• Timing Closure in IC Design (3.0)

Circuit Design

Low-Power Design of Nano-Scale Digital Circuits,(3.0)
• Analog IC Design, Introduction (**CORE**) (3.0)
• IO Design Fundamentals (3.0)
• Wireless Communications and Mobile Antenna Design, Introduction (3.0)
• Jitter Essentials (1.5)
• Comprehensive Signal and Power Integrity for High-Speed Digital Systems (3.0)

Related Electives

Embedded System Hardware Architectures, Introduction (3.0)
• System Design for Low Power Management (1.0)

Substitutions

You may take one elective outside the certificate curriculum, if you receive prior approval from the Academic Services Department.

To receive your certificate

Upon completion of the course sequence you may request your VLSI Engineering Certificate Completion Review .

AWARDS

LEAN-AGILE PROJECT MANAGEMENT PROFESSIONAL AWARD

Cost: $3,000
Required Credits: Total required: 4 courses or 6 units. Take 2 core courses (3 units) and 2 elective credit courses (3 units).
Duration: A student can complete this professional award in 6 months.

Award Description

Customer-focused project management

Jumpstart your career for todays' rapidly changing organizations with a specialization in Lean-Agile project management methodologies. In this short specialization program, you will learn the current knowledge and practices of Agile product life-cycle management (APLM), including Lean-Agile principles, systems thinking, Scrum and Kanban methodologies, and the Scaled Agile Framework (SAFe©) for Lean Enterprises.

Your new knowledge and skills—including effective customer collaboration, adaptive planning, and leading cross-function teams—will be the essential elements for implementing shorter iterative development cycles with more frequent product releases with higher quality for delighted customers.

Lean-Agile Project Management Professional Award objectives

Apply Lean-Agile principles and mindful practices within the context of the project team and the larger organization;

Originate and evolve iterative release plans, from concept to cash, based on rapid delivery of business value, using stakeholder collaboration, and empowered cross-functional teams practicing real-time continuous improvement; and

Succeed within the Scaled Agile Framework (SAFe©) for Lean Enterprises to achieve organizational-level agility by leading knowledgeably and effectively with enterprise-wide Lean-Agile teams.

Courses

1. Prerequisite Course "Role of the Project Manager" or equivalent work experience.

Role of the Project Manager, 1.5 Units

2. Two Required Courses

Achieving Organizational Agility using the Scaled Agile Framework, SAFe©, 1.5 Units
Agile Project Management Using Scrum, 1.5 Units

3. Two Elective Courses Required

Agile Product Life-Cycle Management (APLM), 1.5 Units
Extreme-Agile Project Management, 1.5 Units
Lean-Agile Project Management: Achieving Business Value, 1.5 Units

4. Enroll in the Award Completion Fee to request your Award once all other requirements have been met.

Lean-Agile Project Management Professional Award Completion Fee

MOBILE APPLICATION DEVELOPMENT PROFESSIONAL AWARD

Cost: $3,000
Required Credits: Total Required: 3–4 courses/8 units.
Duration: A student can complete this professional award in 6–9 months.

Award Description

Push to your creative edge

Our Mobile App Development professional award focuses your development expertise in one of the fastest growing fields in technology. Learn to develop iPad, iPhone, and Android applications, create engaging interface design, explore cloud programming and mobile payment across platforms. A professional award recognizes your experience in this growing industry.

Mobile Application Development program objectives

Create simple iOS native applications for iPhone and iPad

Develop native Android applications using Java

Create an engaging user interface prototype for a mobile app or the Web

Differentiate between mobile payment technologies such as Near Field Communication, secure element, Host Card Emulation, Bluetooth, QR codes, tokens and eWallets■

Create an effective user interface that incorporates wearable technology

Courses

You must successfully complete 8 units from the courses below.

Designing User Experience for Smart Things, Virtual Reality and Wearable Technology, 3.0 Units
Mobile Application Development - Android and iOS, Advanced, 3.0 Units
Mobile Application Development - Android and iOS, Introduction, 3.0 Units
Mobile e-Commerce, Fintech and Cryptocurrency, 3.0 Units
Mobile Interface Design, 3.0 Units
Programming for Cloud Computing: Amazon Web Services, 3.0 Units
Wireless Communications and Mobile Antenna Design, Introduction, 3.0 Units

Enroll in the Award Completion Review to request your Award once all other requirements have been met.

Mobile Application Development Award Completion Fee

Requisite Knowledge

Please review the course descriptions to ensure that you have taken necessary prerequisites or meet the requirements through job experience or previous education. Prerequisite language courses cannot be counted toward the award.

Recommend Course Sequence

Flexible course sequence

Courses may be taken in any order provided the prerequisites are met.

To receive your certificate

Upon completion of the course sequence you may request your Mobile Application Development Award Completion Review.

SOCIAL MEDIA MARKETING PROFESSIONAL AWARD

Cost: $2,700
Required Credits: Total Required: 3 courses (6 units)
Duration: A student can complete this professional award in 6–9 months.

Award Description

Rev up your social media strategy

This is a quick, deep dive into the social media marketer toolbox. Students learn key digital technologies and tools to compete for customers in the digital economy, broaden their online audience, and leverage social media to create measurable business results. Explore how key social media channels, branded communities, blogs, video, and messenger apps fit into B2B and B2C marketing strategies and create a social media marketing plan grounded in analytics. You will learn the best practices of online market research and sponsored content campaigns and understand how social media can add value to particular job functions to exceed performance goals.

Social Media Marketing professional award program objectives

Know your audience

Understand the strengths of major social media channels

Develop your own social media campaigns.

Manage, monitor and analyze your social media presence.

Courses

1. Required Courses

Advanced Social Media Marketing: A Practical Approach for Business, 2.0 Units
Social Media Marketing Fundamentals, 2.0 Units

2. Capstone Course

Application of Social Media for Business Growth, 2.0 Units

3. Required Award Completion Review

Social Media Marketing Professional Award Completion Fee

Requisite Knowledge

Please review course descriptions to ensure that you have taken necessary prerequisites or meet the requirements through job experience or previous education.

Recommend Course Sequence

It is strongly recommended that you take the required courses in this sequence:

Social Media Marketing Fundamentals

Advanced Social Media Marketing: A Practical Approach for Business

Application of Social Media for Business Growth

To receive your certificate

Upon completion of the course sequence you may request your Social Media Marketing Professional Award Completion Review .

PROFESSIONAL AWARD FOR ADMINISTRATIVE PROFESSIONALS

Cost: $3,000
Required Credits: 4 courses/minimum 6.5 units. Take 3 core courses (5 units) and 1 elective credit course (1.5 or 2 units)
Duration: A student can complete this professional award in 6 months.

Award Description

Description holding zone.

Courses

1. Three Required Courses

Business and Professional Writing, 2.0 Units
Business Communications, 2.0 Units
Finance for the Business Professional, 1.0 Units

2. One Elective Course Required

CRM: Customer Relationship Management, Fundamentals, 2.0 Units
Facilitation Skills, 2.0 Units
Public Relations: Winning the Mindshare Battle, 1.5 Units
Role of the Project Manager, 1.5 Units

3. Enroll in the Award Completion Fee to request your Award once all other requirements have been met.

Administrative Professionals Professional Award Completion Fee

SERIES

CPA PREPARATION

Cost: Varies. Based on your course choices.
Required Credits: 36 quarter units of accounting and 36 quarter units of general business courses.
Duration: Most courses take 4–12 weeks to complete.

Series Description

CPA exam preparation courses for your career

Gain theoretical knowledge on complex accounting issues along with best industry practices to remain successful as an accountant. Already an accountant? This comprehensive Certified Public Accountant (CPA) preparation course provide you with the 72 units of accounting and general business credit you need to qualify for the rigorous professional exam. As a CPA, you'll be able to exercise your financial skills in virtually any industry.

Note: This is not a certificate program.

CPA prep course objectives:

Auditing and attestation

Corporate income tax accounting

Business law

Microeconomics

Macroeconomics

Project Management

Marketing

Benefits of becoming a CPA

As a CPA you'll be able to:

Prepare audited or reviewed financial statements and file reports with the Securities and Exchange Commission

Represent clients in front of the Internal Revenue Service

Provide tax services, including federal, state and local tax returns

Provide professional assurance and audit services

Provide assistance supervising and managing an organization's or individual's daily activities, including budgeting, financial planning, and cash management

Courses

Accounting Courses

Accounting Ethics, 4.0 Units

Advanced Accounting, 4.0 Units
Auditing and Attestation, 4.0 Units
Corporate Income Tax Accounting, 4.0 Units
Cost Accounting, 4.0 Units
Financial Statement Analysis, 4.0 Units
Income Tax Accounting, 4.0 Units
Intermediate Accounting I, 4.0 Units
Intermediate Accounting II, 4.0 Units
Introduction to Accounting I: Financial Accounting, 4.0 Units
Introduction to Accounting II: Managerial Accounting, 4.0 Units

Business Courses

Business and Professional Writing, 2.0 Units
Business Law and Its Environment, 3.0 Units
Business Statistics I, 2.5 Units
Business Statistics II, 2.5 Units
Finance for the Business Professional, 1.0 Units
Finance I, Fundamentals, 3.0 Units
Implementing Marketing and Sales Strategies, 2.0 Units
Integrated Marketing Communication, 2.5 Units
Organizational Development and Change, Introduction, 2.0 Units
Power of Market Research, 2.0 Units
Principles of Marketing, 2.0 Units
Project Leadership and Communication, 3.0 Units
Role of the Project Manager, 1.5 Units

Requisite Knowledge

Please review the course descriptions to ensure that you have taken necessary prerequisites or meet the requirements through job experience or previous education.

Recommend Course Sequence

Flexible course sequence. You may follow any course sequence provided prerequisites have been met for each course.

EDUCATIONAL CREDENTIALING

Cost: $370
Required Credits: 2–5 units each
Duration: 4–8 weeks each

Series Description

Stay up to date with your training

UCSC Extension offers two online courses for clearing the preliminary credential required for SB 2042 Multiple Subject and Single Subject. Both courses— Technology in Schools, Introduction (SB 2042 Standard 11) ; and Becoming a Professional Educator: Special Populations and Healthy Environments —comply with California Commission on Teacher Credentialing (CCTC) standards.

Courses

1. Required Courses

Becoming a Professional Educator: Special Populations and Healthy Environments, 5.0 Units
Technology in Schools, Introduction (SB 2042 Standard 11), 2.0 Units

HAZWOPER

Cost: $265 per course
Required Credits: Available units & CEUs vary.
Duration: 1-day refresher & continuing education courses

Series Description

Best practices for environmental health

We offer the latest safety and health information from industry experts in hazardous waste operations, environmental health and safety training, certification, and refresher courses.

Courses

HAZWOPER Refresher & EH&S; One-Day Update Courses

8-Hour Annual HAZWOPER Refresher, 0.8 CEU's
Hazardous Waste Handling and Awareness Training, 0.7 CEU's
Toxics Laws Legislative and Regulatory Update, 0.5 Units

MCLE COURSE

Cost: Varies
Required Credits: Total Required: 25 units (MCLE hours)
Duration: Most courses take 4–10 weeks to complete.

Series Description

Learn the business of a law practice

Learn to manage general business issues that attorneys encounter in finance, accounting, business administration, and human resources. We offer a number of practical business-related courses to help you strengthen your business while earning California Bar-required Minimum Continuing Legal Education credit. From accounting to social media marketing, finance and labor issues—our economical “MBA in brief” for attorneys meets your goals and time constraints.

MCLE program objectives

Maintain your status as a practicing attorney in the state of California pursuant to State Bar standards

Handle the accounting and finances of your practice

Understand the role of marketing and its effect on client acquisition and retention

Manage basic human resource functions

Courses

Accounting

Business Statistics II, 2.5 Units
Financial Statement Analysis, 4.0 Units
Introduction to Accounting I: Financial Accounting, 4.0 Units
Introduction to Accounting II: Managerial Accounting, 4.0 Units

Finance

Estate Planning, 3.5 Units
Finance for the Business Professional, 1.0 Units
Finance I, Fundamentals, 3.0 Units

General Business Administration

Business Law and Its Environment, 3.0 Units
Principles of Marketing, 2.0 Units
Social Media Marketing Fundamentals, 2.0 Units

Human Resources Management

Law and Human Resource Management, 2.0 Units
Terminating and Managing Problem Employees, 0.5 Units
Workplace Investigations, 0.5 Units

Recommend Course Sequence

Flexible course sequence

Courses may be taken in any order provided prerequisites are met.

PARALEGAL STUDIES

Cost: Core: $1,395 • Advanced: $2,100
Required Credits: Core Course: 9 CEUs; Advanced Course: 27 CEUs
Duration: Paralegal Core: Two 7-week intensive sessions

Series Description

Paralegal Course Series and CEUs

We offer two levels of paralegal training to help you gain a comprehensive understanding of the American judicial system—the Paralegal Certificate Course © and the Advanced Paralegal Certificate Course . While not UCSC-designated certificate programs, they are taught through the Center for Legal Studies (CLS), meet state of California paralegal certification requirements, and culminate in a certificate of completion.

Program Overviews

The Foundation: The Paralegal Certificate Course©

In two seven-week intensives—Paralegal I and Paralegal II—CLS instructors will teach you practical skills to assist trial attorneys, interview witnesses, investigate complex fact patterns, research the law, and assist in preparing cases for courtroom litigation.

Paralegal I Objectives

The origins and history of the American legal system

The meaning and application of important legal terminology

Attorney and paralegal ethics

Techniques of jury selection and the jury selection process

How to prepare legal documents including demand letters, pleadings, discovery documents, motions and memos

Significant elements of the substantive law of torts, contracts

The important rules of civil procedure and evidence

How to conduct a legal interview

How to conduct legal investigation

How to conduct legal analysis and perform legal problem solving

Paralegal II Objectives

The importance of precedence

What legal authority is, and which authority is the most important

How to conduct legal research and learn how to use the 4 most effective legal research tools found in virtually every law library

How to Shepardize your authority

How to properly cite your authority

How to conduct computerized legal research used extensively in law offices throughout the country.

Proper and effective legal writing style

The basic documents for several important substantive areas of law

Advocacy techniques for usage in formal or informal settings, and

How to begin your job search and perhaps begin a freelance paralegal business after your education

The CLS Advanced Paralegal Certificate Course

Focus on topics that interest you. You are required to complete six seven-week sessions of Advanced Paralegal course topics to receive a certificate of completion. Please choose from the sessions listed below.

Advanced Legal Research

Alternative Dispute Resolution (Mediation)

Bankruptcy Law

Business Law

Constitutional Law

Criminal Law

Criminal Procedure

Education Law

Estate Planning

Family Law

Immigration Law

Intellectual Property

Real Property Law

Victim Advocacy

Water Law

Courses

Advanced Paralegal Program

Advanced Paralegal Certificate Course, 27.0 CEU's

Core Paralegal Program

Paralegal Core Certificate Course©, 9.0 CEU's

Requisite Knowledge

Please review course descriptions. Without any prior degrees or legal experience, you will need to take both courses and receive a certificate of completion to practice in California. Please visit The Center for Legal Studies for more information on California Business & Professions Code §6450.

Recommend Course Sequence

Begin with Paralegal Core Certificate Course © (Paralegal I & II) Students must successfully complete the core requirements before they take the Advanced Paralegal Certificate Course . Advanced course topics can be taken in any order.

Course Descriptions

21st Century Leadership

1.5 Units

The most visionary leaders of today embrace the complexities of the people who work for them. In this course, students gain new insight into the future of the workplace they learn to be more collaborative and evaluative in their approach. Using a new leadership perspective model, they learn to measure their impact on employees, clients, customers and business partners. They learn to improve performance and add meaning to collaborative work.

8-Hour Annual HAZWOPER Refresher

0.8 CEU's

Professionals who have completed the "40-Hour Hazardous Waste Operations and Emergency Response Training" class must attend an annual eight-hour refresher course. This course is designed to meet the Cal-OSHA GISO 5192 and 29 CFR 1910.120 requirements. Students are required to bring to the class their valid certificate for the "40-Hour Hazardous Waste Operations and Emergency Response Training" or a previous "8-Hour Annual Refresher for Hazardous Waste Operations and Emergency Response Personnel." Professional Credit: CSPs can claim COC points 0.8. This event contains 0.8 CEUs or 8 hours of technical contact time and is eligible for ABIH CM credit.

(5363)

Accounting Certificate Completion Fee

Once all of the certificate requirements have been met and your final grades are posted, please access your Student Portal to enroll in the “Certificate Completion Fee” to begin the review process. Please allow 4-6 weeks to receive your certificate.

Accounting Ethics

4.0 Units

Why is ethics critical in the field of accounting and how do you define morality and differentiate justification from explanation? How will you, as an accountant, base your decisions in a code of ethics in your accounting profession?

In this course on accounting ethics issues, students analyze the role of ethics in today’s accounting profession and how it has played out in current events. Students will discuss classical ethical theory and relate it to the American Institute of Certified Public Accountants (AICPA) Code of Professional Conduct, applying those combined theories and rules to ethical problems accountants encounter in their own practice.

Topics include: What is true disclosure?

Equality vs. equity

Major ethical theories

Cultural relativism and international accounting

Accounting as a profession

Accounting codes of conduct

Rules of the Code of Conduct

The auditing function

The ethics of managerial accounting

Ethics in tax accounting

Achieving Organizational Agility using the Scaled Agile Framework, SAFe©

1.5 Units

Few companies survive without sustainably releasing to market quality, cost-effective products and services ahead of competition. Your future projects will likely bring you to work with lean-agile teams using the SAFe© framework. This Agile class empowers you to practice lean thinking, achieve agility, and be ready to immediately work effectively with SAFe© teams. When you learn scaled agile project management for software development, you help companies develop three times more productively, complete four times faster, and deliver with five times fewer defects. Since 2016, enterprises have adopted SAFe© as the No. 1 approach for scaling agile, ahead of Scrum of Scrums, and well ahead of any other approach. Learn SAFe© to get ahead and stay ahead.

PLEASE NOTE: This course was formerly titled "Practical Introduction to Enterprise Agility Using the Scaled Agile Framework SAFe©."

Note(s): Professional Credit: Project Management Institute--PMP 15 Professional Development Units.

Administrative and Executive Assistant Certificate Completion Fee

Once all of the certificate requirements have been met and your final grades are posted, please access your Student Portal to enroll in the “Certificate Completion Fee” to begin the review process. Please allow 4-6 weeks to receive your certificate.

Administrative and Executive Assistants Practicum

2.0 Units

This final required course in the Administrative and Executive Assistant Program unifies and reinforces all aspects and content explored in the previous courses. You will have the opportunity to interactively explore some of the vital components of this career as you learn how to: Function in a team environment

Lead a team to success

Develop effective conflict management skills

Develop a project

Assess your critical-thinking and planning skills

Prior to enrolling in this class, students must contact the department for approval at extensionprogram@ucsc.edu.

Administrative Professionals Professional Award Completion Fee

Once all of the professional award requirements have been met and your final grades are posted, please access your Student Portal to enroll in the “Administrative Professionals Professional Award Completion Fee” to begin the review process. Please allow 4-6 weeks to receive your certificate.

Adobe Illustrator, Introduction

1.5 Units

Illustrator's vector-based, small graphic format makes it a must for print and Web graphics. This hands-on course introduces the essential features and tools of Adobe Illustrator. Students develop basic competency in the use of this complex software, with emphasis on the Pen tool. Topics include:

Using the Pen tool to draw curved, corner and cusp points

Using templates

Selection techniques

Layers

Color swatches

Transformation tools

Moving dialog boxes

Painting objects

Gradients and blends

Gradient Mesh tool

Transparency

Type basics: point, area, path

Patterns and brushes

Compound paths, masks

Skills Needed: Working familiarity with the Mac and/or Windows operating system including the fundamentals of file management and navigation.

Adobe Photoshop

3.0 Units

Adobe Photoshop image editing is the industry standard for Graphic Designers, Web Designers, User Interface Designers, Administrative Professionals, Artists, Photographers, and Business Professionals to give their images, graphics, and presentations a professional edge. Students are introduced to the dense interface of Photoshop menus, tools, options, panels, and keyboard helpers, insights into how Photoshop “thinks” and much more. Lecture, demonstration, hands-on exercises and troubleshooting are used in a lab setting to provide a broad range of Photoshop skills, foundational concepts and sophisticated techniques for non-destructive editing.

A final project will provide the opportunity to create a piece worthy of inclusion in a professional portfolio.

Topics Include:

Workflow

Image specifications

Creating and refining selections

Photoshop layers panel

Composite images

Adjustment layers

Layer mask

Photoshop

Camera RAW

Photo restoration and portrait enhancement

Skills Needed: Familiarity with Macintosh OS

Advanced Accounting

4.0 Units

Designed for accountants, accounting students, professionals and those preparing for the CPA examination, this course focuses on advanced financial reporting topics that are consistently included on the CPA examination. Topics include: Preparing consolidated financial statements, accounting for intercompany transactions, and accounting for business combinations; Limited tax aspects of consolidated financial statements; Accounting for foreign currency transactions and foreign operations; Segment (line-of-business) reporting, interim (quarterly) financial reporting, and partnerships; Financial and economic analysis using real-world cases and development of Excel spreadsheet skills.

Advanced DevOps Technologies

3.0 Units

As more and more industries use DevOps practices and technologies, the demand for skilled DevOp technologists is skyrocketing. This course builds on the DevOps training in our introductory course, expanding on the methodologies and techniques necessary for students to understand real-world DevOps-based deployments. Through examples and hands-on assignments, students explore core concepts, data center basics, advanced virtual machine and container deployments, container orchestration, cloud-based deployments, automated deployment tools, and system monitoring. Students also work with networking, Bash shell and Python scripting, package installation/management, Linux server configuration, and automated source code control mechanisms. Upon successful completion of this course, students will be able to understand, design, and implement complex deployments within data centers and cloud-based environments. Topics include: Bash and Python scripting, Infrastructure as Code (IaC), Git/GitHub, Microservices, virtual machine configurations using Vagrant, container configuration using Docker, container deployment/orchestration using Docker Swarm and Kubernetes, automated deployments using Terraform, continuous integration and deployment (CI/CD) using Jenkins, cloud-deployments in Amazon Web Services.

Prerequisite(s) Students must understand the topics covered in "DevOp Technologies" or have professional-level experience deploying systems in a data center or cloud and programming experience or a course in Bash scripting or Python.

Advanced Paralegal Certificate Course

27.0 CEU's

In this challenging course designed to meet the requirements of California Business and Professions Code §6450, participants focus on areas of study that interest them most. You will choose six Advanced Paralegal Course topics, gaining expertise that you can apply to your work in the field. Topics include: Advanced Legal Research

Bankruptcy Law

Business Law and Practices

Constitutional Law and Civil Liberties

Criminal Law

Criminal Procedure

Education Law

Estate Planning: Probate, Wills, and Trusts

Family Law

Immigration Law

Intellectual Property

Mediation and Other Forms of ADR Real Property Law

Victim Advocacy

Water Law

Course Structure

Each course topic is a seven-week online session requiring an estimated 45–50 hours of individual study. You may take more than one at a time in any order. When you have successfully completed six course topics, you will receive a certificate of completion from UCSC Extension. Course Materials

Students are required to purchase WESTLAW access for this course directly from The Center for Legal Studies. Learn more about curriculum details and purchase required text books and Westlaw access at www.legalstudies.com , or by contacting CLS at (800) 522-7737 or info@legalstudies.com .

Refund Policy

Students in the Center for Legal Studies program are accountable to the UCSC Extension refund policy and associated fees. Learn more by visiting the UCSC Extension policy section on our website ucsc-extension.edu .

Advanced Social Media Marketing: A Practical Approach for Business

2.0 Units

This course provides a pragmatic approach to achieving measurable marketing goals by using modern social media marketing methods, tools, and platforms. Students will learn how to create a winning social media marketing strategy and executable campaign plan and gain insights into advanced topics such as digital transformation and predictive marketing. Learn the techniques used by Silicon Valley pros to impact the digital buyer cycle, accelerate the sales cycle and nurture leads, exploiting social networks such as LinkedIn, Twitter and Facebook in combination with listening, automation and analytics tools. At the end of this course, you should be able to: Understand the latest digital tools, technologies, and trends Create measurable return on investment with SMART goals and metrics Increase target audience awareness, engagement, and conversion rates Create campaigns with the right mix of owned, earned, and paid media Take legal and privacy considerations into account Comprehend how social media can affect brand reputation Partner with active influencers and employees as brand ambassadors

Emphasis is placed on understanding how social media fits into the overall marketing mix and how it can be used to create results, New skills will be reflected in the social media marketing strategy each student creates and presents.

It is recommended that students have a marketing background, or take "Principles of Marketing" prior to enrolling in this course.

Advanced Verification with SystemVerilog OOP Testbench

3.0 Units

SystemVerilog is the new IEEE-1800 standard combining the hardware description language and hardware verification language. This course focuses on the use of advanced verification features in SystemVerilog. Students will learn the step-by-step processes of creating flexible verification components, which form the basis of modern industry-standard methodologies such as UVM (Universal Verification Methodology). They will also gain experience developing an industrial-strength object-oriented programming (OOP) testbench that is layered, configurable, constrained-random, and coverage-driven. The course starts with a brief review of SystemVerilog language semantics and simulation fundamentals such as event ordering, delta cycles and race conditions, which will then feed into closely related entities in program block, clocking block, and interfaces. Students will learn how to develop a complete verification environment by building flexible testbench components via the use of virtual interfaces, classes, mailboxes, dynamic arrays, and queues, etc. Functional coverage in the form of covergroup, coverpoint, and SystemVerilog Assertion (SVA), will round up the development of a complete verification environment. You will become familiar with the flexibility of an OOP-centric technique, the power of constrained random verification and the use of functional coverage tools to ensure the success of a verification project.

Concepts introduced in class are reinforced in the lab. In addition to in-class hands-on labs and weekly take-home assignments, students will work on a required project to build an advanced OOP testbench and verification environment for a selected application (such as a 10G Ethernet MAC design), with transaction-level and layered architecture. Students will form a project team, create a test plan, develop an OOP-centric verification environment, perform functional coverage, and submit a complete project report. This course builds the foundation for the course "System and Functional Verification Using UVM (Universal Verification Methodology)."

Topics Include:

Event scheduler, delta cycles, race conditions, and related topics in program block, clocking block and SystemVerilog interface

Virtual interface and classes: deployment of classes in OOP Testbench

Stimulus generation technique

Constraint inheritance and constraint layering in OOP testbench

Functional coverage class as a testbench component

Simulation phases

Skills Needed: A course in SystemVerilog and knowledge of VHDL, Verilog, C/C++, and some hardware verification experience. Ability to install and configure open-source software on own computers.

Agile Product Life-Cycle Management (APLM)

1.5 Units

This course introduces the fundamentals and practices of Agile Product Life-cycle Management (APLM).The first half of the course focuses on the roles and responsibilities of product owners (PO). Product owners play critical roles on agile projects, connecting the wants and needs of the customer and the business directly to the development teams in a dynamic and responsive way. The course then emphasizes the product delivery model. In this stage, POs help envision the product, define the minimum marketable features, work with the product backlog, and manage requirements at the team, program, and portfolio levels. Upon completion of this course, you'll be able to manage agile product development teams and customers, create value-driven product release roadmaps and delivery schedules, apply prioritization techniques for selecting the product's minimal marketable features, and support large projects through scaling. Topics include: PO roles and responsibilities Product Delivery Product Ownership Agile PPM Scrum PPM Value-driven product release roadmaps and schedules

Note(s): Professional Credit: Project Management Institute -- PMP 15 Professional Development Units.

Agile Project Management Using Scrum

1.5 Units

This course introduces the principles and practices associated with Agile project management using the popular Scrum framework. We will discuss the project management processes of initiating, planning and executing, as well as monitoring, control and closing, all in the context of Scrum. Theory and real life examples will be used to demonstrate the benefits of the Scrum framework in promoting open collaboration and flexibility in adapting to changing market requirements. Topics include:

History of Scrum Business benefits from using Scrum Scrum process – planning and executing Sprints Scrum roles and their significance Scrum ceremonies Scrum artifacts Scrum example scenarios Scrum culture How to adopt Scrum in an organization

Notes: Professional Credit: Project Management Institute -- PMP 15 Professional Development Units.

Agile Software Development Using TDD/BDD

3.0 Units

An explosive volume of digital technologies, such as big data and cloud computing, have created a dramatic need to understand testing trends used in the software industry. As a result, specialized software development practices such as test-driven development (TDD) and behavior-driven development (BDD) have emerged as integral to Agile software development teams. This course provides an overview of Agile, its focus on writing automated tests that ensure quality, and TDD and BDD, which are used to design requirements and test cases that can be automated in Agile software development. Students learn about testing methodologies including black box and white box testing in Agile/Scrum, Git for version control, GitHub for source code management, xUnit framework-based test automation using Python pyUnit and nose, as well as Selenium WebDriver-based functional test automation. Test coverage concepts, strategies and tools such as coverage are also addressed. By the end of the course, students have hands-on exposure to tools they need to compete for Silicon Valley software jobs.

Students are encouraged to bring laptops to class.

Topics include:

Introduction to agile software development

Software testing fundamentals

Automated unit and functional testing using xUnit frameworks

Test-driven development (TDD)

Behavior-driven development (BDD)

Web-based test automation

Introduction to continuous integration and continuous delivery

Skills Needed: Coding knowledge of any general purpose programming language such as Python, Java, C++, Ruby, or C# is required. Students without prior programming experience in Python are encouraged to go through a quick learning guide such as www.learnpython.org before the first lab starts.

AI-Led Enterprise Transformation: Technologies and Use Cases

0.5 Units

Artificial Intelligence (AI), already pervasive in our environment, is described as “the new electricity” because it is transforming our lives, the economy, academia, and industry. We ask Siri for directions to the nearest charging station and consider products suggested by Amazon Echo. Advanced AI applications include self-driving cars, medical image analysis and diagnoses, and cyber intelligence. Google, Facebook, Microsoft, and IBM have announced that AI is a central component in all of their product development. In this sweeping introductory course, students will study the concepts and technologies that comprise AI, its current applications, and the future of the technology. You will obtain a general understanding of enterprise-grade frameworks such as TensorFlow, Keras, Theano, and applied use cases in machine learning and deep learning environments. You will also build an understanding of 'AI at the edge' applications where a huge number of startups are creating new infrastructure. The class prepares you to pursue our developing AI program series.

Topics Include:

Overview of artificial intelligence, machine learning, and deep learning

The current state of artificial intelligence and machine learning

Applications of artificial intelligence and machine learning

Deep learning: an advancement in AI

The development and deployment processes of AI applications

The technologies behind artificial intelligence and machine learning

Closing the talent gap

Future directions in AI

Industry job opportunities and basic requirements to qualify for these jobs

Analog IC Design, Introduction

3.0 Units

Today's mobile, wireless, and consumer electronics employ ASICs and high integration SOCs (System on Chip) that often include the analog blocks for signal processing and the associated analog-to-digital interface circuits. Most MEMS, sensors, photovoltaic and electro-optical devices also require analog components. Understanding the basics of analog IC is essential for application engineers as well as circuit and system designers in a wide variety of electronic fields. This course introduces analog IC design fundamentals including single/multiple-transistor amplifiers, current mirrors, current/voltage reference, output stages, frequency response, feedback, stability, noise, nonlinearity, and mismatches. Transistor models and CAD tools for analog design will also be covered. Students will gain a basic understanding of analog IC design and become familiar with circuit analysis and simulation tool flow. The fundamentals presented in this course prepare students to tackle advanced analog IC topics such as Op-amp, PLL, ADC and DAC.

Students will have access to simulation and waveform tools to test the performance of analog IC designs in our lab. Upon completion, students will have gained experience with circuit simulation and an in-depth understanding of the basic analog functions in IC.

Topics include:

MOS/BJT fundamentals, large and small-signal model

Single/multi-transistor amplifiers, current mirrors

Differential amplifiers

Frequency response

Op-amp design / compensation

Bandgap/regulator design

Feedback analysis

Noise analysis

Survey of advanced analog ICs: VCO (PLL), sample-and-hold (ADC)

Skills Needed: Basic knowledge of microelectronics circuits, semiconductor devices and physics. Experience with UNIX/Linux systems and commands is required for the lab.

Apache Spark with Scala, Introduction

3.0 Units

Apache Spark is one of the latest data processing engines that can support batch, interactive, iterative and graphing processing. The combination of elegant application programming interfaces (APIs) and a fast in-memory general-purpose cluster computing system makes it a very attractive option for companies to leverage for various data processing needs. It complements Hadoop in big data analytic applications. Apache Spark is written in Scala, a functional programming language. However, its APIs are available in three programming languages: Scala, Java and Python. This course focuses on Spark's API in Scala language only. The course introduces Apache Spark, its architecture, and the execution model. The course includes a short introduction to the functional programming language Scala with basic syntax, case class and collection APIs. You'll learn how to manipulate Apache Spark's programming model, Resilient Distributed Dataset (RDD), through its APIs for data processing, and understand how to build Spark applications with Scala. In addition to batch and iterative data processing, Apache Spark also supports stream processing, which is very important for companies to extract business insight at near real-time. The second half of the course covers stream processing capability and developing streaming applications with Apache Spark.

By the end of the course, you'll have a good foundation in Scala language and a strong understanding of Apache Spark's architecture, execution model and programming model. In addition, you'll be able to manipulate RDDs through Apache Spark's API and develop Apache Spark applications in Scala for batch, interactive and stream processing applications. You should have prior object-oriented programming experience to learn Scala and this course only offers a short introduction to Scala.

Topics include:

Big data processing ecosystem

Introduction to Apache Spark architecture and execution model

Introduction to Scala programming language

Apache Spark programming model with RDD

Data processing with Apache Spark RDD Scala APIs

How to develop Apache Spark applications with Scala

Introduction to streaming processing with Apache Spark

How to develop stream processing applications with Apache Spark

Skills Needed: Programming experience with Java is required. Knowledge of Hadoop is recommended.

Application of Social Media for Business Growth

2.0 Units

This course builds on top of the courses "Fundamentals, Social Media Marketing" and "Advanced Social Media Marketing: A Practical Approach for Business," enabling students to apply the range of their newly acquired social media and marketing skills in a simulated real world environment. Students will expand upon the social media marketing strategies they have created during the "Advanced Social Media Marketing: A Practical Approach for Business" course, adding the depth required to succeed in a Silicon Valley work environment. Emphasis is placed on creating a social media campaign that:

Teaches students to support all of their decisions with facts

Acknowledges the reality of often limited resources and competing priorities

Presents a clear assessment of the best marketing mix without a bias for social media

Demonstrates the application of cutting-edge social media tools, techniques and concepts

Gives students the opportunity to present and defend their ideas in front of a Silicon Valley employer

The course will further hone students' social media marketing proficiency by introducing concepts like cross-platform campaigns, programmatic marketing, as well as the application of social media management tools for teams.

It is recommended that students have a marketing background, or take "Principles of Marketing" prior to enrolling in this courses.

Applied Digital Marketing for Business: Tools, Technologies, Techniques and their Applications

2.0 Units

The Applied Digital Marketing course introduces students to the world of integrated digital marketing. This program provides students with strategic and tactical skills they will need to identify, engage, and develop successful relationships with customers in today's digital environment. The course is designed to explore best practices and practical applications of search (SEO/SEM), display, mobile, video, social media, email (CRM), and the reporting/analytics behind running successful multichannel campaigns.

Applied Mathematics for Financial Planning

3.0 Units

This course covers the basic analytic tools and mathematical techniques used in personal financial planning. The emphasis is on understanding and applying quantitative concepts and techniques such as present/future value analysis, discounted cash flow, internal rate of return, measurements of investment performance, analysis of equities and fixed-income investments using statistical tools, evaluation of mortgages, and cash-flow planning for retirement and education. The course is specifically oriented toward practical problem solving.

Note(s): An HP-12C financial calculator is required.

Applied Organizational Behavior and Coaching

3.0 Units

An evidence-based course that demonstrates how to use scientific, applied, hands-on coaching management concepts on a daily basis to maximize employee performance, Applied Organizational Behavior and Coaching helps to increase leadership skills. The course explains how to use scientific principles of behavior management to accurately measure the rate at which organizational and individual performance increases. Areas important to becoming a better performance and leadership coach include understanding how a manager's daily interactions with employees impact performance, management and employee responsibilities, objectively setting and measuring performance standards that also withstand legal challenge, managing within the law, using emotional intelligence, developing cultural intelligence, and working in international environments. Students will learn how to assess and correct performance behaviors quickly, how to write accurate job descriptions; how to legally manage, appraise and counsel employees, and how to manage employees from different countries. Course material will explain the underpinnings of lean and change processes, and is applicable to profit, non-profit, and governmental organizations.

Applied Project Management

3.0 Units

This is the final course in the certificate program and enables students to apply what they've learned from previously completed project-management courses, by developing a simulated but realistic team project. Students will be given project-management tools to facilitate the development of their project. Emphasis will be placed on practical application of project-management principles, processes, and techniques, including project control, cost management, project tracking, and project outsourcing. Students will also learn how to control project schedules, budgets, and scope, using methods that minimize or completely eliminate "scope creep." Techniques such as fast-tracking, critical-path crashing, stochastic estimating, and exploiting activity lead-lag times will enable students to develop fast, accurate project schedules. In-class exercises and case studies lead students to skills they can take back to work and immediately apply to their own projects. Topics include:

Project portfolio management techniques

How to estimate project costs and forecast investment returns

How to apply cybernetic-control techniques to schedules and budgets

How to use earned-value management (EVM) to track and control projects

How to fast-track and crash the project's critical path

How to use stochastic techniques to ensure accurate project schedules

How to apply project management principles in a simulated team project

Note(s): Project Management Institute--PMP 30 Professional Development Units; HRCI--PHR, SPHR and GPHR general recertification credit 27.5 hours.

Artificial Intelligence, Machine Learning, and the Deep Learning Landscape, Introduction

The Artificial Intelligence (AI) revolution generates a lot of interest and opportunity in the academic and business worlds due to its anticipated impact on the economy. One well-known AI researcher described it as “the new electricity” because it will transform our lives and every industry.

AI is already pervasive in our environment. For example, we ask Siri to get directions to the nearest charging station or we order products through Amazon Echo. The next set of advanced AI applications will include self-driving cars, medical image analysis and diagnosis, cyber-intelligence, and more. Leading companies like Google, Facebook, Microsoft, and IBM are announcing that AI will be a central component in all of their products.

Upon completion of this course, students will understand the concepts and technologies that comprise Artificial Intelligence, the current applications of AI, and the direction in which the field is heading.

Topics Include:

Overview of Artificial Intelligence, Machine Learning, and Deep Learning

The current state of Artificial Intelligence and Machine Learning

Applications of Artificial Intelligence and Machine Learning

Deep Learning: an advancement in AI

The development and deployment processes of AI applications

The technologies behind Artificial Intelligence and Machine Learning

Closing the talent Gap

Future directions in AI

ASIC Physical Design, Advanced

3.0 Units

This lab-based course covers advanced topics of ASIC front-to-back design automation. At 32nm node and below, ASIC physical designers have to face multi-vdd, multi-vt, high power, noise, and an explosion of process design rules—all while accounting for chip reliability. The course further develops the students' advanced ASIC design skills by introducing state-of-the-art EDA back-end design tools and methodology. The course provides a 28nm library for students to practice techniques learned in class. After reviewing the design challenges, the course covers UPF-based synthesis and placement. The instructor will give an example of congestion analysis and reduction, and proceed with detailed route analysis and optimization. Students will learn the Clock Tree Synthesis (CTS) and how to optimize timing sign-off in nanometer technology. The course also introduces the hierarchical design flow, power mesh synthesis, and IR drop analysis. The instructor will share tips from extensive professional experience in ASIC implementation over many generations and will also provide basic scripts to facilitate lab exercises.

Topics include:

Advanced physical design challenges

DC-topo multi-vt/multi-vdd UPF synthesis

Power mesh synthesis and optimization

Placement and IR drop analysis and reduction techniques

Congestion analysis and reduction

CTS analysis and optimization

Detail route analysis and optimization

Sign-off optimization

Hierarchical multi-vt/multi-vdd flow

Skills Needed: Basic knowledge of the backend design flow from netlist to GDSII. Knowledge and hands-on experience with Linux/Unix will be required for lab exercises.

Assessment, Evaluation and Placement

2.0 Units

The expert teacher understands the value of assessment, applies authentic and systematic methods of evaluating learning outcomes and supports a rational student placement system. In this seminar, you'll review the purpose, methods and limitations of assessment, evaluation and placement. You'll gain hands-on practice writing, analyzing and evaluating a variety of test types in TESOL.

Attention Deficit Hyperactivity Disorder (ADHD) in the Classroom

3.0 Units

The average classroom may include several students who exhibit symptoms of Attention Deficit Hyperactivity Disorder (ADHD). Many educators need to build skills to meet the educational needs of these children. This course provides the tools needed to better understand, identify and evaluate the ADHD student. It addresses school-related problems associated with ADHD. In-depth coverage of practical, effective instructional strategies is offered as well as social skills training activities that can be easily incorporated into the regular curriculum. You'll learn how to implement effective classroom behavior management systems.

Auditing and Attestation

4.0 Units

In Auditing and Attestation, students study professional standards and ethics as the foundation for a deep dive into audit evidence and documentation, risk-based audit planning, sampling, and audit reporting. You will have the opportunity to practice audits on financial statement accounts to better understand audit methodologies, processes, and requirements. By the end of the course, you will have a strong understanding of how to perform a financial audit to determine whether statement preparation conforms with generally accepted accounting principles (GAAP) and is presented fairly and free of significant errors.

Becoming a Professional Educator: Special Populations and Healthy Environments

5.0 Units

Meets the California Commission on Teacher Credentialing requirements in (a) healthy environment and special populations for SB 2042 preliminary Multiple or Single Subject. This course offers an overview of the field of special education and the expanded role of the teacher in providing health and substance abuse prevention in the "mainstreamed" classroom.

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Benefits Management: A Comprehensive Study of Employee Benefit Programs

2.0 Units

This course presents a comprehensive view of benefits, including the latest approaches for analyzing and negotiating benefits programs and funding options. A key focus will be developing strategies to reduce healthcare costs. Students will learn to evaluate employee needs and help them better understand and use their coverage.

Topics Include:

Health and welfare plans, including cafeteria plans The Affordable Health Care Act and Covered California Qualified retirement plans such as 401(k) plans Vacation and sick leave programs, incidental benefits Overall benefit cost management

Note(s): HRCI--PHR, SPHR and GPHR general recertification credit, 19.25 hours.

Big Data: Overview, Tools and Use Cases

3.0 Units

Big Data has emerged as a powerful new technology paradigm. To manage the massive data generated by social media, online transactions, Web logs, or sensors, Big Data incorporates innovative technologies in data management (unstructured, semi-structured and structured), processing, real time analytics, and visualization. It is also useful for reporting in circumstances where a relational database approach is not effective or too costly. This course is designed for managers, analysts, architects and developers seeking an understanding of Big Data concepts, the related technology landscape and deployment patterns. The course starts with the evolution, characteristics and significance of Big Data. You will learn data management (acquiring, cleansing and normalizing Big Data) and discuss use cases related to log analytics, fraud detection, social media patterns, call centers and more applications in various industries. The course will introduce the concepts and methodology of NoSQL, a database management system designed to handle Big Data. You will also learn the technology infrastructure, Hadoop, storage, MapReduce and Query (SMAQ) stack, and basic Map/Reduce functionality used in Big Data. The course concludes with a review of Data Visualization Tools (DVT), analytical tools and the deployment patterns used in various industries.

The course offers an overview of the Big Data landscape, tool infrastructure and industrial applications. There will be a final project for students to work in teams and study Big Data solutions for specific industries. Students will primarily be exposed to overview of the tools. Tool usage, programming, algorithms and application development are covered in related courses.

Topics Include:

Big Data concepts and characteristics

Data management in the warehouse and in Big Data

Big Data industrial use cases

Hadoop primer

NoSQL functions and ways of managing data

NoSQL methodology and limitations

Tool chain, Hadoop and SMAQ (Storage, MapReduce and Query) stacks in Big Data

Data discovery and visualization

Advanced analytics

Team projects

Skills Needed: A fundamental understanding of databases, programming and data analytics is strongly recommended.

Biochemistry: An Introduction

3.0 Units

This course covers biochemistry concepts central to the biotechnology industry with an emphasis on the enzymatic and metabolic processes of living systems at the molecular level. Topics include the structure and function of biomolecules including proteins, carbohydrates, lipids and nucleic acids; enzymes and enzyme kinetics; and metabolism, including energy production and storage. The course is beneficial for scientists and non-scientists interested in the critical biochemistry processes underlying core technologies in the pharmaceutical, medical devices, diagnostics, biotechnology and biofuel industries. Skills needed: A college-level chemistry course. Some knowledge of organic chemistry is required.

Bioinformatics Certificate Completion Fee

Once all of the certificate requirements have been met and your final grades are posted, please access your Student Portal to enroll in the “Certificate Completion Fee” to begin the review process. Please allow 4-6 weeks to receive your certificate.

Bioinformatics Tools, Databases and Methods

3.0 Units

Bioinformatics plays a crucial role in the storage, search, and analysis of biomolecular sequence and structure data. A significant amount of data is now available on the web, along with software tools for data search and analysis. It is essential that professionals working with biological sequences or structures in public and private sectors are knowledgeable about these databases and tools.

This practical course introduces the main public domain tools, databases and methods used in bioinformatics, including DNA and protein databases such as Genbank and PBD, software tools such as BLAST, and methods for aligning sequences. Topics include multiple alignment, phylogenetic analysis, microarrays and system biology. The course emphasizes the needs of the user of bioinformatics tools and databases, rather than complex algorithm development and advanced computational methods.

The course includes computer lab exercises and online demonstrations of the various databases and tools on the web. It is intended both for life scientists and computer engineers and is the recommended first course for those wanting to gain skills in bioinformatics.

Biology of Cancer

2.0 Units

Understanding the molecular and cellular basis of cancer is essential for the development of new therapeutic strategies and diagnostic tools. This course explores the basic biology of cancer, including the key cellular processes and players, whose alteration leads to uncontrolled cell proliferation. Topics include the pathology and genetic basis of cancer, the immune system, and the role of infectious agents and environmental carcinogens in the disease process. You'll also discuss emerging therapies and strategies for cancer prevention.

Professional Credit: CA BRN/LVN Credit--Provider #CEP13114.

Biotechnology Certificate Completion Fee

Once all of the certificate requirements have been met and your final grades are posted, please access your Student Portal to enroll in the “Certificate Completion Fee” to begin the review process. Please allow 4-6 weeks to receive your certificate.

Building and Maintaining Your Technical Eminence

1.5 Units

Technical communicators are expected to begin a new job or project and quickly use information development tools and learn the technologies about which they will be writing. This is a challenge since industry technologies are changing at Web speed. How can they learn what is necessary? What is important to know before the new project or job begins?

This course provides an introduction to the latest communicators' tools, concepts and terminology used in the field of computers, both hardware and software engineering. Lecture and group exercises emphasize what employers expect technical communicators to know and what can be learned on the job during the course of a project. Intended for technical writers who are new to the field or those considering this profession.

Computer hardware and software overview Operating system overview and basic UNIX commands Compatibility and standards Networking, the Internet and the Web Basic computer graphics concepts Database concepts Programming languages and concepts Tools and technologies used by technical communicators

Building Customized Websites with Wordpress

2.0 Units

If you have some knowledge of Wordpress HTML code and common HTML tags, you are ready to learn how to plan and set up a customized multi-author Wordpress site, one of the world's most popular open-source platforms. In this course, we'll study how to build an e-commerce store, a nonprofit membership and donation website, an event registration solution, and a site with premium content for members.

Using real cases that guide you through the planning and implementation phases of setting up a customized interactive website, you'll learn to configure menus, add plugins, and customize themes. You will explore different ways to accept payments on your site, focusing on the e-commerce plugin WooCommerce, as well as other payment systems with different capabilities, such as event tickets and learn best practices for managing security, user permissions, content creation, and site management. Finally you'll learn to use Wordpress community resources to troubleshoot problems. Upon completion of the course, you will understand underlying concepts of the platform and be prepared to use it to build a fully functioning interactive website with e-commerce capabilities.

Topics include: Learning the basics of Wordpress technologies and concepts

Learning the CMS building blocks of databases, templates, themes, and plugins

Installing, configuring, and updating core software

Security issues: Protecting your site from hackers

Protecting your site from hackers

Configuring user permissions

Creating, editing, and managing content and products

Configuring and testing payment gateways

Uploading and editing images and embedding multimedia files

Building pages: menus, sidebars, and widgets

Organizing and presenting content and products with categories and tags

Installing and updating modules and plug-ins

Changing site designs using contributed themes

Customizing logos, colors, and typography

Setting up a custom child theme folder

Troubleshooting the "white screen of death" and other common problems

Requirement: An online Wordpress installation is required to complete homework assignments. Free or low-cost options for hosting your Wordpress installation will be discussed in the first class meeting. A wordpress.com account does not meet this requirement..

Skills Needed: Students should understand Wordpress HTML code and identify common HTML tags, such as title, heading and paragraph. The more knowledge of inheritance, CSS, and graphical production techniques you have, the more fun you will have creating custom themes. CSS skills and graphical production techniques involved in creating custom themes will not be covered. Students entering the course without those skills will have to rely on off-the-shelf customizable themes.

Building Online Learning Communities

2.0 Units

The virtual classroom presents unique challenges for instructors who want to create a positive and collaborative learning environment. In this course, you'll learn how to overcome the barriers to interaction and build online communities through activities and assignments that empower the learner and build peer interaction, partnerships, and virtual teams.

Business Administration Certificate Completion Fee

Once all of the certificate requirements have been met and your final grades are posted, please access your Student Portal to enroll in the “Certificate Completion Fee” to begin the review process. Please allow 4-6 weeks to receive your certificate.

Business and Professional Writing

2.0 Units

According to Fortune Magazine, professionals with the best writing skills earn three times more than their least capable peers. This course is designed to improve your skills on how to write effective letters, memos, proposals and other professional documents. It emphasizes planning for audience analysis, effective organization and presentation of information with clarity, simplicity and coherence. Learn the process of writing and the use of concrete tools to improve your business writing. In-class exercises build confidence while homework lets you practice your new skills. The helpful interactive format provides immediate feedback, benefits, and solutions.

Skills Needed: Sound knowledge of English grammar.

Business Communications

2.0 Units

Learn key communication and leadership skills vital to success: listening, storytelling, public speaking, and meeting facilitation, while building confidence and your ability to positively influence others.

Students in this eight-week course will get to practice new communication skills each week, learning through a blend of lecture, video, discussion, immersive group activities, and problem-solving team assignments.

You'll have the opportunity to prepare impromptu speeches, sharpen your listening skills, enhance your credibility, and learn new modes of business communication. Perfect your individual meeting facilitation skills and develop the mental ability to be creative, flexible, and adaptable in real-time. Assignments include reading, researching, and creating content to share in class.

Course Objectives

1. Increase your credibility, raise your visibility, address dissent, recover from a mistake, have difficult conversations, and build a credible reputation.

2. Understand the role of influence, persuasion and power inform relationships and how you can enhance your effectiveness in the workplace.

3. Design and deliver powerful presentations of different types.

4. Think on your feet, get your butterflies to fly in formation and effectively communicate in the moment.

5. Leverage the power of story in your speeches, training, coaching, and one-on- one work with others.

6. Sharpen your listening skills in, one-on-one and in group environments as well as on the phone and in meetings that are live and virtual.

7. Master results-oriented techniques for planning and implementing effective meetings.

8. Unleash your creativity through writing and speaking, and partnering in small and large groups.

Business Economics

2.0 Units

This course provides an overview of the principles and concepts in both microeconomics and macroeconomics. The microeconomic concepts will provide information on economic decision making and operations of the economy at the individual and firm level. The macroeconomic concepts will provide information on the national and global economies.

Skills needed: Elementary Algebra. Advisory: Demonstrated proficiency in English by placement as determined by score on the English placement test OR through an equivalent placement process OR completion of Composition and Reading and Advanced Reading; Intermediate Algebra.

Business Intelligence Solutions

2.0 Units

In this comprehensive course aimed at business intelligence (BI) developers and analysts, students get to review BI tools in a hands-on environment. You will learn to convert relevant information into knowledge that supports better strategic decisions through the exploration of various business intelligence tools capable of integrating multiple data sources, processing data analysis, and building interactive dashboards. You will also work with databases that are often used with data management, reporting, and analytics capabilities. Using the Microsoft BI stack as an example platform, you will learn how to create supercharged pivot tables with Power Pivot, a Microsoft Excel add-in application and a data model that makes Power Pivot perform amazingly fast allowing you to analyze the data in new and interesting ways.

We’ll also use Power Query to do some data munging—shaping, cleaning and transforming data using intuitive interfaces without having to use code. Additionally, we’ll build dashboards, charts, and maps using Power BI, Microsoft’s premiere analytics and reporting tool.

By the end of the course, you will have experience building BI solutions with multiple data sources using popular tools.

Note that while SQL Server experience is not required, the basic concepts of relational database design will not be covered in this course.

Topics include:

Introduction to business intelligence concepts

Survey of tools used in the industry

Introduction to the Power Pivot Data Model Manager

Importing data from different data sources, including SQL Server databases

Using Power Query to clean and transform data

Creating calculations and measures with DAX (Data Analysis Expressions)

Making a dashboard using pivot tables and pivot charts

Building reports and dashboards with Power BI Desktop

Final project, where you will design an interactive dashboard for your personal portfolio

Business Law and Its Environment

3.0 Units

The business environment has become more complex and litigious; therefore, knowledge of general principles of law is more important than ever. This course reviews the American legal process, commercial law and its development, and organizational structures in the context of the managerial challenges in today's highly litigious environment. Instruction incorporates analysis of actual cases, class participation, group projects, lectures and readings. Topics include:

Contracts Negligence Product liability Constitutional law as it applies to business Federal and state civil procedure Torts Business entities, including limited liability companies Uniform Commercial Code Real-property concepts Creditor, debtor and bankruptcy issues Employment discrimination and sexual harassment Law of agency Criminal law An overview of the American legal system.

Note(s): HRCI--PHR, SPHR and GPHR strategic recertification credit, 29.5 hours; MCLE--Minimum Continuing Legal Education State Board of CA, 20.0 hours.

Business Statistics I

2.5 Units

An introduction to the business use of statistical concepts and tools, this course covers the basic concepts of descriptive statistics--such as means and variances, uses of probability, and statistical inference--and their application to business processes and decisions. In addition, the course addresses the use of statistical estimation techniques, decision theory (hypothesis-testing process), and the use of regression and correlation.

Formerly "General Statistics I."

Note(s): Professional Credit: HRCI--PHR, SPHR and GPHR strategic recertification credit.

Business Statistics II

2.5 Units

The second half of the Business Statistics sequence covers the use of statistical data, processes and techniques in marketing, auditing, economics, process improvement and surveys. Participants learn how to select the right statistical tools for various data types, how to state the issues, and how to interpret the results of data analysis. Topics include data collection, probability concepts for count data, discrete probability distributions, distributions of sample statistics and statistical inference for population proportions.

Note(s): Professional Credit: MCLE--Minimum Continuing Legal Education State Board of CA, 25.0 hours. HRCI--PHR, SPHR and GPHR strategic recertification credit, 24.72 hours.

Capstone User Experience Project

2.0 Units

One of the most important ways to impress potential employers is to show strong examples of your user experience projects. This final project course in the certificate program gives you the opportunity to bring all your skills together and create a site or project that demonstrates your abilities. You will seek out your own real-world client and work independently to complete your design project. Your instructors will be available to offer guidance as you carry it out. During this course, you will complete the entire process of analysis, design, development and deployment of a website. Before the first class, you'll prepare a requirements document that defines the client, the site objectives, the users, and the target technology platform. You will receive feedback on your project proposal on the first night of class. Then you will begin to design the information architecture, interface and visual design before implementing the site using HTML5, CSS3, and JavaScript as needed. The course addresses cross-browser compatibility and briefly reviews jQuery and other JavaScript libraries. Because the use of a CMS tool requires advanced skills, you must provide a well-defined need for it in your proposal, and obtain instructor approval before proceeding.

By the conclusion of the course, you will have presented your design and implementation process, and will have produced a fully functional website or a front-end interface for a Web page to add to your portfolio. You can choose from development frameworks such as Bootstrap, Materialize, Foundation or SemanticUI, with guidance from your instructors. Current trends in website design patterns and frameworks will be discussed.

This project course does not repeat instructions of prerequisite courses. You should already have the skills needed to implement your design project.

Topics include:

How to produce a requirements document

How to produce design deliverables

How to produce a website

How to validate a website

Note(s): Students should have server space available for posting their projects.

Skills Needed: To take this course students should already have experience designing Web page or executing user experience design process. Visual design and design implementation courses are strongly recommended. Also required is a code editing tool suitable for Web development, such as TextWrangler, BBEdit, Notepad++, Sublime, Dreamweaver, etc. in order to implement the design and complete the project.

Cellular Biology

3.0 Units

Recent advances in stem cell biology and cancer research illustrate the importance of understanding complex biological processes at the cellular level. This course covers the essential concepts of cellular biology, including the functions of cellular macromolecules, subcellular organization, nuclear control of cellular activity, cell signaling and cancer. You'll also learn the experimental approaches used to explore cellular activities.

Professional Credit: CA BRN/LVN Credit--Provider #CEP13114.

Clinical Data Management

2.0 Units

High-quality clinical data are at the heart of a successful clinical trial. If the data are not complete or do not reflect the actual reported results, the analysis and the conclusions drawn from that analysis may not be reliable. This course provides clinical trial personnel a solid understanding of the steps involved in clinical data management from study site data collection through data extraction for analysis. Topics include:

A planned approach to clinical data management

Basic design and specification of the database and cleaning rules

Required documentation, standard operating procedures (SOPs), and quality control

Compliance with FDA/ICH guidelines

Working with other clinical groups and external contract research organizations (CROs)

Using electronic data capture (EDC)

Data security and confidentiality

At the conclusion of the course, students will write their own data management plan. No previous data management experience is necessary although familiarity with Microsoft Excel is required.

Professional Credit: CA BRN/LVN Credit--Provider #CEP13114.

Clinical Project Management

2.0 Units

This course addresses critical elements in the effective planning and management of clinical trials. Exercises and case studies illustrate how to develop and manage activities, timelines and budgets; examine staffing and resource requirements; and lead and motivate effective teams. Strategic development plans, team and site performance problems, and post-marketing studies are also discussed. This course will benefit clinical research professionals with a solid foundation in drug development, GCP and monitoring who are beginning to manage clinical trials. Skills needed: "Good Clinical Practice" or "Good Manufacturing Practice," and "Drug Development Process." A basic understanding of human subjects protection in clinical research is preferred.

Professional Credit: CA BRN/LVN Credit--Provider #CEP13114.

Note(s): Professional Credit: Project Management Institute--PMP 20 Professional Development Units.

Clinical Research: The Study Site Perspective

1.5 Units

The conduct of clinical research requires effective working relationships between the study sites that execute clinical trials and the sponsors that design the trials and provide product for testing. This course offers practical insight into the clinical research process from the viewpoint of the study site. Lectures and class exercises explore the roles, responsibilities, interactions, and concerns of study site personnel and highlight important differences in perspective between clinical study sites and industry sponsors. Course content applies to all study sites, including academic medical centers, community hospitals, rural clinics, physician private practices, hospital networks, and Phase 1 units. Whether you work at a study site, for a sponsor, or are interested in opportunities at these organizations, this course will provide you with a deeper understanding of the study site's role in clinical research. Topics include:

Types of clinical trials, sponsors and study sites

The study site team's roles and responsibilities

The clinical research team and the study site's relationship with each player

Study site and sponsor expectations

GCPs and essential documents for clinical trials

Study start-up activities

Subject recruitment, screening, informed consent and enrollment

Case report forms and source data/documents, HIPAA/PHI and electronic records

Resources and tools for study site personnel

Professional Credit: CA BRN/LVN Credit--Provider #CEP13114.

Clinical Statistics for Non-Statisticians

2.0 Units

Clinical studies succeed or fail on the strength of their statistics. This course takes a practical approach to address the fundamental statistical concepts essential for non-statisticians involved in clinical research. Through lectures, discussions and in-class exercises, the instructor explores clinical study designs, hypothesis testing, sample size calculations, assumptions, controls, endpoints, data-management principles, data presentations and analysis plans, methods of analysis, and conclusions. You'll learn how to interpret the statistics commonly encountered in clinical research as well as how to communicate effectively with statisticians. The approach is practical, simple and qualitative. No previous background in statistics is required.

Professional Credit: CA BRN/LVN Credit--Provider #CEP13114.

Clinical Trials Design and Management Certificate Completion Fee

Once all of the certificate requirements have been met and your final grades are posted, please access your Student Portal to enroll in the “Certificate Completion Fee” to begin the review process. Please allow 4-6 weeks to receive your certificate.

Clinical Trials Essentials: An Intensive One-Week Course

3.5 Units

Well-planned and well-executed clinical trials are the cornerstones of effective drug and medical device development. Offered in an accelerated format and taught by leaders in the biopharmaceutical industry, this course provides a unique opportunity for professionals from all disciplines to learn about the many facets of clinical trials--the complex process that ensures the safety and effectiveness of medical products. Participants leave the program with an appreciation of the drug and device development process; as well as good clinical practice (GCP) and other regulations (ICH and FDA) that guide the conduct of trials and protect human volunteers. Also covered are clinical trial phases and design strategies; the importance of informed consent and the

role of the IRB; investigator selection and responsibilities; study site management and trial monitoring; statistical data analysis; and regulatory responsibilities and the role of the FDA.

This course benefits anyone working in the biopharmaceutical and medical device industries and the biomedical community who is interfacing with or conducting clinical research, including new clinical research associates and study coordinators, medical directors, physicians, nurses, pharmacists, and other health professionals, biomedical scientists, statisticians and database administrators, and business professionals.

A team of clinical research experts, including many instructors from the UCSC Extension Clinical Trials Design and Management Certificate Program, address the following: Topics include:

Drug and Medical Device Development Processes

Clinical Trial Design

Applied Statistics in Clinical Trials for the Non-Statistician

Regulation of Clinical Research

Roles and Responsibilities of Key Clinical Research Players

Monitoring Clinical Trials

Clinical Data Management

Clinical QA, Auditing and Compliance

GMP and the Transition to Full Scale Manufacturing

Business of Clinical Research

Globalization of Clinical Research

Professional Credit: CA BRN/LVN Credit--Provider #CEP13114.

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Clinical Trials Site Monitoring I

2.0 Units

This course presents the essential elements of monitoring a clinical trial and the interaction between a sponsor and one or more sites during a clinical investigation. The course covers expectations of the FDA, the sponsor, and the site. The process of site selection, budgeting, initiation visits, source documentation, regulatory documentation, and adverse event reporting are additional topics covered. Included in the course are the process of medical record review and maintenance, case report form completion, product accountability, and various tasks associated with different monitoring visits. Professional Credit: CA BRN/LVN Credit--Provider #CEP13114.

Cloud Computing, Introduction

0.5 Units

Cloud computing refers to a set of services that provide companies and application developers with the means to scale their application's resource usage through the Internet on demand. It lowers the IT capital expenditure while giving users and developers many flexibility, performance and reliability advantages. It is an evolving technology with potentially wide-ranging impact to e-commerce and enterprise applications. This course introduces students to the core concepts and technologies involved in cloud computing. Beginning with a survey of technologies deployed by Amazon, Google, Microsoft, and various academic and open-source providers, the instructor moves on to explore how cloud computing services can provide on-demand access to data storage, computing resources, and messaging. Discussions then focus on the enabling technologies that comprise the infrastructure behind a cloud computing service, including Web 2.0, virtualization, grid computing and utility computing. Finally, case studies are used to examine technical-business aspects of cloud computing and highlight recent success stories. Upon completion of this course, students will have a good grasp of the concepts and technologies that comprise cloud computing and insight into the direction the field it is heading.

Topics include:

What is Cloud Computing

Where to get information on Cloud Computing

Who provides Cloud Computing Services: Amazon, Google, Microsoft, Eucalyptus, Nimbus, and others

Cloud Computing Services: storage, cpu's, messaging

Case Studies: Successful usage of Cloud Computing

Enabling Technologies: Web 2.0, virtualization, grid computing

Unresolved issues with Cloud Computing

Skills Needed: A basic understanding of the Internet, databases, messaging and programming experience sufficient to follow code examples.

C# .NET Programming, Advanced

3.0 Units

For students who have learned the basic C# language and the C#.NET integrated development environment, this course provides an opportunity to extend your C# and .NET skills. The instructor covers advanced C# features and programming techniques, including the components of the .NET framework, database connectivity and Web application development. Topics include: Object-oriented programming, multithreaded programming, object serialization, database connectivity, LINQ, manipulating XML, and .NET programming with SQL Server. Students learn how to build Web applications with C# and ASP.NET, and create Windows GUI applications using Windows Presentation Foundation (WPF). Other topics include XAML and C# design patterns.

In this course, students gain strong knowledge of C# features and the use of C# in the .NET framework. Students also learn practical thought processes aimed at producing high quality, professional programming using C# .NET. Topics include:

Object-oriented programming review

Object serialization

Operators and casts

Threading and synchronization

Reflections

Lamdbas, indexers, iterators

Database access, ADO.Net and LINQ

XML handling

Introduction to Windows Presentation Foundation (WPF)

Web application using C# and ASP.Net

Design patterns using C#

C# .NET Programming, Comprehensive

3.0 Units

Microsoft's .NET technology provides a development and deployment standard for distributed, Web-based and Windows applications. The .NET technologies include a common-language runtime engine, support for multiple programming languages, application and component assembly, and deployment. This course is for beginners as well as intermediate programmers. It introduces students to .NET programming using Microsoft's C# programming language and the Visual Studio development environment. The course includes a review of the basic constructs of C# language with detailed explanations of the C# regular expressions, delegates, events, generics and collections. It also covers exception handling, threading and synchronization. Sample applications will be used to illustrate core concepts, and the instructor will present real-world code examples in class.

Upon completing the course, students possess the skills necessary to start developing .NET applications using the C# programming language. C# beginners can start on this course. Topics Include:

C# language basics

Developing and Debugging programs using Visual Studio

Objects and Types

Inheritance and Polymorphism

Arrays

Errors and Exceptions

Strings and Regular Expressions

Generics and Collections

Exceptions, Threading and Security

File input/output

Case Study for Windows Application

Skills Needed: Some programming experience with a high-level language such as C, C++, Java or Visual Basic. C# knowledge is not required.

Communication Skills for Administrative and Executive Assistants

2.0 Units

Strong interpersonal communication skills have a direct effect on the bottom line of any successful organization. When communication flows smoothly and clearly, employees work well together, productivity soars, and profits are realized. Course participants will learn and strengthen strong interpersonal communication skills to enhance productivity within dynamic corporate environments, since all companies are unique. Topics Include:

Understanding and Valuing Differences

The Art of Influence

Resume Writing & Interviewing Skills

Successful Business Relationships

Communicating with Confidence

Conflict Resolution

This course is well suited for individuals already in the role of administrator, those desiring promotion to the executive administrator level, and those wanting to transition to this field. Students will hear from executive administrators for C-level executives of some leading Silicon Valley companies, who will share their real-world experience.

Compensation Management

2.0 Units

This course presents wage theories and practices and their application to problems in business and industry. A workshop approach will be applied to the study of wage survey techniques, job analysis, classification and evaluation, methods of individual wage determination, and incentive plans.

Note(s): Professional Credit: HRCI---PHR, SPHR and GPHR general recertification credit: 19.25 hours.

Comprehensive Signal and Power Integrity for High-Speed Digital Systems

3.0 Units

High-speed signaling technologies with multi-gigabit data transfer rates are critical to high-bandwidth communications. However, the physical limitations of the channel (in board, package, and connector), the transceiver circuits, as well as voltage and timing noises introduced along the signal paths, make the design of high-speed links very challenging. Accurate modeling and analysis of high-speed digital systems requires a good understanding of physical effects and system architecture in order to optimize the design parameters in the channel, transmitter, and receiver subsystems. This course gives students a set of skills for problem solving and strategies that they can use to design successful high-speed systems. This course starts with a comprehensive overview of signal and power integrity analysis for high-speed systems. The instructor promptly moves on to cover the state-of-the art modeling and analysis techniques used in high-speed links. The course introduces accurate interconnect modeling including high frequency and second-order effects, and behavioral modeling of IO and ESD, including IBIS. Students will learn the concepts of equalization design and various signaling techniques (such as differential, NRZ, pulse, multi-level, etc.). At the system level, topics include clocking schemes and timing jitter analysis, as well as power analysis topics such as IR Drop, AC noise, simultaneous switching noise, and decoupling capacitor. The course concludes with a discussion of variations in manufacturing and methods to handle them in simulation and design.

Upon completing the course, students will have a strong understanding of signal and power integrity concepts and terminology. They will acquire the skills to design, model, and analyze high-speed interconnects. They will be able to relate various link blocks and parameters to system performance and make trade off decisions.

Topics include:

An introduction to signal and power integrity in high-speed system design

Modeling and analysis of passive components

I/O driver and receiver modeling

Signaling techniques

High-speed link statistical simulation methods

Equalization

Clocking schemes

Timing jitter and noise

Power supply analysis

Modeling and analysis of process and manufacturing variations

Skills Needed: Students must have a basic understanding of signal integrity, electromagnetic compatibility, printed circuit boards or packages.

Computational Intelligence, Introduction

1.5 Units

Computing professionals are required to solve increasingly complex problems using new algorithms, systems or programming paradigms. Fortunately, "black-box" computational intelligence tools can be configured to allow their application to problems, without the user's intimate knowledge of the low-level details. This course is well-suited to computational professionals who are interested in exploring new techniques for solving problems that are ill-defined, have conflicting constraints, or contain data with high noise levels. Industrial applications can be found in software algorithm development, electronic design automation, data mining, medical diagnosis, and pattern matching, etc. You will learn the strengths and weaknesses of various computational and artificial intelligence (AI) techniques using supplied software.

The course introduces the following topics:

Search spaces and their importance for assessing problem complexity

Evolutionary computation, the fundamental engine behind many AI techniques

Genetic programming with many examples

Neural networks and the iris problem

Swarm intelligence, the power of collective, decentralized systems

Support vector machines demonstration using a popular tool for simple classification

Fuzzy logic, including a solution of the traveling salesman problem

You will learn to solve AI problems using software on a provided bootable USB Stick and learn techniques for representing and structuring real-world problems using AI. By the end of the course, you will understand common algorithms and techniques used to solve real-world optimization problems, and also gain experience applying them to practical problems.

Skills Needed: Experience with a computer programming language and basic algebra skills.

Computer Networking Essentials

3.0 Units

This foundation course covers the concepts and technologies required for understanding today's data voice and video networks. It provides a comprehensive survey of networking standards and protocols used to define, understand and work with a wide range of network topologies such as building or campus networks (LANs), mobile/regional (MANs), and large scale networks such as company Intranets or public Internet.You will also gain a strong foundation in networking protocols,

hardware, cabling, industry standards, and connectivity solutions. Topics include:

Introduction to the OSI and TCP/IP models of Internet-working

Wired and wireless physical network components

Approaches and standards for communications on physical networks

How multiple devices share on a physical network

Switching/routing information on a physical network

Approaches and standards for communications on large scale networks

Defining intra/inter networks

IP protocol for intra/inter networks

End-to-end management of information

Best effort delivery

Reliable delivery

Bridging the gap between networking and programs and people

Network management techniques and technologies

Upon successful completion of this course, you will have the knowledge to move on to more in-depth courses in network engineering. It will also provide a strong base for other courses and IT areas that rely on networks.

Skills Needed: Some experience with computers.

Computer Programming Certificate Completion Fee

Once all of the certificate requirements have been met and your final grades are posted, please access your Student Portal to enroll in the “Certificate Completion Fee” to begin the review process. Please allow 4-6 weeks to receive your certificate.

Consumer Insights: Data Analysis and Interpretation

1.5 Units

Through case studies, this course introduces concepts required to understand consumer data from various sources, including retail, Web, survey, and call center data. You will learn the key strategies and promotions companies use to increase the profitability of their businesses based on consumer feedback data. You will have the opportunity to work on three detailed business case studies. In the final project, you’ll perform a complete analysis of a business case from its inception to execution.

The course utilizes advanced MS Excel skills for data manipulation. Topics include:

Advanced MS Excel skills for data manipulation and analysis Interpreting consumer data and making strategic business decisions Analyzing business case studies. Regression modeling with data Segmentation of customer data

Skills Needed: Basic Mathematics.

Content Authoring Tools Survey

1.5 Units

Tools and technologies change rapidly, and in this course you'll learn the critical transferrable skills needed to evaluate, understand, and quickly learn the basics of the typical authoring tools used by technical communicators. Rather than focus on the details of any one tool, you will have the opportunity to try and learn to assess which of today's most widely used tools are likely to work best for your authoring situation. Through lecture, discussion, demos, and hands-on projects, you will:

Demonstrate the core skills needed to understand and use authoring tools for three key technical communication deliverables: structured documents, online help, and screen-capture video

Understand the key considerations for evaluating tools for each type of deliverable

Develop each type of deliverable through three small projects

Contracting with Contract Research Organizations (CROs)

1.5 Units

Pharmaceutical and biotechnology companies are more and more frequently using the services of contract research organizations (CROs) to access expertise or technology not available in-house for key clinical services in an effort to most effectively use limited resources. This course covers the identification, selection, and management of CROs in the performance of clinical projects. Additional topics include selecting the best CRO for a project, request for proposal (RFP) components, bid review and negotiation, types of agreements, defining roles and responsibilities, managing the work once the contract is signed, including change orders and communication issues. The course is designed for medical monitors, clinical and non-clinical managers, CRAs, project managers, contract managers and others interested in strategies for selecting and effectively working with CROs. Professional Credit: CA BRN/LVN Credit--Provider #CEP13114.

Corporate Income Tax Accounting

4.0 Units

Accountants who understand the complexities of the new tax law and its impact on business will be in high demand in this competitive field. In this introductory corporate tax course we will discuss significant changes to tax law resulting from the Tax Cuts and Jobs Act of 2017, as well as critical federal income tax topics such as incorporation, corporate capital structure, dividends and redemptions, liquidations, and the transfer ability of tax attributes. Also covered are the fundamental legal concepts, statutory provisions, and computational procedures of taxable income and deductions, property transactions, and taxation factors relevant to business decisions. Finally, the S Corporation is explored as an alternative to the regular corporation and other modes of operation.

Cost Accounting

4.0 Units

Getting through the maze of the modern business world takes good decision-making skills and a perspective that includes the whole picture, not just the view right in front of you. This course enables students to find their way through the maze by mastering the necessary skills and concepts. The requirements for cost accounting, the standards used to evaluate cost accounting systems, management uses for cost accounting data and the correct processes for implementing systems form the basis of this course. The generally accepted accounting principles (GAAP) are addressed. Topics Include:

The flow of costs through a firm

The difference between a job order costing system and a process costing system

The use of standard costing and how management uses data

C Programming, Advanced

3.0 Units

C remains one of the most popular programming languages. It is widely available on most, if not all, computing platforms. This language is highly valued for its speed, low-level capabilities and platform independent characteristics. It is also actively used in the development of other languages. This course will broaden your skills as a C language programmer by introducing sophisticated problem-solving techniques, including the advanced use of pointers, abstract data types, data structure concepts and optimization techniques. This course delves into the design, implementation, and use of advanced data structures, based on primitive data types. Students will solidify their understanding of strings, arrays, structures, unions and bit manipulation. Emphasis will be on programming that employs and improves upon a variety of data structures. Through this course, you will learn to write efficient programs by understanding the complexities of various algorithms.

Topics Include:

Data types, variables, operators, and operator precedence

Arrays in general, including two-dimensional and multi-dimensional configurations

Dynamic memory allocation, linked, circular and doubly linked lists

Binary trees in general, including implementation, traversal and drawbacks

Recursions and implementation of recursive algorithms

Huffman algorithm

AVL trees, B trees, and B+ trees

Sort routines, big 0 notation and the complexity of algorithms

Graphs: their traversal and applications

Hashing and hash tables

Skills Needed: Students should have a good understanding of programming using data types such as pointers, control flow, structures and functions.

C++ Programming, Comprehensive

3.0 Units

C++ is a general-purpose object-oriented programming language that offers portability, speed, and modularity, as well as compatibility with C and other languages. Because most automation, embedded applications, gaming, and many large data processing applications are written in C++, it is essential that software developers understand and master it. Hardware engineers are increasingly using C++ and OOP in system verification tasks. This course offers an excellent foundation in developing optimized C++ applications. The participants will learn to write faster and modular code, and the debugging techniques, for real-world applications. There will be assignments and exercises to accompany the lectures. Topics Include:

Principles of object-oriented analysis and design

Stream classes for input/output and to read/write files

User defined data types using structures and classes

Declarations of identifiers, pointers, function pointers and references

Reuse code and extend existing data types through inheritance

Memory management and dynamic array declarations

Create class/function templates and understand STL

Use static member variables and static member functions

Singleton design pattern using static member functions

Declare friend functions and friend classes

Function overloading and operator overloading

Polymorphism concept using virtual function

Understand exceptions handling techniques using try/catch syntax

Note(s): Students must have access to a C++ compiler.

Skills Needed: Experience with a high level programming language such as C. Advanced C programming is recommended.

C Programming for Beginners

2.0 Units

C language is popular for engineering and commercial applications. It allows developers to maintain the structure and portability of a high-level language while having the detailed control, efficiency and speed of an assembly language. C is the leading language used in hardware application and in software compilers, libraries and interpreters. This course gets you started with application development using the C language. The course begins with programming and tools overview. It introduces the functions, data types, input/output, strings, operators, precedence, and expressions. It also demonstrates the use of control statements, arrays, and pointers for problem solving. Students will receive assignments to write non-trivial programs and learn to create modular programs with efficiency and readability. This course will benefit individuals who want to learn C programming language but have little or no programming background. The lectures stress the strengths of C providing students with the means of writing efficient, maintainable and portable code. Each instruction is supplemented with programming exercises.

Topics Include:

Compiling, linking, executing, debugging and running a C Program

Functions, data types

Input and Output, character strings

Arrays

Operators and precedence

Expressions

Control statement

Pointers

Advanced topics

Skills Needed: Technical aptitude and experience with a computer operating system or equivalent knowledge.

Creating a Tech Startup: A Silicon Valley Workshop

Every great idea has a beginning and no one can make it to the top alone. In this highly collaborative, two-session workshop for new entrepreneurs, you will refine your business ideas, develop your product, explore the market, learn to build a team, and explore fundraising strategies. Learn to think like an entrepreneur by identifying and evaluating the best opportunities for creating a tech business and building out principal strategies regarding human, technical, commercial, and financial factors. Refine your elevator pitch. In the final class, you'll get to practice your pitch,

helping you to put your best foot forward.

While open to a broad audience, this course also prepares students to compete in HEROthon, a 40-hour Draper University Hackathon (July 5–7) that aims to get the best ideas in front of VCs. No experience necessary.

Creating the Successful Team

1.5 Units

In this course for technical and non-technical professionals, students learn to establish high-performance teams by exploring the fundamental principles and characteristics that make them effective. By examining what makes individuals standout, you will better understand how to develop and leverage their contributions to a successful project team. The course focuses on key team development skills—trust building, goal setting, role agreement, and how to sustain commitment for the duration of a successful collaborative project. The course also covers how to design and manage virtual teams. Through participating in a virtual team, you will learn to identify and respond to typical challenges, including group meetings and team decision-making. Concepts learned in the course are applicable to building highly effective strategic and tactical teams at all levels of an organization.

Note(s): Project Management Institute--PMP 15 Professional Development Units.

CRM: Customer Relationship Management, Fundamentals

2.0 Units

It is critical that companies provide a consistent experience to their customers across all channels of interactions, and listen and respond to them regardless of time, place and language. This course covers the history of customer relationship management (CRM) and its evolution to customer experience--the business needs that ultimately require an effective CRM strategy, and its accompanying tools and technologies. The course includes case studies and live demonstrations of software solutions. By the end of the course, you will know how to create a CRM strategy for your organization. Topics include:

What is CRM?

How has it evolved over the years into Customer Experience?

How has it evolved over the years into Customer Experience?

The adoption of CRM strategies by organizations

How does CRM affect the marketing, sales and customer support functions?

Key success and failure factors for CRM project implementations?

Role of Social Media in a CRM strategy

CRM tools and technologies

At the conclusion of the course, you should be able to: Describe why CRM is an important part of every organization’s survival strategy

Apply an approach to create a CRM strategy for their organization, regardless of size, industry or geography

Explain how to use industry standard CRM software tools

Cultural Proficiency

2.0 Units

Because Silicon Valley companies draw their workforce from around the globe, both staffers and managers quickly learn that their "default" communication styles aren't always effective. "Dos and don'ts" books about other cultures might be useful in some situations, but most of us need tools for working effectively in a global environment every day. In this highly interactive, practical course, you'll learn how to apply the latest research to intercultural business activities. This course includes studies in the following areas: Competition and teamwork; Feedback and clarification; Appraisal and motivation; Optimal use of time; Coaching employees through cultural transitions; Strategic use of cultural resources. **Topic Include:** Defining cultural proficiency

Developing self-awareness about beliefs, stereotypes, and communication styles

Making observations about self and others that will assist in deeper cultural understanding

Describing the difference between workplace politics and diplomacy

Beginning a practical plan for becoming a more effective communicator

Culture and Cultural Diversity

4.0 Units

What is culture, and how does it affect the way we teach and learn? This course explores various definitions of culture, the impact of culture on everyday life, and the impacts on teaching and learning specifically. You will assume an anthropological view of culture as a phenomenon of learned practices, products and perspectives in a community, rather than isolating perceived cultural groups and analyzing each individually. You will analyze how culture is depicted in fiction and write a social, cultural, and historical analysis of a cultural group in California. By understanding culture and cultural diversity in this way, future and current teachers will expand their ideas of how language, culture, and teaching and learning matter in the classroom and beyond. **Objectives:**

Gain an understanding of culture

Explore the relationship between language, culture, and teaching and learning

Consider real-world examples of how and why complex understanding of culture matter for the classroom

Apply learned principles to explore a community group of your choice

Customer Acquisition 2.0: Strategies, Retention and Win-Back

1.5 Units

What determines whether or not your product proves to be a hit in the marketplace? An excellent customer acquisition strategy that targets the right customers in a cost-effective way is the key. A robust strategy encompasses an end-to-end customer focus: understanding what your target customer really wants, developing products that the target customer will embrace, designing compelling marketing communications, and delivering satisfying customer experiences. The course will cover online and offline measurable marketing techniques to gain awareness, educate prospects, and influence customers' buying behaviors. Numerous real world case studies are presented. Topics include: Gaining insight about customers

Describing the target market

Positioning

Metrics

Advertising

Packaging

Promotions

Distribution strategy

Pricing

Online and offline marketing

How to create acquisition strategy

Word of mouth

Consumer trends

Dashboards and Data Visualization

3.0 Units

This course introduces dashboard and data visualization technologies with a hands-on approach. Dashboard is a presentation of key performance indicators (KPIs) important to an enterprise. Database and data analytics professionals often build, use, and support dashboards. Data visualization is the application of data science to extract intelligence from data sources, often in a graphical format. The course introduces the characteristics of dashboards and the principles of data visualization. It also covers how to select KPIs, identify dashboard content requirements, design

and implement dashboards and scorecards, and apply data visualization techniques. In addition, you will learn how to identify and select the software tools used to create dashboards and their visual content, as well as common mistakes, tips, and best practices relevant to dashboards and data visualization.

You will learn how to choose data sources, extract required data, perform data analysis using an example tool, and visually present the results on a dashboard using tables, charts and maps. As a course project, you will identify and specify dashboard requirements (including selecting the appropriate KPIs), design the dashboard views, reports, layout and navigation, as well as create the dashboard and the data visualizations to be incorporated in it. You will learn new visualization techniques like ‘word cloud’, ‘Sankey dashboards’,’Tooltip visualization’, and about the HYPER data format that enhances performance. In addition to these, you will also learn the newer features of the Tableau software. Your grade will be based on the project, in-class participation, a midterm and a final exam.

Topics Include:

Key performance indicators (KPIs)

Understanding dashboards and scorecards

Data visualization principles

Advanced data visualization techniques

Dashboard planning, design and implementation

Best practices, common mistakes and tips

Identifying and selecting dashboard tools and vendors

Course Note: The Tableau software is available to students for learning purposes only for approximately three months. Students are required to install software on own computers (Windows Vista or newer or Mac OSX 10.8.1 or newer) and are encouraged to bring laptops to class. Also note that this is not a specific tool usage training course. Tableau is introduced as an example tool for data visualization.

Skills Needed: Knowledge of database concepts and any business experience related to decision-making.

Data Analysis, Introduction

3.0 Units

Data analysis is the process of transforming data into useful information to support decision making. It is the foundation for data mining, business intelligence, and predictive analytics. This course presents the tools, techniques and common practices used in the industry, including how to obtain, manipulate, explore, model, simulate and present data. It will help you build the essential technical skills to perform as data analyst or data scientist, and to continue other course studies in the certificate program. The course examines different approaches to a data analysis project, with a

framework for organizing an analytical effort. Popular tools for data analysis, such as R and Python can be used to carry out analysis, but R is used primarily in class instruction and examples. The course covers how to obtain and manipulate the raw data for use, as well as the basic exploratory analysis and common data analytical techniques such as regression, simulation, estimation and forecasting. It includes several graphing and visualization tools to understand the data and to present findings and results.

By the end of the course, you will learn a working framework to approach any data analysis project. You will be able to use R (or Python) to complete a large data analysis project, including a write-up with findings, insights and visuals. All tools used are open sourced.

Topics Include:

Approaches to data analysis: Templates, write-ups and illustrative examples

Overview of tools for data analysis: R, R-Studio (IDE) and comparison with Python

Obtaining data: Finding data sets and Web scraping, file formats

Data manipulation techniques: Data quality, reshaping data, appending and joining data sets

Plotting and visualization: Exploration and presentation

Exploratory data analysis: Visual inspection, descriptive analytics, insights

Estimation techniques: Multiple approaches based on assumptions, sampling basics

Regression models: Simple, multiple and logistic

Analysis report write-up and presentation, including graphs

Simulation techniques: Fitting distributions, simulating stochastic processes

Forecasting methods and applications: Smoothing, moving averages, time series, ARIMA

Skills Needed: Some programming experience is recommended. (R will be covered in class and used in examples, and Python experience can be helpful.) Basic knowledge of probability and statistics is required (at the level of most basic statistics textbooks; see for example).

Database and Data Analytics Certificate Completion Fee

Once all of the certificate requirements have been met and your final grades are posted, please access your Student Portal to enroll in the “Certificate Completion Fee” to begin the review process. Please allow 4-6 weeks to receive your certificate.

Database Marketing and Social Selling

1.5 Units

Income may be lost when marketers fail to track and follow up on customers, and the number of existing customer leads and inquiries can be overwhelming. The explosive growth of social media channels such as Facebook, LinkedIn and Twitter has created a new customer interaction channel that fundamentally affects brands, marketing media plans and campaigns. From lead generation, to retention, to ensuring customer satisfaction, social media channels provide opportunities as well as

risks. You'll learn methods to efficiently track and manage interactions with customers. This course addresses several aspects of the latest social selling techniques and provides practical guidance and examples for the aspiring new-age marketer. Topics include: Social media channels: Reaching and interacting with customers, from early adopters to mainstream users Social network analysis (SNA) tools: Understanding the customer and measuring campaign effectiveness Social customer relationship management (CRM): Augmenting the customer feedback loop Working with large data sets: advanced Excel modeling, business intelligence, and data visualization

Data Modeling, Introduction

2.0 Units

Data modeling defines and applies structure to the information systems in an enterprise. Data stored in various relational databases needs data modeling to depict the relationship between entities in the databases. The models provide pictorial views of how the data flows across the enterprise, departments, or business areas. Before creating a database for any application, you need well-constructed data models to maintain the integrity of data and improve query performance. This course provides in-depth knowledge and hands-on practice in data modeling and design. After introducing the basic concepts and principles, the course addresses data modeling techniques and practices in four modeling areas: conceptual, logical, physical and dimensional. The course first addresses the collection of user requirements, followed by design approaches for logical and physical models. You will study real-world examples of data models for transactional systems, data marts and enterprise data warehouses. Expert instructors will share their practical experiences.

This is a hands-on course using an industry-leading data modeling tool in class. By the end of the course, you will be able to create data models for enterprise applications.

Topics Include:

Overview of data modeling

Principles of data modeling

Types of data modeling: Conceptual, Logical, and Physical

Logical data modeling: Building data models; Cardinality rules; Transformation rules

Physical data modeling: Database standards; Domains and classwords; Roll-ups and roll-downs; Data model repository options

Dimensional data modeling: Star schema modeling; Snow flake modeling

Top ten mistakes to be avoided

Data Privacy and Security for Healthcare and Biosciences

1.5 Units

Many companies in the healthcare and bioscience industries utilize Protected Health Information (PHI) or Personally Identifiable Information (PII) to develop and test products such as medical devices and mobile applications, or to perform other services, including data analysis, on their customer's healthcare related data. This course examines the important data privacy and security issues that govern these industries. You will develop a complete understanding of the regulations

and requirements relevant to your industry and learn how to develop a plan of action for compliance with those standards. Topics include:

Relevant state, national and international data privacy and security regulations, including public and private sector laws and rules

Inappropriate disclosure of PII

Guiding principles for information privacy

Medical device security and privacy

Mobile health (mHealth) security and privacy

PII and PHI

HIPAA and HITECH Act requirements and implementation guidelines

Audit criteria, with particular focus on ONC audits

FTC requirements

HIPAA training and risk analysis requirements

Breach notification requirements and procedures

Upcoming data privacy and security issues and regulations

The skills presented in this course are valuable to any company that deals with healthcare or patient data. It is intended for regulatory, clinical or IT professionals working in healthcare, the biopharmaceutical, mobile health (mHealth), biotechnology, medical device and healthcare startup sectors, and anyone interested in regulatory issues faced by these industries. This is a great opportunity to learn how to develop a plan to make these companies compliant with privacy and security regulations.

Data Structures and Algorithms Using C++

3.0 Units

Most engineers know computer languages, as well as some data structures and algorithms. This may not be enough to write code for a real product. This course covers the use of efficient algorithms with powerful data structures in object-oriented code using the C++ programming language. The course begins with a quick review of C++, moving on to the analysis of complexity of algorithms. Emphasis is placed on common problems, implementation details, examples, and testing throughout the course. Each class session will include lecture and discussion of code. This course prepares students to achieve the skill level of practicing engineers in the software industries. Students write and test approximately 5000 lines of C++ code. Upon completion of this course, students are prepared to improve data structures and algorithms in existing code, as well as write industry standard code for a new product. Topics Include:

A quick review of C++

The importance of algorithms

Introduction to the complexity of algorithms

Dynamic array and stack

Linked lists

Searching and sorting

Hash tables

Heap and binary tree

Graph algorithms using C++ templates

Skills Needed: Working knowledge of C++ is required.

Data Structures and Algorithms Using Java

3.0 Units

There are two sides of a program: data structures, which are used to represent data, and algorithms. While entry-level programmers focus on learning programming languages, today's employers seek professionals who know how to program with high reliability, and with efficiency, in terms of resource and performance. The way you represent a program's data is as central to program design as the algorithm. This course focuses on the use of efficient algorithms with powerful data structures in the Java language—and offers the skills you need to stand out. This course covers data structures such as dynamic array, dynamic string, long numbers, lists, heap, hash, trees and graphs. You will learn to create objects from scratch using object-oriented Java programming concepts, and then build bigger objects using the objects that have already been built and tested. You will write algorithms on these objects using techniques such as recursion, greedy, divide and conquer, back tracking and dynamic programming. The course discusses algorithms such as searching and sorting, union find problems, knapsack problems and NP complete problems. You will also learn to compute the worst case complexity of the algorithms in terms of time and space in order to choose the best techniques, and to ensure that the objects scale with arbitrarily sized inputs.

The course emphasizes common problems and implementation details in Java and does not cover advanced Java features. It provides ample examples and testing of codes.

Topics Include:

Introduction to data structures and algorithms

Review of Java used for this course

Need for algorithms

Complexity of algorithms in terms of time and space

Tools for computing complexity in terms of problem size rather than hardware used

Data structures for building extremely large objects like array, stack, heap, hash, trees and graphs

Algorithm techniques for solving problems like greedy, divide and conquer, back tracking and dynamic programming

Implementing objects and algorithms that scale for arbitrary large size problems

Proving the worst case complexity of each algorithms in terms of time and space

Skills Needed: Working knowledge of Java or C/C++.

Decision-Making Tools and Techniques

1.5 Units

Project managers are, above everything else, decision makers and problem solvers. A project manager's effectiveness is directly proportional to his or her decision-making ability. This course is for those professionals who want to improve their decision-making skills through the use of modern-day computer tools and techniques. Participants learn how to make effective decisions relating to project schedules, product design trade-offs, project cost estimating, problem solving and project risk analyses. Examples, in-class exercises and homework using spreadsheet techniques and Internet tools enable participants to become confident in the use and application of practical decision-making methods. Topics include:

Spreadsheet modeling and decision analysis

Decision tools for project schedule management

How to make multicriteria decisions using the Analytic Hierarchy Process (AHP)

Making effective project cost decisions

How to use computer tools to optimize product designs

Decision trees: when and how to use them

How to make decisions when dealing with schedule and cost uncertainties

How to select the most appropriate decision-making tool

Note(s): Project Management Institute--PMP 15 Professional Development Units.

Deep Learning and Artificial Intelligence with Keras

3.0 Units

Deep Learning is an advancement in machine learning technology that uses neural networks for building prediction models. In this course, students use Keras, an open-source and industry standard library for machine learning developed by François Chollet and officially adopted by

Google as a layer of abstraction on top of TensorFlow.

Keras leverages the power of TensorFlow, which allows distribution of computation across CPUs and multiple GPUs on a single computer—an enhancement that enables development of high-performance prediction models. In this course, students build prediction models of different complexities, from simple linear logistic regression to convolutional neural network (CNN) and recurrent neural network (RNN) with long short-term memory (LSTM). By the end of the class, you'll have a working deep learning environment and sample projects. The class prepares you to pursue a career in data science.

Topics Include:

Deep learning and Keras

Multilayer perceptrons

Advanced multilayer perceptrons

Convolutional neural networks

Recurrent neural networks

RNN - prediction with multilayer perceptron

LSTM - prediction with long short term memory networks

Skills Needed: Moderate level of computer programming ability in Python, comfortable with an editor, familiarity with basic command-line operations on a laptop, and basic understanding of Machine Learning models.

Note(s): Students are required to bring Laptops for classroom work. For best performance: students are asked to reinstall Python 3+ version of Anaconda distribution from https://www.anaconda.com/on their machines, if it is already loaded.

Deep Learning and Artificial Intelligence with TensorFlow

3.0 Units

Deep Learning is an advancement in machine learning technology that uses neural networks for building prediction models. In this course, students use TensorFlow, an open-source and industry standard library for machine learning developed by Google Brain.

TensorFlow allows distribution of computation across CPUs and multiple GPUs on a single computer—an enhancement that enables development of high-performance prediction models.

Students will build prediction models of different complexities, from simple linear logistic regression to convolutional neural network (CNN) and recurrent neural network (RNN) with long Short-term memory (LSTM).

By the end of the class, students have a working deep learning environment and sample projects. The class prepares students to pursue a career in data sciences.

Topics Include:

Deep learning and TensorFlow

Multilayer perceptrons

Advanced multilayer perceptrons

Convolutional neural networks

Recurrent neural networks

RNN - prediction with multilayer perceptron

RNN - prediction with long short term memory networks

Skills Needed: Moderate level of computer programming ability in Python, comfortable with an editor, familiarity with basic command-line operations on a laptop, and basic understanding of Machine Learning models.

Note(s): Students are required to bring Laptops for classroom work. For best performance: students are asked to reinstall Python 3+ version of Anaconda distribution from https://www.anaconda.com/on their machines, if it is already loaded.

Design and Analysis of High-Performance Memory Systems

3.0 Units

To effectively design, analyze and compare different state-of-the-art memory interfaces, students start with an introduction to memory systems in computing devices such as computers, tablets or smartphones. They shift to an in-depth analysis of standard memory systems for low-power and high-performance applications and begin to discuss the interactions between signaling, clocking architecture and packaging technology of a memory interface. Topics include:

Review of the standard memory systems for workstations, desktop, laptop, tablets, and smartphones.

The design challenges of low-power and high-performance memory interfaces

The design and optimization of the signaling and clocking architectures, packaging solutions,

channel, and power distribution system design

The dependence of the memory channels on the system environments

Channel attenuation, dispersion and reflection

The traditional wirebond-based packaging technologies

Advanced 2.5D/3D packaging technologies for memory solutions that use TSV technology and Si/Glass interposer for WideIO1 and WideIO2, hybrid memory cube (HMC) and high bandwidth memory (HBM) technologies are introduced.

Analysis and comparison of different state-of-the-art memory interfaces

Skills Needed: Students must have a basic understanding of digital and analog circuits, signals and systems, computer architecture, and digital communication.

Design Control for Medical Devices

2.0 Units

The successful development of medical devices requires that the design be controlled to ensure product safety and that the device can fulfill its intended use. This course provides a practical understanding of the engineering value of design control throughout the product lifecycle as it pertains to product quality. You'll learn to use the nine elements of design control to make design objectives clearer, products more testable, and to better satisfy customer requirements, thereby shortening the path to product and business success. The course highlights the practical implementation of the design history file, reviews and records, transfer planning, requirements engineering and project planning. You will also learn topics related to design verification and validation testing, such as process validation, biocompatibility, shelf-life, sterilization and packaging validation. **Topics Include:**

Design control, the quality system and ISO 13485: A brief introduction

Design and development planning

Design input, design output

Design review and peer review

Design change control

Design transfer to manufacturing

Design verification

Design validation and use of statistics

Design history file (DHF)

Designing Big Data Applications - Foundations

3.0 Units

Formerly Hadoop: Distributed Processing of Big Data

Big Data platforms are distributed systems that can process large amounts of data across clusters of servers. They are being used across industries in internet startups and established enterprises. In this comprehensive introductory course, you will get up to speed on the use of current Big Data platforms and gain insights into cloud-based Big Data architectures. We will cover Hadoop, Spark and other Big Data platforms based on SQL, such as Hive. The first half of the course includes an overview of the frameworks for MapReduce and Spark. You will learn how to write MapReduce/Spark jobs and how to optimize data processing applications. The second half of the course covers SQL based tools for Big Data. We use Hive to build ETL jobs. The course also includes the fundamentals of NoSQL databases like HBase and Kafka.

The course consists of interactive lectures, hands-on labs in class, and take home practice exercises. Upon completion of this course, you will possess a strong understanding of the tools used to build Big Data applications using MapReduce, Spark, and Hive.

Topics Include:

Big Data applications architecture

Understanding Hadoop distributed file system (HDFS)

How MapReduce framework works

Introduction to HBase (Hadoop NoSQL database)

Introduction to Apache Kafka

Developing MapReduce applications

Introduction to Spark and SparkSQL

Developing Spark/SparkSQL applications

Managing tables and query development in Hive

Introduction to data pipelines

Note(s): This course uses Cloudera Hadoop. Students are required to bring laptops—with 64bit CPU and a minimum of 8GB of memory—to class.

Skills Needed: Basic SQL skills and the ability to create simple programs in a modern programming language are required. An understanding of database, parallel or distributed computing is helpful.

Designing, Building and Integrating RESTful API

2.0 Units

Databases, websites, and business applications need to exchange data. This is accomplished by defining standard data formats such as Extensible Markup Language (XML) or JavaScript Object Notation (JSON), as well as transfer protocols or Web services such as the Standard Object Access Protocol (SOAP) or the more popular Representational State Transfer (REST). Developers often have to design their own Application Programming Interfaces (APIs) to make applications work while integrating specific business logic around operating systems, languages or servers. This course introduces these concepts with a focus on the RESTful API. The course also introduces the data exchange mechanism and common data formats. For Web exchange, you will learn the HTTP protocol, including how to use SOAP with XML. The course compares SOAP and REST, then covers the concepts of stateless transfer. It introduces software API design and best design practices. The second half of the course focuses on RESTful API design and implementations using Python Django, the most popular web development framework. You will learn how to build and consume RESTful services using JSON and XML, and integrate RESTful API with different data sources through hands-on coding projects. Through four coding assignments, which form the course project, you will apply what you have learned to implement a Single-Page Application (SPA) with both the front-end (provided by the instructor) and the Django-based backend with REST web service.

This course is intended for software developers who use data in projects. It is also useful for data professionals who need to understand the methods of data exchange and how to interact with business applications.

Topics include:

Data exchange and Web services

Web Service Definition Language (WSDL), SOAP vs. REST, state vs. stateless

Introduction to API design

API design practices

Designing RESTful API

Building RESTful API

Interacting with RDBMS (MySQL), NoSQL databases

Consuming RESTful API (i.e. JSON, XML)

RESTful API Testing

Students required to bring laptops for coursework.

Skills Needed: Python programming experience is required for the exercises and the project.

Designing Online Instruction

2.0 Units

Online learning opportunities are expanding rapidly. To be successful, online teachers need the skills to translate face-to-face instruction into content for the online environment. This course looks

at the benefits and challenges inherent to this venue for teaching, and covers best practices in the design of online instruction. The course focuses on ways to promote learning as well as dialogue with the instructor and fellow students. Students develop an online module that includes a variety of engaging instructional activities for learners. Assessment strategies will be discussed as part of the design process.

Designing Training Programs

2.0 Units

This course details how to design a training program or event. You'll gain insight into the instructional design process, including adult learning principles and training needs analysis with a focus on defining learning objectives; and you'll learn to use experiential methods to plan learning activities, structure a training program and evaluate your program. The course emphasizes using the appropriate instructional design skills and methods to create a learning activity. You'll get the chance to design a training activity that applies directly to your work, and receive constructive feedback from the instructor and your peers at various stages of the design process throughout the course. Topics Include:

Fundamentals of training programs

Overview of the instructional design process

Principles of adult learning

Current issues in training

Use of the ADDIE model to design a training program: Analysis, design, development, implementation and evaluation

By the end of the course, you should be able to:

Complete a learning needs assessment

Write concrete learning objectives for desired training outcomes

Create appropriate experiential learning activities

Develop a training plan and create a learning program structure

Design a training program evaluation

Develop and present a training program proposal

Designing User Experience for Smart Things, Virtual Reality and Wearable Technology

3.0 Units

Consumers have entered a multi-device environment where they own multiple connected devices such as watches, smart products, virtual reality (VR), augmented reality (AR), smart glasses, activity trackers, Internet of Things (IoT), smartphones, tablets and home automation, and use them cohesively. As these devices evolve, so does the process of mobile design, including the mobile UI and mobile UX that work across these products. This course encourages you to create UX/UI features for real-world mobile app products.

This course offers a hands-on approach to the UX/UI design guidelines for these devices. You will learn the principles of creating effective user interfaces that incorporate wearable technology. In addition, you will be introduced to rapid prototyping tools. The course covers flat design, responsive design, and parallax web design. You will also learn new lean models that will help you cultivate new design processes and solve problems for your products. The course emphasizes product coherence among multiple devices. Topics include future UI design trends such as mHealth, mPayment, mCommerce, voice-user interface, augmented reality, VR and emotional design. At the end of this course you will have a design portfolio and prototype that you can showcase to employers.

Topics Include:

Apple Watch human interface guidelines

Android Wear human interface guidelines

Augmented Reality (AR) UX design

Virtual Reality (VR) UX/UI design (Oculus Rift and Samsung Gear VR)

Designing smart things UX/UI

Autonomous Cars UX

Drone Mobile UX Design

Connected home and IoT UX/UI

Chatbots UX/UI design (Facebook, Slack)

Car dashboard UX/UI design (Apple, Google, Tesla)

UX of voice interaction (Amazon Echo, Google Home, Siri)

Smart tracking (Tile)

Healthcare, sport, smart baby devices

InVision mobile prototyping tool

How to create emotional design and micro interactions UX

Responsive design/parallax design

Designing glasses for AR

Creating multi-device experiences

Skills Needed: Familiarity with a drawing tool is required to complete class exercises (e.g. Adobe Illustrator, Photoshop, Fireworks or Sketch.)

Designing with Cascading Style Sheets: Advanced

2.0 Units

This course provides an in-depth exploration into the expanding world of Cascading Style Sheets (CSS), covering responsive website designs that work with smartphone, tablet or desktop monitors. Lectures and hands-on exercises cover essential CSS3 properties, concepts, techniques, and applications of media queries, styling forms, fonts and structural pseudo-classes. You will also learn how to handle browser compatibility issues. By the end of the course, you'll know how to use the latest CSS capabilities to create Web pages with clean, efficient and cutting-edge designs that meet the demands of mobile, tablet and desktop users. Topics Include:

Designing Web pages that respond to media types (mobile phones, tablets, desktops)

Child, sibling and structural pseudo-class selectors

Style forms

Drop-down menus

Image styling techniques (image replacement, galleries, drop shadows, borders)

Browser compatibility issues

CSS3 properties, including:

* Border radius

* Box and text shadows

* @font-face

* Gradients

Skills Needed: It is required that students take the prerequisite courses or have equivalent experience. HTML and CSS basics will not be repeated in this course.

Designing with Cascading Style Sheets: Fundamentals

2.0 Units

For Web designers, cascading style sheets (CSS) is an essential and mandatory coding language for controlling the presentation of a modern Web site. Combined with proper HTML markup, CSS allows for precise control over Web page appearance. Because a style sheet can be linked to many Web pages, changing one element in a style sheet can affect the look of an entire site. This introductory course includes demonstrations and hands-on exercises covering the application and syntax of CSS; hand-coding CSS properties for font and text formatting; backgrounds; the box model; creating vertical and horizontal navigation menus and two and three column page-layouts. Inheritance and specificity are also discussed. At the end of the class, students will be able to design table-less Web pages by applying cascading style sheets and will understand the techniques, which adhere to current CSS specifications.

Topics include:

Tools and techniques to write and validate CSS

Separating a page's content from the visual presentation of the page

External, internal, and inline styles

CSS selectors such as element, class, ID, pseudo-class and attribute selectors

CSS properties for font and text formatting, lists and backgrounds

Inheritance and Specificity

The Box Model

Styling Tables

CSS for Printing

Horizontal and vertical navigation bars

Creating two and three column layouts

Positioning including relative, absolute and fixed

Working with the z-index

Skills Needed: "HTML Fundamentals" or equivalent experience.

Developing Enterprise Java Microservices with Spring Boot and Spring Cloud

3.0 Units

Formerly: Developing Enterprise Java Applications with Spring Boot and Microservices

Spring Framework is a popular full-stack Java application framework that simplifies enterprise application development and promotes good programming practices by offering a set of highly powerful and independent services. Spring Boot makes it even easier to create Spring applications with intelligent defaults to get you started quickly. Hibernate is a high-performance and mature object relational mapping (ORM) framework based on a solid implementation of the Java Persistence API (JPA). Microservices are an evolving system architecture design and an implementation of the service-oriented architecture (SOA) to handle the diversity of devices, heterogeneous systems and the complexity of business logic seen in enterprise applications today. Major Internet companies and websites have adopted the new architecture and development methodology in recent years. This hands-on course introduces several software tools for working with Java applications, including project configuration, dependency management using Maven,

source control using Git, and the Eclipse development environment. The course includes an overview of Spring, including core concepts such as Inversion of Control (IoC) and dependency injection.

You will build a sample Java application that creates RESTful Web services. The project uses Spring Boot and the MySQL database server as the datastore. You will also learn how to create microservices applications using Spring Boot and work with databases using Hibernate. The course emphasizes testing all parts of your code with test automation, using JUnit and its Spring integration.

The course offers hands-on experience with open-source and demo tools, servers and databases. Students are required to bring laptops to class.

Topics include:

Tools for building enterprise software: Eclipse IDE/Spring STS, project configuration, dependency management (Maven) and source code management (Git)

Spring: Dependency injection / Inversion of Control

Service-oriented architecture (SOA)

Microservices deployment

Creating RESTful Web services with Spring MVC

Spring Boot applications

Testing using JUnit and its Spring integration

Spring Data – JPA, Hibernate and MySQL

Developing JavaScript-based Rich Web UI with JQuery

2.0 Units

JQuery is a fast and concise JavaScript library that simplifies tasks for rapid web development. Not only does it provide a common browser API to enable cross-browser support, JQuery also promotes robust, smart and readable JavaScript code for simplicity of use. JQuery is used in web applications irrespective of the language or technology employed on the server side, such as PHP, ASP, JSP, CGI, Python or Ruby. JQuery is widely used in Internet and enterprise companies such as Google, Dell, and Yahoo. After an overview of the JQuery framework, this course explores the inner workings of document object model (DOM) and HTML content, including traversal, modification, user interactions and event handling. Students learn to leverage the browser event model, perform AJAX requests using JQuery, add effects and animations to web pages, and use JQuery plug-ins. The course also addresses working with CSS (Cascading Style Sheets) and form data.

Through a series of lectures, labs and exercises, students learn the JQuery framework in a hands-on environment. Upon completing this course, students will be able to harness the power of JQuery to build engaging and rich web applications.

Topics include:

Introduction to JQuery

HTML DOM element selections

HTML DOM traversal and modification

User interactions with event handling

CSS style manipulation

Effects and animations

AJAX

Plugins and extensions

Skills Needed: Some knowledge of HTML, CSS, and JavaScript. Must have recent programming experience.

Developing Technical Information from Plan to Completion

2.0 Units

This course focuses on technical communication skills. It introduces the types of information commonly produced by technical writers. Participants integrate the fundamental technical-writing strategies with the principles of print and online document design to create information that is effective and appropriate to specific audiences. Participants assess and improve a document draft's organization, clarity, conciseness and consistency. The course includes practical experience in writing technical information, analyzing tasks, negotiating with subject-matter experts, setting production schedules and managing multiple projects. In this course the instructor will address how to apply technical writing strategies to various types of technical information; determine appropriate formats for technical audiences; identify styles, standards and design for online and print documents; and demonstrate the life cycle of technical writing projects.

Developing the Nanometer ASIC: From Spec to Silicon

2.0 Units

At 32 nanometers and below, today's silicon chips are so complex that few engineers, designers, programmers, and managers fully understand every phase in the IC development cycle. This unique course covers each step in developing an ASIC, explaining in an intuitive and visual manner such key concepts as transistor action, standard cells, RTL synthesis, meeting timing, functional coverage, formal equivalence, physical design, signal integrity, DFT and BIST, tape-out, IC fabrication, and emerging packaging trends. The course includes hands-on "quick tour" labs to familiarize students with the roles of synthesis, simulation, formal equivalence, and routing tools. The focus is on mostly-digital ASICs with multiple IP cores, low-power goals, and on-chip RF-CMOS /analog blocks. A preview of 22-nm technology - the trigate transistor - is included.

The course is intended for ASIC professionals, both experienced and entry-level who are seeking a more in-depth understanding of the chip development flow. Knowledge gained in this course will improve cross-functional communication with other team members and prepare students for more rigorous study in the ASIC or SoC field.

Topics Include:

Overview of ASIC architectures, including networking chips

Integration of IP cores: formats, deliverables, watermarks, etc.

Overcoming the verification bottleneck: embedded assertions, constrained random tests, equivalence checking and emulation

How on-chip firmware code interacts with the chip's hardware

Creating layout for tape-out: metal layers and vias, routing insights, noise avoidance, DFM issues, timing closure

How a taped-out design is fabricated onto a silicon die at 32 nm

Doing business with silicon foundries: sort, shuttles, corner lots

Comprehensive coverage of the chip design flow, from spec through tape-out to fabrication and packaging, equipping students for follow-on courses in RTL design, verification, DFT, and layout

Skills Needed: General understanding of digital logic. Lab exercises require some knowledge of Linux.

DevOps Technologies

3.0 Units

DevOps is a combination of software development and IT operations methodologies and technologies. DevOps introduces many functional and technical changes in how companies design, develop, and deploy technologies, infrastructures, and applications. DevOps combines Agile software development practices and IT automation techniques to achieve rapid rates of high quality deployment.

This course will focus on the technologies and tools used by DevOps engineers. Upon completion of this course students will understand the core technologies and tools used within DevOps environments.

Topics Include:

Why DevOps? What do DevOps engineers/teams do?

Automating Deployments

* Using BASH

* Programmatic ssh

Virtual Environments

* Virtual Machine Concepts

* Tools: Vagrant

* Automating N-Tier VM Deployments

Microservices

* Why Microservices

* Hybrid Microservice Architectures

Containers and Docker

* Concepts

* Deploying Microservices in Containers

* N-Tier Container Deployments

Deploying Containers in Virtual Machines

* Docker + Vagrant

Infrastructure as Code

* Git

* GitHub

Skills Needed: Students must have basic programming experience using a high level programming language like Java, Python, C#, or a scripting environment like Bash.

Digital Design with FPGA

3.0 Units

Field-programmable gate array (FPGA) offers quick-turn, re-configurability, high density, high performance and low non-recurring engineering costs. To meet design requirements, designers must understand the FPGA fabric and how they affect the actual design of the logic functions. This course provides the knowledge and hands-on experience in designing digital logic blocks in FPGA. The course covers the major FPGA architectures from Xilinx, introduces how to build designs in FPGA and presents specific designs of various digital blocks. Starting from combinational logic, look-up tables, carry chains, and multiplexers, students will learn to design arithmetic and comparator functions using FPGA and test them in action. The instructor then explains sequential flops, fast counters and shift register look-up. The course also explores the various embedded RAM, ROM and finite state machine designs using Xilinx architecture.

The course builds on the knowledge of digital Verilog designs and emphasizes the interaction of FPGA fabric on design without elaborating on FPGA applications. Students gain insight and

experience with FPGA design. The course uses Xilinx parts as examples; topics covered are applicable to all major FPGA architectures.

Topics Include:

Introduction to FPGA

Look-up tables (LUT) and flops on a FPGA fabric

Building simple circuit and programming on a FPGA board

Building a digital clock on a FPGA board

Building combinational logic exploiting LUTs and carry chains

Building latch and flip-flop

Fast arithmetic and comparators design

Single port and dual port RAMS

Shift register look-up table (SRL)

Synthesis of RAM and ROM

FSM design

Note(s): This course requires the purchase of a development board ($150, not included in the course fee) and uses the vendor development kit to implement logic functions. Detailed board information will be provided at the first class meeting.

Skills Needed: Students must have Verilog coding experience to carry out design assignments. FPGA experience is not required.

Digital Logic Design Using Verilog

3.0 Units

This course is a practical introduction to digital logic design using Verilog as a hardware description language. Students learn Verilog constructs and hardware modeling techniques using numerous examples of coding and modeling digital circuits and sub-blocks. Verilog remains the legacy hardware description language for digital designs in the industry. The course starts with the basic concepts of hardware description, then goes into the key Verilog language elements and data types. Students tackle key challenges and learn structural, dataflow and behavioral modeling in Verilog, including common constructs, considerations and coding examples. Instruction in the coding and testing of digital logic includes examples of combinational circuits (gates, mux/demux, encoders/decoders, and general Boolean expression), sequential circuits (various latches, flip-flops, shift registers, counters, RAMs and ROMs), and complex logic (flavors of ALU and FSM).

At the completion of the course, students are able to understand and implement Verilog modeling of basic digital logic. Ultimately, students write and simulate approximately 3000 lines of Verilog code. The synthesis and simulation of the test examples is done using freely downloadable tools with instructor guidance.

Topics Include:

The need for a language to design digital circuits

Verilog tutorial

Verilog language elements and data types

Structural style modeling

Data flow modeling, Behavioral modeling

Combinational logic design

Sequential logic design

Arithmetic circuit design

Synthesis of RAM, ROM and DSP

FSM design

Skills Needed: Knowledge of basic logic design and familiarity with a high-level programming language (e.g., C) and use of a text editor.

DITA Information Architecture

The value of DITA is expressed in its enforcement of a topic-based architecture. DITA provides specific mechanisms, including DITA maps and relationship tables, that enable information architects to provide a valuable and usable information experience for their users.

This course consists of pre-recorded lectures and demonstrations with assignments, workshops, and discussion, covering:

Background to DITA: XML, topic-based authoring, and the DITA standard

DITA content types: concept, task, reference, and glossary

Using maps to plan your information, organizing your topics, and manage links and metadata for your deliverables, as part of a task-oriented information architecture and process

DITA conditional processing and content reuse

DITA specialization: Creating new content types and maps using DITA's specialization architecture

Futures of DITA: Exploring the potential of DITA in Web 2.0, enterprise content strategy, lifecycle and cross-discipline integration

For Online Sections of this course: Online courses are largely self-study with instructor support through threaded discussion groups, email and sometimes scheduled online chats. Some instructors may allow students to pace themselves following the published syllabus, enabling them to accelerate through the material and finish early. However, all students must complete and submit all assignments by the schedule end date. Grades are issued for the entire class approximately two weeks after the scheduled end date.

DNA Microarrays: Principles, Applications and Data Analysis

3.0 Units

DNA microarrays, also known as DNA or gene chips, have revolutionized the field of molecular biology. They provide the ability to quickly and efficiently analyze complex biological processes. As a result, they play a leading role in the discovery of new biopharmaceuticals. Topics include: overview of DNA microarrays--types and features, array design and setting up microarray experiments, data extraction from DNA chips, preprocessing and normalization of microarray data, statistical analysis, interpretation and data mining techniques for microarray data using popular software, challenges and future technologies (next generation sequencing). This course covers the principles and applications of the latest DNA microarray technologies, including the analysis of microarray data. It is intended for biotechnology and pharmaceutical professionals, statisticians, computer scientists and others who are interested in understanding this important technology.

Document Preparation: Protocols, Reports, Summaries

1.5 Units

Clinical trial documentation must be clear, scientifically sound, conform to regulations and established standard operating procedures, and follow regulatory guidelines. Despite pressure to start the trial "yesterday," a clinical trial cannot begin without a study protocol in place. Many other documents are needed before and during the trial, and the trial does not end until a final report has been submitted. Documentation of the trial often continues with articles in the biomedical literature. This course provides insight into the processes for preparing effective study protocols, reports, and summaries. Participants have opportunities to practice preparing documents and applying the rules governing clinical trial documentation. Professional Credit: CA BRN/LVN Credit--Provider #CEP13114.

Drug Development Process

3.0 Units

The development of new drugs is a highly complex, lengthy and expensive process. In this course, you examine this process---from discovery to market and beyond---and see what makes the biopharmaceutical industry unique. Infused with real-world examples, lectures will address drug discovery; preclinical characterization of new drug entities; the phases and purposes of both pharmacological and clinical development; regulatory filings, compliance and oversight; FDA jurisdiction; and strategic issues in drug development. The course provides an important foundation

in drug development for professionals from all disciplines who are currently working in or are considering a move to the biopharmaceutical industry. Professional Credit: CA BRN/LVN Credit--Provider #CEP13114.

Drug Discovery, Introduction

3.0 Units

This introductory course provides a framework for understanding the process of drug discovery, from target selection and validation to lead optimization and preclinical studies. Although the fundamental principles of drug discovery are well established, the tools, technologies and methods used in the discovery and development of safe and effective drugs are constantly evolving. Personalized medicine and novel diagnostics involving biomarkers, pharmacogenetics and pharmacogenomics in clinical practice are changing the landscape of drug discovery. The instructor will address fundamental and translational principles and cutting-edge approaches along with strategies for integrating current scientific approaches into the drug discovery process. Topics include:

Target identification and validation

High throughput screening, hit identification, hit-to-lead and lead optimization

Induced pluripotent stem cells in disease modeling and drug discovery

Structure-activity relationship, in silico drug design and molecular modeling

Pharmacokinetics (absorption, distribution, metabolism, excretion and toxicology)

Pharmacodynamics

Toxicology

Personalized medicine in drug discovery, including the OMICS technologies, biomarkers and single nucleotide polymorphism analysis in patient diagnosis, stratification and monitoring

Gene Therapy and Tissue Regenerative Medicine.

Professional Credit: CA BRN/LVN Credit--Provider #CEP13114.

Drug Safety and Adverse Events Reporting

1.5 Units

Regulators, the public, and the medical community are scrutinizing the safety profiles of pharmaceuticals more closely than ever. Thus acquiring, verifying and reporting quality safety data are crucial to obtaining and maintaining product approval. This course introduces fundamental concepts essential to drug safety and adverse event reporting and how to apply them to situations encountered during clinical trials and post-marketing reporting. You'll learn why safety reporting is crucial; the definitions of an adverse event and the key reporting issues of seriousness, expectedness, and relationship to the study drug. The course includes a brief overview of reporting requirements in the U.S. and abroad and the documents associated with these reports. The content

is appropriate for CRAs, CRCs, drug safety associates, and regulatory affairs personnel. Professional Credit: CA BRN/LVN Credit--Provider #CEP13114.

Early Childhood Education Certificate Completion Fee

Once all of the certificate requirements have been met and your final grades are posted, please access your Student Portal to enroll in the “Certificate Completion Fee” to begin the review process. Please allow 4-6 weeks to receive your certificate.

Early Childhood Education: Supervision and Administration Certificate Completion Fee

Once all of the certificate requirements have been met and your final grades are posted, please access your Student Portal to enroll in the “Certificate Completion Fee” to begin the review process. Please allow 4-6 weeks to receive your certificate.

ECE 10: Supervision and Administration: Parents as Partners in Education

3.0 Units

This course will examine ways of creating an environment where parents and teachers work in partnership for the education of young children. Attitude, understanding and skills which lead to effective communication and cooperation between home and school will be shared and explored.

ECE 11: Supervision and Administration of Early Childhood Centers, Part A

3.0 Units

This course focuses on the history of early childhood education, the laws governing early childhood centers in California, and the goals of early childhood education. You’ll also discuss the administrator's job description, budgeting, personnel selection and standards, records and reports, and staff policies. The course discusses laws and regulations pertaining to the operation of an early childhood program and examines how to budget administrative responsibilities. You’ll develop the skills necessary to create an early childhood environment which meets space, equipment, health and safety requirements, and evaluate your program quality using the Environmental Rating Scale. This course is a good fit for educators interested in obtaining the California Child Program Director Permit. Topics Include:

Framework for your work

Self-evaluation

Learning goals and action steps

Staff conflict resolution

Child care budgeting/approach assessment

Hiring (qualifications and job descriptions)

Licensing policies and procedures

Child care environment rating

Creating your program’s vision

ECE 12: Supervision and Administration of Early Childhood Centers, Part B

3.0 Units

This course explores the challenges and issues related to the supervision and operation of preschool programs. Staff-administrator relationships, staff inservice education and working with parents are also covered.

ECE 13: Adult Supervision and Mentoring

3.0 Units

This course examines the process of building a staff organization through development of effective communication and interpersonal relationships. Topics include the criteria for selection and evaluation of personnel, involvement of staff in the planning and evaluation of programs, the administrative role in promoting professional growth, teaching effectiveness and developing sensitivity to individual needs.

ECE 1: Development in Early Childhood

4.0 Units

Participants explore human development from prenatal stages through middle childhood and study the interrelationships among social, emotional, physical and cognitive development, with a focus on the role of play in early childhood. Using observational techniques, the class identifies developmentally appropriate characteristics and activities.

ECE 2: Introduction to Teaching Young Children

3.0 Units

This course studies the philosophy, history and development of early childhood programs. You'll examine the teacher-child relationship and how existing programs meet the needs of preschool children and review programs to evaluate how they meet the criteria of a quality learning environment. You'll get a chance to see how ECE programs operate in the real world by attending mandatory field observations at sites designated by the instructor. Topics include:

History of early childhood education

Types of programs

Defining the young child

Developmental and learning theories

Teaching: A professional commitment

Curriculum: Creating a context for learning and play

Issues and trends in early childhood education

ECE 3: Curriculum Development in Early Childhood Programs

4.0 Units

In this course, you'll examine basic child development theories in relation to design and implementation of curriculum for young children. Topics include the design of developmentally appropriate lesson plans and learning centers to fit the needs of specific age groups, the steps involved in curriculum development, material and equipment selection, planning group experiences, and basic guidance techniques for young children. The course emphasizes the value of play and learning environments and developmentally appropriate materials and activities.

ECE 4: The Young Child in the Family and Community

4.0 Units

This course focuses on the dynamics between the young child and his or her family, school and community, including various cultural and social influences. Participants explore ways to develop communication skills between young children and peer groups, parents and teachers. Community resources and social services, including healthcare, welfare and counseling, are reviewed.

ECE 5: Positive Guidance and Discipline for the Young Child

3.0 Units

Participants in this course learn to identify children's behavior to determine whether it is normal, developmentally appropriate or problematic. Cooperative discipline is explored in the wider context of classroom management, working with staff and parents. Behaviors are examined to better understand why children behave the way they do and to correct behaviors with a guidance and discipline strategy that is positive, respectful of both child and adult, and developmentally appropriate. Participants also learn to practice prevention of certain behaviors and guide children through the use of positive discipline. The focus is on how an adult can behave when a difficult situation arises and be as effective as possible in creating an atmosphere of safety that supports all

children in reaching their fullest potential.

ECE 6: Culture and Diversity in the Early Childhood Classroom

3.0 Units

This course explores diversity, values, culture, racism and oppression from the educator's' viewpoint and the impacts these factors have on creating a positive multicultural classroom environment. You'll learn various styles of communicating with parents, and role-play scenarios to practice handling awkward situations. Course assignments provide an opportunity to develop multicultural lesson plans that can be used in an early childhood classroom. Topics Include:

Diverse learners

Cultural diversity

Racism and oppression

Differentiated instruction

Multicultural lesson plans

Home-school partnerships

Confronting bias and overcoming cultural conflict

ECE 7: Practicum in Early Childhood Education

5.0 Units

This course provides early childhood education professionals with the opportunity to observe and evaluate children, applying theoretical and practical models from the field of early childhood education. Course activities include structured observation, analysis of the roles of adults, lesson planning, parent conferencing and reflective teaching. Meets the California requirement of 3 semester units (equal to 5-quarter units) of supervised experience for teachers applying for a Children's Center Permit as described in the Child Development Permit Matrix see here: http://www.ctc.ca.gov/credentials/CREDS/child-dev-permits.htm

Topics Include: Getting started

Environments and schedules

Collaborating with families

Understanding and guiding behavior

Observing and assessing children

Curriculum development

At the end of the course, you should be able to: Plan and implement developmentally appropriate curriculum activities for the early childhood education classroom

Locate and utilize professional resources

Demonstrate skills in appropriate guidance and disciplinary techniques with young children

Understand and implement skills in working with parents as partners in their children's learning process

Create appropriate indoor and outdoor learning environments for young children

ECE 7: Internship requirements: FAQ To obtain credit for this course, you need to be supervised by a mentor teacher at a school where you are teaching. The class meets only twice, once at the start and again at the end of the practicum. You are expected to complete your hours at a school and submit your assigned work on the last day of class and online. The Extension instructor is available for online guidance and support for both students and mentors.

PLEASE NOTE: Extension does not provide mentor teachers for the purpose of this practicum. You are responsible for finding your own mentor teacher.

Mentor teachers should be working in a licensed, preferably accredited, facility. Family child care is not permitted. It is acceptable to select a kindergarten teacher as a mentor.

Mentor teachers must have at least 5 years of experience working with children in the role of lead teacher or director. They should have a minimum of 24 units of training in early childhood education and meet the requirements for a master teacher permit. A site supervisor or director permit is desirable. The mentor teacher's credentials must be given to the Extension instructor at first meeting.

ECE 8: Child Health, Safety and Nutrition

3.0 Units

This course is highly beneficial for anyone working in an early childhood educational setting. It introduces the theory, practices, and requirements for establishing and maintaining a safe and healthy learning environment. Topics include healthcare policies and procedures in the child-care setting, childhood nutrition and obesity, prevention of disease transmission and injuries, child abuse and neglect. You will also learn to provide a quick health check for children and plan healthy menus.

Note: Students are encouraged to obtain CPR certification by enrolling in ECE: CPR and First Aid

(EDUC.812).

ECE 9: Language and Literacy for the Young Child

3.0 Units

This course covers the development of language in children and outlines experiences and techniques that enable children to further that development. You'll learn how to promote oral language abilities through the active use of books, poetry, dramatic play and group discussions. You'll gain insight into grammar, phonology and semantics; common speech problems, and language arts curricula that can help foster literacy in the classroom. The course also reviews the reading process along with various reading theories and issues. Topics include:

Language development

Early literacy

Classroom library

Classroom environment

Storytelling, poetry, dramatic play

Reading and writing

Language arts curricula

ECE: Brain Development in Early Childhood

1.0 Units

How does the human brain develop during the first years of life? How can a child learn two or more languages at the same time? How does stress slow brain growth? This course answers those questions, providing parents or teachers of infants, toddlers or preschoolers with the latest research in brain development, demonstrating how this information can enhance parenting and teaching practices. This course will help you appreciate a child's unique qualities and your own strengths, as you work toward long-term success in parenting or teaching.

ECE: CPR and First Aid

In most cases, specified personnel working in childcare centers and in other group-care settings must meet mandated training in pediatric health and safety. This 8-hour course covers infant, child, and adult CPR techniques, pediatric first aid, scene assessment, and preventive-health and injury practices and policies. The course also meets the California State requirement for childcare providers. Upon completion, you will earn a two-year CPR certification with state-issued stickers.

Note: Academic Course Number EDUC.812

Professional Credit: CPR Certification

ECE: Creative Arts for the Young Child (Preschool Through Grade 3)

3.0 Units

You know intuitively that art activities engage children of all ages. But how can you make the most of your teaching with art? How can you---even without formal training---organize stellar lessons that leave the kids asking for more? In this fundamentals course, participants start with a review of art expression at each stage of early childhood development, then move on to understanding ways to foster creativity and the creative process. Next, participants work hands-on with basic art processes, such as, painting, drawing, and creating designs. Through mini-lectures, discussions, videos, and readings, participants prepare age-appropriate lessons that build visual and spatial awareness and relate art to other key curricula---science, mathematics, language arts, and social studies. Participants leave the course with an individualized portfolio, complete with lesson plans and objectives. Course activities include ample instructor modeling.

ECE: Infant/Toddler Growth and Development

2.0 Units

State licensing requires staff who work in infant and toddler programs to complete a three-unit semester course in Infant/Toddler Care and Development. This course satisfies the infant/toddler development portion of the requirement. The UCSC Extension course "Principles of Infant/Toddler Caregiving" fulfills the remainder of the state licensing requirement. This course is designed for those who work or plan to work in child-care programs for children up to three years of age. The focus is on understanding growth and development and recognizing the range of individual differences within developmental norms. Participants engage in a variety of activities to promote theory learning and observation skills. Topics include gross and fine motor skills, perception, emotions and feelings, social skills, cognition and language.

ECE: Principles of Infant/Toddler Caregiving

2.0 Units

This course satisfies part of the State Licensing requirement for the application of infant/toddler caregiving principles. The course "Infant/Toddler Growth and Development" fulfills the remainder of the requirement. This course is designed for those who work with children up to three years of age. The course focuses on understanding the principles of high-quality caregiving. Topics include

understanding the adult role in the development and implementation of curriculum for infants and toddlers, and essential curricula components such as physical setting, social environment and play.

Educational Assessments I

3.0 Units

This course introduces the assessment tools and procedures frequently used in educational therapy settings. In addition to classroom activities, you'll gain field experience using specific assessment instruments. You'll have access to a limited number of assessment instruments and will be assisted in your fieldwork placement. Testing is limited to educational assessment tools, which are widely used by educational therapists and do not require authorization to administer (i.e., credentialing as a school psychologist or licensing as a clinical or educational psychologist). The course offers insight into how to administer tests used by educational therapists. **Topics Include:** Understanding why educational therapists give assessments and conduct interviews

How to identify which assessments are appropriate for educational therapists to administer

How to review psycho-educational reports and other allied professional assessments in order to develop an effective treatment plan

Educational Assessments II

3.0 Units

In this course, participants are introduced to cognitive-educational report writing and the interpretation of findings from scores, interviews, and checklists. Discussion is limited to educational assessment tools which are widely used by educational therapists and do not require authorization to administer (i.e., credentialing as a school psychologist or licensing as a clinical or educational psychologist). Assessment batteries administered in the previous assessment course are used to generate the formal report. Participants also learn how to interpret test results, reports and findings from other allied professionals.

Educational Therapy Certificate Completion Fee

Once all of the certificate requirements have been met and your final grades are posted, please access your Student Portal to enroll in the "Certificate Completion Fee" to begin the review process. Please allow 4-6 weeks to receive your certificate.

Educational Therapy Practicum

5.0 Units

This final course in the Educational Therapy Certificate Program provides an opportunity for the intern to practice all aspects of educational therapy under the supervision of an experienced professional in the field. To arrange your internship, contact UCSC Extension for information.

Educational Therapy: Reading I

3.0 Units

This course is an introduction to the theories, issues, strategies and materials related to assessment and instruction of students with reading difficulties. The course emphasizes specific instruction methods and the selection and development of materials that match the diagnosed need of the individual.

Effective Employee Relations

1.5 Units

This course presents legal and practical methods for handling employee relations issues. Special emphasis is given to the 80 percent of job terminations that are on-the-job behavior-related. Topics Include: Employee communications Handling employee complaints, resolving employee conflicts and harassment Coaching managers through employee issues Performance management Voluntary and involuntary terminations Impact of mergers and acquisitions

Note(s): HRCI--PHR, SPHR and GPHR general recertification credit, 16.5 hours.

Effective Negotiations: Principles, Strategies, and Techniques

1.5 Units

How comfortable are you with the formal give-and-take of business negotiation? Whether you work in sales, marketing, management or business administration, you'll benefit from this course, which is designed for anyone who needs to leverage support from their company or other companies. You'll practice each stage of a business negotiation, from the initial planning to the final "handshake" and the memorandum of agreement. The course presents ten negotiation principles, including how to use the four basic forces in every business negotiation: power, information, timing and approach. The Negotiation Mode Matrix is used to demonstrate how to shift from ineffective negotiating strategies and tactics to more cooperative and mutually beneficial approaches. You'll review case studies and negotiation simulations to learn to translate new knowledge into job-related skills. The course addresses how to:

Prepare for a negotiation in a project management environment Recognize the four forces present in every negotiation Develop acceptable concessions Respond to negotiation deadlines Ensure that all last-minute steps have been taken Get a negotiation session off to a good start Recognize and counter the typical strategies and tactics Close a successful negotiation

Note(s): Professional Credit: Project Management Institute--PMP 15 Professional Development Units.

Effective Performance Management

2.0 Units

This course provides an overview of performance management, what it is, its benefits, and how it is applied in most organizations. You will learn how to develop effective performance management systems which involve goal setting, coaching and feedback, motivation, measuring performance against goals, performance appraisals, and employee development. In addition, you will gain an understanding of how employee coaching and leadership development tie in closely with succession planning, by developing high potential employees and identifying successors for senior level positions within an organization. We will also watch and defend a "mock performance appraisal review," listen to two guest speakers discuss new best practices in performance management, and review and implement new and experienced manager training.

During this class, you will: Learn how performance management is used correctly and sometimes incorrectly.

Understand how performance management means managing employee behavior in performing job requirements.

See how performance management is critical for getting organizational alignment and successful results. What about positive feedback?

Know how to develop and utilize a PM process and a performance appraisal system.

Gain managerial tips to on how to effectively implement performance management in an organization.

Understand how the performance management process dovetails into leadership development coupled with succession planning.

Learn about new manager training and development plans

Effective Procurement Strategies

3.0 Units

This new procurement strategy course is aimed at helping supply chain professionals as well as people new to the field, business leaders, and entrepreneurs optimize their effectiveness in sourcing, contract development, risk assessment, negotiation, and the rapidly changing technologies in the industry. When you integrate best procurement practices, you develop processes, strategy, and structure for an effective supplier and contract manufacturing supply base. Learn to maximize benefits for your organization in today’s competitive landscape.

It is highly recommended that students take "Evolving Role of Supply Chain Manager" as the first course prior to taking this course.

Learning Objectives Explain the various methods of procurement

Determine value and its application to product and service selection

Identify leading trends and technology used in procurement

Topics Covered Procure goods and service, and succeed in a competitive bidding environment

Source effectively and maximize contractor engagement and product value

Build specification and scope of work to maximize value and reduce cost

Approach risk and reduce it

Develop and manage effective contracts

Negotiate and collaborate with internal and external partners

Problem solve as a procurement leader

Capitalize on IT licensing and new technologies

Integrate best practices for value and cost reduction

Electronic Data Capture for Clinical Trials

1.0 Units

A major trend among life science organizations has been the recent shift from manual, paper-based clinical data collection processes to the predominant use of electronic systems that expedite the availability of accurate clinical trial data. This course examines some of the key issues surrounding the industry's adoption of Electronic Data Capture (EDC) and gives students the opportunity to use EDC software on classroom computers during simulated clinical trials. The instructor illustrates the major differences between EDC software and paper-based trials, and systematically examines the costs, risks, related process changes and other business and regulatory implications of this shift. A significant portion of classroom time is devoted to hands-on EDC activities using actual commercial EDC systems from industry-leading vendors. Students will take on the roles of study coordinators, investigators, study monitors, data managers, and other sponsor personnel, using those commercial EDC systems to explore key EDC concepts and tasks performed during clinical trial startup, conduct, and closeout.

The course benefits clinical site personnel (primarily study coordinators and investigators) as well as bioscience industry professionals having roles in data management, study monitoring, clinical management, and others involved in the evaluation, design, and implementation of an EDC system.

Professional Credit: CA BRN/LVN Credit--Provider #CEP13114.

Embedded Design with Xilinx FPGAs

3.0 Units

This hands-on course will introduce you to the world of embedded microprocessor design using field programmable gate arrays (FPGAs). Combining the FPGA fabric with the popular ARM 9 processor cores, it opens up many possible applications with integrated custom peripherals and significant cost/time advantages in design. The course uses the Xilinx Zynq product family including two soft core processors, Picoblaze 6 and Microblaze MCS, and Virtex 7 fabric. The course begins with an architectural overview of the FPGA family and follows with an in-depth look at the ARM 9 cores. Along the way, you will use the Vivado Design Suite and software development kit (SDK) to develop your code, as well as the cross assembler. The SDK supports both C and C++ compilers with debug facilities. We will use real-world design examples, as well as former students' projects, to share the creative ideas that this design framework can offer. You will also learn practical approaches to debugging and simply 'bringing the system up'. A project report is required at the end of the course, with an optional student presentation during the final class for extra credit.

Topics include:

Introduction to embedded FPGA architecture

Introduction to Picoblaze and cross assembler

In-class demo of bringing designs 'up' and mapping to Zynq

Introduction to Microblaze MCS and Xilinx SDK

In-class demo of bringing programs up on the same design framework

In-depth look at the ARM 9, AXI, and the fabric interconnections

How to build a basic Zynq design in Vivado, using IP and interacting with SDK

Additional Zynq based designs with Vivado

How to profile designs and debug approaches

Optional student project presentations

Note: Students are required to purchase a Zynq-based board for their project (approximately $100, not included in the tuition). Detailed board information and instruction will be provided on the first night of class.

Skills needed: Understanding and experience with basic FPGA design. C or C++ programming experience is required.

Embedded Firmware Essentials

2.0 Units

All embedded systems require firmware to enable their features. In addition to C programming, firmware engineers must understand system and CPU architecture as well as the IO and memory interface; master the techniques to manage limited memory and OS processes, and code programs

that are suitable for hardware bring-up and application development. This course provides practical in-depth knowledge and coding exercises for firmware development. The course reviews the embedded system architecture and hardware configurations, including the ARM Cortex-M instruction set. You will be introduced to using C codes to enable or disable hardware features, and gain hands-on experience with clock, timing, delays, and latency when working with different SoC, memory and IO interfaces. You will also learn to write efficient ROM code with limited memory and timing budget.

Most firmware development in industry is done on Linux systems. You should have solid C programming skills and be ready to do all class projects with GNU Tools in a Linux environment. You'll gain experience through a board project. The course will prepare you to take on additional embedded software courses for a wide range of product interests.

Topics Include

Introduction to firmware and GNU Tools for ARM embedded processors

ARM-Cortex-M computer architecture

Memory and system architectures

Digital IO: GPIO, RS232, I2C

Firmware architecture: Task scheduler

Data structure: Circular buffer

Flash Memory

Notes: Students are required to bring a laptop with Linux installed for in-class exercises. Options include VMware, VirtualBox, LiveCD, disk partition or separate drive. Students are also required to purchase a small board, breadboard, resistors, LED, and wires (approx. $70 to $120, not included in the tuition) to do class projects on their Linux laptops. Detailed board information and instruction will be provided on the first night of class.

Embedded Linux Design and Programming

3.0 Units

This course covers the fundamentals of building and installing a custom embedded Linux for an ARM processor platform, and provides hands-on experience for creating cross-platform environments using the GNU tools. Basic concepts for designing, testing, and customizing embedded Linux will be covered, including how the Linux scheduler is implemented, and how to write Linux kernel modules and remotely debug embedded Linux applications. Topics include:

An overview of embedded and real-time systems

Creating a cross-compiler

Linux device tree usage

Building and configuring a custom Linux kernel

Building and debugging Linux application source code using a GDB debugger

Writing kernel modules and user applications for embedded Linux using C language

Linux sysfs interface for GPIO

The basics of POSIX threads and the RTAI (real-time application interface) environment

Note(s): To do projects, students are expected to have access to Debian Linux on their computers. Options include VMware, Virtual Box, LiveCD, disk partition or separate drive. Instructor will not cover the Linux installation topic in class. For students needing help with Linux, "Introduction to Linux" is recommended. Students should come prepared with knowledge of the suggested prerequisites.

This course requires students to purchase a board (approx. $50, not included in the tuition) to complete the assignments. Students may either use Raspberry PI 2 Model B or Raspberry PI 3 Model B or a Next Thing Co. C.H.I.P board (details to be discussed in class). Students are expected to use their own Linux-based computers to do the programming project.

Skills Needed: Working knowledge of C programming language and UNIX/Linux operating-system internals. Advanced C programming recommended.

Embedded System Hardware Architectures, Introduction

3.0 Units

Beginning technical professionals who want to learn the big picture of embedded systems will get a solid grounding in key concepts of embedded systems hardware design, one of the particularly hot areas for U.S. engineers today. Embedded systems are computer systems designed to perform one or more dedicated functions. They are found in a wide range of electronic devices, including PDAs, consumer electronics, networking equipment, industrial controllers, and military electronics. Gaining an inside look at some of the most common embedded systems and the functional blocks within those systems, students in this course examine hardware components and their interfaces as well as important considerations with regard to procurement and design. They learn embedded systems design considerations and several approaches to system building common in the industry. Other key concepts in embedded hardware design include memories used in embedded systems and their interfaces, basic concepts in microprocessors, microcontrollers, digital signal processors (DSP), and the typical buses used at the system level.

After completing the course, you will see how the key concepts in embedded hardware design fit together, including the interaction of these hardware components as well as important considerations with regard to procurement and design.

Topics Include:

Functional blocks and tear-down analysis

Hardware design considerations

Design methodology (ASIC, FPGA, COTS)

Memory subsystem and hierarchy, types (SRAM, PSRAM, DRAM, Non-volatile memories)

Microprocessors, microcontrollers

Inter-IC communications overview (SPI, I2C, Parallel Bus)

Skills Needed: Some familiarity with the hardware components of a computer system is required.

Embedded Systems Certificate Completion Fee

Once all of the certificate requirements have been met and your final grades are posted, please access your Student Portal to enroll in the “Certificate Completion Fee” to begin the review process. Please allow 4-6 weeks to receive your certificate.

Employment Benefits and Retirement Planning in Personal Financial Planning

3.5 Units

Planning for a successful retirement calls for a thorough evaluation of wealth, goals, and resources. In this overview course you gain theoretical insights and practical skills for managing the retirement planning process, an important component of personal financial planning. Learn how to determine the adequacy of your clients’ retirement resources and income. We will also discuss various employee benefit and government programs that provide retirement security. Topics include tax deferred retirement plans, pension, profit sharing, 401(k), 403(b), 457, SEP, IRA, and other tax qualified plans as well as nonqualified deferred compensation, and social security. Students are introduced to the fiduciary requirements of these plans and the taxation of benefits received as well as evaluation and selection from among the various plans covered.

English As a Second Language Through Music and Movement

2.0 Units

Music is a part of all cultures and, for many, is a very important part of our lives. For this reason, music is an exceptional tool for teaching ESL. Music and movement activities in the classroom can offer a creative and beneficial break from the normal routine. They can help your students develop the primary language skills of listening, speaking, reading and writing. A myriad of researchers have documented the fact that music provides enjoyment and assists in the development of language skills. This course will help your students sing their way to fluent English! The course provides the tools that teachers need to easily foster the acquisition of ESL through song lyrics and student movement. Students develop practical lesson plans with activities that can be used immediately in the classroom.

Estate Planning

3.5 Units

This study of estate planning is designed to equip financial planners to identify and solve estate problems from the financial planning perspective (without practicing law). The course covers a wide range of topics and issues, including tax objectives, wills and living trusts, the unlimited marital deduction, saving the "second tax," holding title to property, lifetime gifts and trusts, life insurance and annuities, business interests, post-death problems and analysis of recent tax changes as they apply to estate planning.

Note(s): MCLE--Minimum Continuing Legal Education State Board of CA, 30 hours.

Evolving Role of Supply Chain Management

1.5 Units

Supply chain management professionals who understand the latest best practices in this evolving field are in high demand. Students in this course take a look back to when purchasing was simply about buying requested materials and goods. They study the industry's evolution to include other areas of high impact such as, transportation, warehousing, and supplier management. Today's professionals have a much broader impact on an organization, particularly its bottom line, when they learn how to manage product planning, supplier development, and system implementation. The evolution of this field has made it one of the critical components of any successful company.

Learning Objectives Understand the role supply chain management plays in an organization

Recognize potential impacts to an organization's bottom line

Compare and contrast skills needed in the future

Topics covered Supply chain management defined

The purchasing multiplier

Product planning and development

Key skills for supply chain professionals

Trends in supply chain management

Experimental Methods in Molecular Biology

3.0 Units

The 50 plus years since the structure of DNA was solved have been punctuated by spectacular advances both in our understanding of biological processes and in the very methods developed to achieve this understanding. This lecture-based course provides a theoretical overview of the key molecular biology techniques used in basic life science research and by the biotechnology and biopharmaceutical industry for the discovery of novel therapeutics.

Topics include:

Gene cloning, manipulation and sequencing

PCR

RNA interference

Gene expression analysis

Protein expression, engineering, and structure determination

Fundamentals of experimental design

You'll also learn about high-throughput sequencing and microarray expression analysis, methods that generate massive amounts of biological data. The instructor discusses the types of data these techniques generate, the relevance to bioinformatics, and their uses in the diagnosis and treatment of human disease.

Extreme-Agile Project Management

1.5 Units

Extreme Project Management (EPM) uses an agile development model to effectively address projects with short increment delivery schedules, high uncertainty, rapidly changing requirements, and high visibility. Participants examine the principles, values, skills, tools and practices of EPM, while exploring both the methodological and interpersonal skills needed to succeed under EPM conditions. Models covered include the Flexible Project Model, Adaptive Project Framework, and Scrum. The differences between traditional and extreme projects are highlighted throughout. Participants develop the quantum mindset of extreme project reality, while expanding and focusing their leadership skills for EPM environments, gaining insight into effective stakeholder management, and acquiring the ability to exploit the extreme project model to rapidly deliver value to the organization. Note(s): Project Management Institute-- PMP 15 Professional Development Units.

Facilitation Skills

2.0 Units

This course focuses on how facilitation skills are applied to create and support learning activity designed to improve individual, group, and organizational performance. Participants also learn how these skills can be applied to other organizational needs related to training: effective meetings, team-building efforts, and individual training and development programs. This experiential course gives participants an opportunity to practice facilitation skills and receive feedback on how to improve their performance. Topics Include:

The values of facilitation

Building and maintaining a learning environment

Group development skills

Group observation skills

Experimental techniques for interacting with groups

Recording theory and practice

Examination of key processes necessary in successfully leading learning activities (such as needs assessment, priorities and goals, conflict resolution, decision making, problem solving, and communication)

Final Project: Preparing Your Job Search

1.5 Units

This final course in the Technical Writing and Communication certificate program prepares students to secure employment as technical communicators. Each student develops an industry-appropriate portfolio and resume that are tailored to the job market and the type of job desired. Students also learn how to make the most of social networks such as LinkedIn and prepare for interviews.

Topics include:

Identifying the types of jobs the student wishes to pursue Defining an appropriate job-search approach Developing networking skills Developing a resume to support your job search strategy Crafting cover letters targeted toward specific job postings Creating a professional portfolio and web presence Preparing for interviews Tracking your networking and job search progress

Prior to enrolling in this class, students must contact the department for approval. E-mail ExtensionProgram@ucsc.edu or call (408) 861-3860.

Finance for the Business Professional

1.0 Units

Business professionals and students interested in learning financial accounting skills get hands-on experience in this course analyzing and evaluating the information behind financial statements and relevant data. Master basic business accounting concepts and processes, financial statements, budgets, and financial ratios. Get the financial literacy you need to succeed in the business world.

Note(s): Professional Credit: MCLE--Minimum Continuing Legal Education State Board of CA.; HRCI--PHR, SPHR and GPHR strategic recertification credit, 13 hours.

Finance I, Fundamentals

3.0 Units

This course addresses financial management, including fundamental principles, planning and evaluation, and appropriate financial tools. Through lecture, readings, group discussion, and a group project, this course covers the concepts and tools of the financial marketplace. This course is designed for managers and team members from corporations, nonprofit organizations, municipalities, and those self-employed who are increasingly required to address the organization's goals for financial planning, working capital, capital budgeting and return on investment for goal alignment with corporate planning to meet stockholder goal of wealth maximization. Topics Include:

Key financial ratios for business analysis

Financial statement analysis

Funding, financial forecasting and risk analysis

Cost of capital, time value of money

Capital budgeting and investment risk

Valuing stocks, bonds and preferred stocks,

Capital budgeting systems

Working capital and cash management

Note(s): Professional Credit: MCLE--Minimum Continuing Legal Education State Board of CA.

Skills Needed: A foundation in basic financial accounting knowledge is recommended.

Financial Statement Analysis

4.0 Units

In both the public and private sectors, managers must be skilled at conducting research and analysis to determine if a firm is a good credit risk or a suitable investment, and if it can sustain operations. This course provides essential knowledge for the CPA examinations. It presents financial statements as a set of dynamic instruments used to support management decision making and protect the public interest. Participants learn to create reports and analyze financial statements for common problems affecting valuation, sustainable corporate performance, and bankruptcy forecasting and avoidance.

Note(s): MCLE--Minimum Continuing Legal Education State Board of CA, 40.0 hours.

First and Second Language Development

3.0 Units

The fields of linguistics and cognitive psychology have rendered theoretical models of first- and second-language learning and acquisition. Participants in this course examine how these theories apply in TESOL and bilingual education. Participants also examine the critical factors affecting language development. Among those covered are psychological factors such as motivation and communication strategies, sociocultural factors such as dialects and language policy, and pedagogical factors such as formal and informal learning. Participants draw upon their own language learning and teaching experience for examples that relate theory to practice.

Fundamentals of English Grammar for ESL Teachers

2.0 Units

This course familiarizes prospective ESL teachers with those aspects of English grammar that are crucial for their students, who bring special grammatical challenges to the learning process. An ESL teacher can become truly effective only if he or she is able to identify, objectify and then clarify those challenging aspects of English grammar. The main objective of the course is to explore these points.

Gene Expression and Pathways

2.0 Units

Knowledge of how gene expression is regulated is essential to understanding cellular structure and function, both in normal cells and in the disease state. This course provides a solid foundation in the molecular concepts and cutting-edge technologies that are central to the study of gene expression pathways in simple cells (prokaryotes) and complex multicellular organisms. Topics include:

Basics of gene structure and gene regulatory elements- both cis and trans

Transcriptional control of gene expression in prokaryotes and eukaryotes

Post-transcriptional and translational control of gene activity

Molecular techniques for studying gene expression

We will discuss abnormalities in gene expression pathways and how they relate to human diseases, including viral, immune and metabolic diseases, as well as cancer. We will also discuss the latest methods used to manipulate, monitor and analyze gene expression levels in cells and whole organisms, and the relevance of these techniques to research, drug discovery and diagnostic medicine.

Genomics and Next Generation DNA Sequencing: Methods and Applications

3.0 Units

Next Generation DNA Sequencing (NGS) has made it possible to sequence a human genome at an incredibly low cost, vastly expanding the potential applications of genomics in cancer diagnostics, pathogen identification, forensic human identification and genetic disease diagnosis. This course begins with the basics of this revolutionary process and then delves into specific applications of NGS in research and clinical settings. The course covers the primary methods used for highly parallel sequencing. You will develop the knowledge needed to perform analyses from sample prep to generating the final data. Skills needed: Completion of "Bioinformatics Tools, Databases and Methods or Experimental Methods in Molecular Biology" is recommended.

Global Medical Device Submissions and Strategy

1.5 Units

The global nature of the medical device industry presents both opportunities and challenges for medical device companies and regulatory affairs professionals who must navigate a diverse regulatory terrain. Through interactive lectures and facilitated group projects, students gain a practical understanding of international medical device requirements and regulations for major and emerging markets around the world, with emphasis on the EU, Canada, Japan, China and Brazil. A comparative approach highlights regulatory and process similarities and differences between countries and underscores the impact they have on global regulatory and business strategies. This course will benefit regulatory affairs professionals who need to help their organizations understand the barriers to entry into global medical device market.

Good Clinical Practices

3.0 Units

Clinical research is governed by a set of broad regulatory requirements, industry standards and recommendations. Interpreting and implementing these “best practice” standards presents a challenge for all the stakeholders involved in human research. This course explores the framework and principles of Good Clinical Practice (GCP) as it relates to the roles and responsibilities of various stakeholders like the FDA, Investigator, Sponsor, IRB and the study subject. Through lectures, homework, quizzes and the final exam, you will gain knowledge of regulations (federal, state and local) and learn to apply the principles of GCP. Professional Credit: CA BRN/LVN Credit--Provider #CEP13114.

Good Manufacturing Practices

3.0 Units

Familiarity with the Good Manufacturing Practices (GMP) regulations is necessary for employees engaged in the manufacture, regulation, quality assurance, and control of drugs and biologics. Through lectures, discussions, and case studies, you’ll gain an understanding of the FDA GMP and Good Laboratory Practice (GLP) regulations. While primarily aimed at the manufacturing, quality control, and quality assurance worker, the course is also useful for regulatory affairs and clinical research professionals, as well as anyone who wants to understand which regulatory controls apply to the manufacture of drugs and biopharmaceuticals for human use.

Professional Credit: CA BRN/LVN Credit--Provider #CEP13114.

Go Programming, Fundamentals

3.0 Units

Go language (golang), often considered the "C for the 21st century," is an open source programming language developed by Google to help build simple and advanced-level software systems. The core strength of golang is its concurrency mechanisms that make it simpler to write reliable software and to exploit multi-core architectures. The golang is a C-like compiled language that offers portability, speed, and modularity, as well as compatibility with C language. The golang compiler can produce an executable binary for many different CPU and GPU architectures without rewriting the application source code and has a built-in garbage collection mechanism. Participants in this class learn to write faster and modular code, for real-world, cloud-based and general purpose applications.

Class assignments and exercises will prepare students to write real world applications that involve web servers, database interaction, and embedded applications. Topics include:

Code compilation

Program structure

Basic data types

Control structures

Composite types

Functions and methods

Interfaces encapsulation

Using packages to reuse code

Goroutines and channels

Concurrency

How to use build in test tools

Skills Needed: Students should have C programming skills. Advanced C is recommended.

Grammar and Style for Technical Communicators

3.0 Units

This class provides students an intensive review of modern English grammar, sentence errors, style, punctuation and how these concepts apply to current practices in technical writing. We will study the parts of speech; common sentence-level errors, such as fragments, comma splices, and misplaced modifiers; and style issues, such as parallelism, passive voice, and wordiness; and punctuation, such as commas, colons, and semicolons.

Please note - this is not an introductory course in grammar. In order to be successful, you should have English proficiency (TOEFL 550 or 80 IBT, IELTS 6.5) as stated in the admissions requirements for UCSC Extension International Programs. This course is rigorously graded for certificate students, so those studying for self-improvement might find it unsuitable.

For Online Sections of this course: Online courses are largely self-study with instructor support through threaded discussion groups, email and sometimes scheduled online chats. Some instructors may allow students to pace themselves following the published syllabus, enabling them to accelerate through the material and finish early. However, all students must complete and submit all assignments by the schedule end date. Grades are issued for the entire class approximately two weeks after the scheduled end date.

Graphical Production for the Web

1.5 Units

Get fresh ideas, techniques, and sound advice - this class covers the creation of Web graphics using professional digital imaging tools and responsive design principles. Photoshop is the primary focus of the class, but other programs, such as Adobe Edge Reflow and Illustrator, will be explored. Through lecture, lab based instruction, and step-by-step projects, students will learn the workflow for creating graphic components—from page layouts at different viewport sizes, to navigation and animations - along with efficient production strategies that will save time and effort. Beginning to intermediate Web designers and developers, and those already familiar with Photoshop who would like to apply their skills to the Web, will benefit from this course. Topics include:

Know when to use GIF, JPEG and PNG compression

Work with color; understand color spaces and color profiles and their implications for web design

Understand screen pixel density and its implications for designing comps and producing graphics

Understand accessibility issues related to visual design

Understand graphical production as it relates to the Web project life cycle

Know how to use web-based fonts in layered comps, and how to specify type for web pages

Create web backgrounds

Create web page prototypes and wireframes

Work with Layers, Layer Groups, Layer Styles, & Layer Comps for interaction design

Know best practices for structuring a Photoshop comp

Design navigation elements

Extract assets (images and code) from the Photoshop comp

Create images for CSS sprites

Apply graphic design to a wireframe

Create Actions for repetitive graphical production tasks

Create web galleries and slideshows using Adobe Bridge

Understand the difference between designing for static web pages vs. content management systems

Understand responsive design principles and how they relate to graphical production for the web

Understand naming conventions for image resources

Use Adobe Device Previw to create visual designs for multiple viewport widths.

Skills Needed: Familiarity with HTML and hands-on working knowledge of the Mac and/or Windows environment are required. This advanced class assumes that the student has mastered foundation skills as noted on the Photoshop Skills List . Competency in these skills will be essential to completing assignments and keeping up with the pace of the class.

Graphic Design Fundamentals

2.0 Units

If you need to make design decisions for presentations, Web pages or printed materials and you want your final product to be professional and effective, this is the class for you. This course will provide you with the basic skills used by designers everywhere. Through lectures, discussions, slides, critiques and hands-on projects students will learn to set a strategy for any given project, ideate via thumbnail sketches, select appropriate imagery and typeface, all while keeping the brand and project constraints in focus. This course is highly recommended as a foundation for anyone interested in taking web design courses, especially Visual Design for the Web. This course emphasizes visual problem solving skills and not computer instruction.

Topics include:

Overview of typography

Overview of color theory

Overview of layouts and grids

Overview of image selection

Note(s): Students must have access to a computer with Microsoft Office and/or Adobe Illustrator and/or Adobe Photoshop for homework assignments. (Similar drawing or photo manipulation software is also acceptable.)

Hazardous Waste Handling and Awareness Training

0.7 CEU's

Businesses that store or use hazardous materials must provide annual training for all employees in the safe and proper handling of hazardous waste under Title 22, Section 66265.16, California Code of Regulations. This specific training program was designed to meet the personnel training in hazardous waste management requirement in the California Code of Regulations. Topics include:

Federal and state regulatory structure

Steps for identifying a hazardous waste

Documentation, manifesting and labeling

On-site handling requirements for hazardous wastes

Contingency planning, emergency response, and spill reporting and recording procedures

Liabilities for improperly handling hazardous waste

Professional Credit: CSPs can claim COC points 0.6

High Efficiency Switch-mode Power Supply, Design Overview

3.0 Units

The power supply is a critical component in any system and has a major impact on overall reliability. System designers need to understand the designs and requirements of their power supplies to meet the evolving needs of the system, and to satisfy regulatory requirements for energy efficiency and standby power. This course covers both analog and digital switch-mode power supplies. This course starts by introducing the fundamental concepts of a real switch-mode power supply and its functions, operations and interactions. Discussions will cover the various topologies as they relate to power supply operation, design, component selection, and rating for a particular application. The course focuses on the most popular topology: the Flyback converter. The case study includes the clamp, snubber networks, transformer, and EMI filter. You will learn the design considerations for EMI, thermal management, and product safety with detailed discussions of PCB design. Lastly, the course discusses the challenges of power supply development in the face of evolving system requirements and regulations. You'll learn how to meet requirements of high efficiency, high power density, digital control and reporting, and stringent ultra-low no-load standby power. The course has expanded practical discussions of digital implementations of a real switch-mode power supply with added features, enhanced performance, and programmability.

You'll gain practical power supply design knowledge and skills relevant to your hardware engineering environment and be able to satisfy actual market and regulatory requirements with practical component implementations. The course features live demonstrations and waveform observations of power supply behaviors using state-of-the-art solutions.

Topics Include:

Fundamentals of power supply

Types of power converters and their operation

Power factor corrections

Understanding system power architecture

Modern design techniques for high density and high efficiency switch mode power supplies

Reducing ultra-low/no-load standby power and improving low load efficiency

Using digital technology to enable programmability and reporting/communications with the system

Using digital technology to enable full digital control

Environmental and safety standards applicable to power supplies

Practical design of a switch mode power supply with hands on testing

Skills Needed: Knowledge of electronics and basic understanding of an electrical system design with power supply.

HR Technology - What You Need To Know To Be A Technology Proponent

1.5 Units

There are many powerful technological tools available to the human resource professional. This course will help you understand how to effectively use and leverage them. Over the years, HR technology has evolved and expanded beyond the HR Information System (HRIS), a central database of employee information that allowed the company to maintain and report basic employee data and supported automation of functional transactions. Today there are many specific purpose systems, all-in-one systems, and new technologies to consider when determining the optimal technology roadmap for your organization.

To be effective proponents of technology, HR professionals must be able to access, advocate, analyze, and align technology for information, efficiency, and relationships. The course will examine specific purpose systems such as applicant management, compensation planning, performance management, and learning management. By the end of the course, you will be able to articulate the evolution of HR technology and value in organizations and develop a technology roadmap for your company, including system requirements, a review and selection (RFP) template, and a system implementation and launch plan.

HTML5: The Living Language

3.0 Units

An increasing number of companies are using HTML5 to develop web and mobile applications. This course will acquaint you with the new standard of HTML. Through a combination of hands-on exercises and lectures, you will explore the evolution of HTML, XHTML and HTML5, and learn about the many new features available in HTML5. The course de-mystifies HTML5 and all of its long-awaited and powerful features. You will gain experience with redefined web forms, new extended audio and video controls, new page structures and syntax. You will learn and practice "meaningful markup", new canvas drawing methods, drag and drop, data storage methods, new JavaScript and CSS3 implementations, as well as geolocation and mobile application frameworks.

The course includes a series of in-class exercises and lessons with homework. By the end of the

course you will be able to build cutting edge web content, support multiple viewers and browsers, and determine what the best applications are for your web and mobile projects.

Topics include:

History of HTML

What is HTML5?

New structure and syntax

Managing browser history

Web forms revisited

The new canvas - graphics and animation

Drag & drop

Audio and video

Local storage & offline applications

Multiple screen support

Geolocation

Mobile application fundamentals

Skills Needed: “HTML Fundamentals” and “Designing with Cascading Style Sheets: Fundamentals” are required. "Introduction to Web Programming: JavaScript and PHP” and “Designing with Cascading Style Sheets: Advanced” or equivalent experience is recommended.

HTML Fundamentals

2.0 Units

In this hands-on course, students learn to create Web pages using HTML (HyperText Markup Language), the foundation for all Web sites. The course covers the fundamental concepts of hand-coding a Web page using HTML. It discusses all the major topics of coding and validating HTML, including techniques for meeting current standards and practices set aside by the World Wide Web Consortium (W3C), as well as accessibility mandates as set by the American Disability Act (ADA) Section 508 and tips for improving search engine optimization (SEO). Students will learn how to format text, insert images, link to other Web pages and sites, and create forms and data tables. The course discusses different versions of HTML, defines XHTML and demonstrates how it is written. The instructor will address how HTML 5.1, the latest version of HTML, builds upon HTML 4.01 and XHTML, including what new elements have been introduced and are supported by current browsers. Throughout the course, the code will be taught and written to reflect today.

The course is for students who have not previously coded Web pages, or those who would like to review and update their HTML coding skills to meet current practices and standards.

Topics include:

What is HTML – a little history

Understanding the different versions and types of HTML (the doctype)

Deprecated tags and attributes

Optimizing your pages for search engines (SEO)

Best coding practices for accessibility

Importance of good title and meta tags

Block level and inline level elements

Phrase elements and character entities

Ordered, unordered, definition and nested lists.

Incorporating images into your web page

Creating links including: Absolute, relative, e-mail and anchor hyperlinks

Image mapping

Data tables

Understanding and create functional iframes

Coding a form for surveys including radio buttons, checkboxes and comment fields

Validate HTML/XHTML pages

New elements of HTML5.1

Skills Needed: Ability to use Web browsers, navigate Web pages, download files, create folders, and save files (file management/organization) either on Mac or Windows environment. The course recommends using Notepad++ on Windows or TextWrangler on the Mac, both of which are free.

Human Factors and Usability in Medical Device Development

2.0 Units

Understanding and applying human factors is essential to ensuring product usability and user satisfaction. More importantly, consideration of human factors during the design and development of medical devices helps to ensure patient safety by minimizing the risks introduced by user error. This course begins with the fundamental principles of human factors and builds on that foundation each week to cover core concepts and demonstrate how human factors fit into the larger context of medical device software and hardware development. Lessons address the integration of human factors and usability into the product development lifecycle, regulatory considerations, including applicable FDA guidance and standards (ANSI/IEC), and human factors methods. The course is beneficial for professionals who already have a basic understanding of risk management and quality systems, as well as a broad range of technical professionals, including those with no prior medical device experience.

Human Factors for Technical Communicators

2.0 Units

Human factors, the art and science of designing for people, is a fundamental building block for anyone developing content and products---especially interactive, online content. Through lecture, individual and collaborative exercises, discussion, and demonstrations, this course provides a basic grounding in the psychology of users and how they access, learn, and remember information, including: How people sense and perceive the world around them

The capabilities and limitations of human memory

The impact of colors, shapes, and patterns

Various learning styles

Approaches and obstacles to solving problems and making decisions

The course also describes how these factors impact the information-architecture and design tasks of technical communicators.

The course is designed so you will learn to think critically about your audience of users and how design should reflect key cognitive processes, including:

Understand the importance of human factors to information and product design

List the primary human factors that affect information and product design

Describe how each factor might suggest or constrain a design

Evaluate interactive products and describe defects in terms of human-factors violations

The course project provides an opportunity for you to learn key stakeholder communication skills critical to building credibility, content leadership skills; and defending design decisions or presenting a business case for funding.

Human Physiology in Health and Disease

3.0 Units

This course introduces the fundamental principles of human physiology in health and disease, and provides insight into emerging and established therapies used to treat a range of disease processes. Designed for individuals who lack formal medical training, the course introduces the hierarchical organization of the body, from cells to coordinated organ systems, and continues with a discussion of the key integrative/homeostatic control mechanisms. With these topics as a foundation, the instructor progresses through the functions of major systems, including renal, cardiovascular, respiratory, neuromuscular, digestive, endocrine and reproductive. This course

benefits clinical research, biopharmaceutical, and engineering professionals who need a basic understanding of the physiological processes and therapeutic approaches that underlie the biomedical projects or clinical trials on which they work.

Human Resource Management Certificate Completion Fee

Once all of the certificate requirements have been met and your final grades are posted, please access your Student Portal to enroll in the “Certificate Completion Fee” to begin the review process. Please allow 4-6 weeks to receive your certificate.

Human Resource Management, Introduction

1.5 Units

Human resource management is a rapidly evolving profession. This seminar provides an in-depth exploration of modern HR and the role it plays in an organization. Designed for those who are new to the field, the course covers HR basics through lectures, class discussions and a team exercise. You will learn the fundamentals of HR functions and specialties, including workforce planning, compensation and benefits, training, talent acquisition, employee relations, and the latest theories in human resources.

Topics include:

Organizational development

Staffing

Company culture

Recruitment

Reductions in force

Conflict resolution

Laws and regulations

Human Resources Business Partner (HRBP) Excellence

1.0 Units

The 3-session Human Resources Business Partner (HRBP) Excellence course provides a comprehensive personal and professional development experience for the student who is either currently an HR Business Partner or aspiring to develop the skill set to grow into this role. Course participants will have the opportunity to take a "deep dive" into the craft of HR business partnering, explore the competencies required to become effective, and plan to reach heights of excellence in their current or future HRBP role. The HRBP Circle of Excellence Framework combined with the HR Functional Competency Dimensions will provide stimulating and robust content and insights for the student; all of which can be practically utilized on the job. As part of the program, every participant will have the opportunity to construct their individualized “action-oriented” development plan with respect to the knowledge, skills and abilities as detailed in the HRBP Excellence Framework.

The course will begin with a self-assessment based on the HRBP Excellence framework. Following this, targeted personal goals for development will be identified. An authentic HRBP case study will be analyzed by teams of students; including an interactive discussion and culminating in a presentation of their findings and recommendations out to the whole class. In addition, students will work in these same teams (using a study group approach) on a final project to be presented out to the whole group in Session 3. The final project will entail identifying real-life HRBP issues and challenges, selecting the most compelling scenario and then conducting a comprehensive analysis, applying the HRBP Circle of Excellence framework and functional competencies to the selected scenario (s). This project will be graded.

ICH Quality Guidelines: Intent and Overview

2.0 Units

Consider what it takes to create a safe, effective, high quality pharmaceutical product that complies with global International Conference on Harmonization (ICH) Quality Guidelines. In this course, students review each guideline pertinent to drug development, patient safety, health authority review, and commercial manufacturing. This uniquely robust overview provides an understanding of the regulatory intent, helping to prepare professionals for competitive job roles in San Francisco Bay Area biopharma. While primarily aimed at R&D;, manufacturing, quality control, quality assurance and CMC-regulatory professionals, the course is useful for anyone who wants to understand harmonized quality guidelines and development strategies.

Immunology, Principles

3.0 Units

Immunology involves a complex network of interacting molecules and cells that function to recognize and respond to foreign agents. It also has wide-ranging implications for the pharmaceutical, healthcare and biotechnology industries. This course provides the fundamental principles of immunology, along with recent developments and their implications for drug discovery and development, as well as disease treatment. Topics include:

Innate, humoral and cell-mediated immunity

The clonal selection of lymphocytes

Antigens, antibodies and their interactions

Antibody gene rearrangement

Lymphocyte development

Aspects of clinical immunology such as inflammation

The immune response to bacterial, viral, fungal and parasitic diseases

Vaccines

AIDS and other immunodeficiencies

Autoimmune diseases

Allergies

Transplantation immunology

Cancer

The course highlights immunological techniques important in research and clinical laboratories. This course is intended for researchers in biotechnology or pharmaceutical companies, nurses, and others interested in gaining a background in the fundamentals of immunology. It has been specifically designed both for those who are new to immunology and for those who already have some understanding but wish to update their knowledge.

Professional Credit: CA BRN/LVN Credit--Provider #CEP13114.

Implementing Marketing and Sales Strategies

2.0 Units

In this introductory course students gain an integrated view of marketing and sales strategies by studying the concepts, framework, and techniques behind great strategic decisions. Learn how firms establish sustainable competitive advantages and develop customer strategies amid risk and uncertainty. You will see how to develop cohesive marketing and sales strategies to support revenue generation. Investigate key steps of the sale process, how buyers react at each stage, and the marketing tools that have increased the sophistication, productivity, and pace of selling. Course Objectives:

Describe corporate and business strategies Develop sustained competitive advantages Apply selling strategies to systematically convert prospects into customers Maintain customer relationships to maximize long-term profitability

Income Tax Accounting

4.0 Units

This course examines current federal revenue law as related to individual income taxation. It covers sole proprietorship and small business taxation as well as real property transactions, with emphasis on issues relating to all aspects of individual taxation. Particular attention is given to the effects of the current tax law, including capital gains and losses, adjustments to gross income, itemized deductions, tax credits, tax payments and estimated taxes. This course implements practical application of tax law through preparation of tax forms and planning for individuals.

Income Taxation in Personal Financial Planning

3.5 Units

Designed for students intending to become financial planning professionals, this course focuses on the interrelationship between common income tax rules and planning techniques that are applicable to individuals.

Topics include:

Income

Deductions

Credits

Sales and exchanges

Real estate transactions

Compensation planning and stock options

Retirement plans

Business entities

Overall coordination with the individual's financial plan.

Information Architecture and Design Basics

1.5 Units

An introduction to the architecture and design of online information, this course focuses on information used in information-rich user interfaces (including multimedia, software products, and software interfaces within hardware products), product help, and websites. The course covers the process and techniques of information architecture (structure, organization, and navigation) and design (information typing and how those types are best presented). It also covers the technologies used to create the underlying infrastructure for presenting online information and the tools used for developing information using those technologies. In keeping with the theme of the course, all homework must be created using Web-based technologies and delivered electronically. Lectures, computer demonstrations, group discussion and exercises cover the past, present, and future of online information development; the process of developing online information; basic information architecture and design concepts; basic user interface and interaction design concepts; an introduction to Web-based technologies with an emphasis on HTML, and the benefits and constraints of those technologies related to online information development; and a demonstration of the tools most often mentioned in Bay Area job postings.

Required Prerequisite: "Developing Technical Information from Plan to Completion" or instructor's approval with equivalent course work or experience.

Information Security Essentials

3.0 Units

Information Security Essentials is an interdisciplinary approach to modern information security, covering data, network, Web services, end-point and an introduction to cloud computing security. The explosion of mobile devices has impacted significantly digital and telecom networks; this shift

has challenged the limits of traditional data, network and security schemes. The consolidation and virtualization of systems in years past has changed the architecture and topology of networks, not to mention the monolithic security systems in the data center where physical and logical security is integrated. This course provides a holistic end-to-end view of modern information security and covers the current state and evolution of data, network, Web services and end-point security by using real case studies. The course introduces data security technologies in evolution from symmetric/asymmetric encryption to secure key management, Key Management Interoperability Protocol (KMIP), global standards and Certificate Authorities (CA). It covers network security from the LAN, WAN and Secure SAN perspective and analyzes Web services from email phishing trends to the risks of social engineering and social media. You'll learn about mobile exploits on the server and the client side, as well as the new security trends in enterprises with Virtual Desktop Infrastructure (VDI) and Bring Your Own Device (BYOD). In all cases, you'll learn about security challenges, management techniques and best practices. Each major topic includes real-world case studies with analysis and quantification of the breaches.

The course concludes with an introduction to cloud computing security and future trends in security products. You'll discuss a security product in use in the industry today that incorporates the comprehensive security features mentioned in the course.

Prior to enrolling, you should have basic knowledge of data encryption, networking and storage systems. By the end of the course, you'll understand the security challenges, security models and technologies available in the market today to solve these challenges.

Topics Include:

Integrated security fundamentals and trends

Data security

Network security

Web services security

End-point security and introduction to cloud-computing security

Product case study

Skills Needed: Solid knowledge of networking and data management is required.

Information Technology Certificate Completion Fee

Once all of the certificate requirements have been met and your final grades are posted, please access your Student Portal to enroll in the "Certificate Completion Fee" to begin the review process. Please allow 4-6 weeks to receive your certificate.

Instructional Design and Delivery, Introduction

1.0 Units

Careful planning is the first step in designing a strong instructional program, but a syllabus alone is not instruction until it's "delivered" to the students. The designer's first step consists of integrating expected outcomes with knowledge of adult learning theories, learning styles, and student needs. What should the students be able to do, say or think after instruction, at what level of proficiency, and under what conditions? How will the designer create opportunities for students to experience

the content, practice the skills, and achieve competence? Most importantly, what will the students actually do as they engage in instructor-led sessions, self-paced sessions, or combinations of the two? Participants in this course will practice face-to-face delivery, focusing on effective presentations and group facilitation skills (i.e., getting students engaged in active discussions). Participants will also practice delivery through remote channels, such as voice and video conferencing and Web-based meetings. Finally, participants will strive to find the most effective balance between instructor activity and student activity, matching these activities to the expected outcomes.

Instructional Design and Delivery, Practicum

2.0 Units

In this capstone course, participants synthesize and field-test the elements of solid instructional design and delivery. With the instructor as coach, participants field-test segments of at least one course or training program designed in the certificate core courses. Most participants will present before authentic audiences (e.g., a corporate or government group or a university or college class). The focus remains on learning objectives, student outcomes, instructor self-reflection, feedback loops, and principles of continuous improvement. Participants enrich their courses and programs while practicing professional habits. Course activities include a review of participant portfolios that demonstrate professional competencies to design and deliver instruction and/or training.

Instructional Design Certificate Completion Fee

Once all of the certificate requirements have been met and your final grades are posted, please access your Student Portal to enroll in the “Certificate Completion Fee” to begin the review process. Please allow 4-6 weeks to receive your certificate.

Instructional Needs Assessment and Evaluation

1.5 Units

Designed for an in-depth, systemic examination of instructional needs, this course builds the skills needed to plan and implement assessment and evaluation as they play out in corporate training and college and university settings. Best practices at the organization and program levels--although different in scope--share key characteristics: They promote high expectations; address problem-solving; align with objectives; determine methods and tools; respect diverse talents and learning styles; and improve the knowledge, skills, and performance of individuals, groups, and organizations. Other topics in the course include methods (e.g., performance-based, self-assessment, portfolios, teamwork, field work) and ways instructors can conduct self-assessments (e.g., teaching or training portfolios). Participants apply assessment and evaluation principles to their work or teaching setting and share results with the class.

Integrated Marketing Communication

2.5 Units

A proper integrated marketing communication plan is the best way to reach your appropriate target market with consistent messaging in a cost-effective and measurable way. This course shows you how to develop an effective blend of public relations, advertising, internet marketing, direct marketing, personal selling, incentives and other marketing tools, so that they all convey a consistent message. Geared for students both on the client and agency side of marketing communications, you will learn from practical in-class team exercises, discussions, case studies and project presentations how to develop a plan and budget with a good return on investment. Upon completion of this course, you will be able to: Explain the manager's role in the marketing communication process Determine marketing communication objectives versus general marketing objectives Properly identify the key messages for your target markets Know and use the criteria for developing creative materials Evaluate and integrate all the various marketing communication tools available Select the appropriate traditional and modern digital media channels Develop integrated budgets using the "Task Method" Develop and implement measurement and feedback processes.

Interacting with the FDA

1.5 Units

Regulatory affairs professionals interact with the U.S. Food and Drug Administration (FDA) throughout the life cycle of a biomedical product. Lectures, case studies and roleplaying are used to explore the range of interactions that industry has with the FDA, including inspections and key meetings. Students learn how to prepare for these important events. This course highlights the structure, mission, jurisdiction and roles of the FDA, reviews centers within the agency, and the field offices, and examines key societal, political, industrial and biomedical drivers that impact policies, priorities, and the current U.S. regulatory environment. This course benefits new and experienced regulatory professionals and anyone who interfaces with the FDA.

Intermediate Accounting I

4.0 Units

This intermediate-level course is designed for participants specializing in accounting. Through lecture and exercises, it covers the theory and application of accounting. The course emphasizes revenue recognition, current assets and liabilities, and fixed asset accounting. There will be quizzes and tests designed to reinforce these concepts.

Intermediate Accounting II

4.0 Units

This intermediate-level course covers the theory and application of accounting. Through lectures, readings and course exercises, this course covers investment accounting, bonds, pensions, leases and earnings per share.

International Business and the Global Economy

3.0 Units

This course will introduce students to international business environment within the global economy. The course will leverage the lessons learned from business economics and will introduce students to non-economic factors influencing an international business in the global economy. The course will provide different international business scenarios through small case analysis. The course will draw business insights from various background such as ethics, culture, and political economy.

Internet Programming & Development Certificate Completion Fee

Once all of the certificate requirements have been met and your final grades are posted, please access your Student Portal to enroll in the “Certificate Completion Fee” to begin the review process. Please allow 4-6 weeks to receive your certificate.

Interviewing for Success: Using Structured Interviewing Techniques

0.5 Units

Students in this course will improve their interviewing skills and evaluation techniques through discussion, lecture, role-playing and videotaping so they can make more effective candidate selection and hiring decisions.

While this course is focused on the needs of staffing professionals, managers, and supervisors, other employees and even students who are active in the job market will gain distinctive interviewing skills.

Discussion topics include how to prepare job descriptions; review resumés quickly and accurately; plan, control, evaluate, and document the interview; and use effective questioning techniques in the interview process. You will study specific skills for behavioral, technical, and executive interviews, conducted by telephone, in person, or via videoconference.

Learning Outcomes

At the conclusion of the course, you should be able to: Conduct an effective, legally compliant, initial phone/video screen of selected candidates;

Apply a structured, flexible interviewing process, using four-phase, nine-step model presented in class;

Prepare and execute a resumé-based interviewing agenda to elicit decision-making information;

Use effective, job related behavioral, situational, self-assessment and open-ended interview questions;

Evaluate a candidate’s behavioral evidence from interview against the job requirements; and

Identify non-compliance risks related to federal and California law and legal guidelines for interviewing.

Note(s): HRCI--PHR, SPHR and GPHR general recertification credit is pending.

Introduction to Accounting I: Financial Accounting

4.0 Units

This course covers the fundamentals of financial accounting as well as the identification, measurement and reporting of the financial impacts of economic events on enterprises. Through lectures, readings and class exercises, the following topics are addressed: accrual account concepts; transaction analysis, recording and processing (journals and ledgers); preparation, understanding and analysis of financial statements (income statement, balance sheet and cash-flow statement); accounting for sales and cost of sales; inventory valuation; valuation and depreciation of operational assets; analyzing liabilities and stockholders equity transactions; and financial statement analysis.

Note(s): MCLE--Minimum Continuing Legal Education State Board of CA.; HRCI--PHR, SPHR and GPHR strategic recertification credit.

Introduction to Accounting II: Managerial Accounting

4.0 Units

This course covers managerial accounting and how to evaluate cost-accounting data in order to help management do its job effectively in the areas of planning, control, motivation, communication, evaluation of performance and decision making. Accordingly, topics include traditional and activity-based costing, standard costing, relevant costing, variable costing, cost-volume-profit analysis, short- and long-term budgeting, alternative decisions, performance measurement, responsibility accounting and transfer-pricing. Note(s): MCLE--Minimum Continuing Legal Education State Board of CA; HRCI--PHR, SPHR and GPHR strategic recertification credit.

Introduction to Machine Learning and Data Mining

3.0 Units

Machine learning and data mining are at the center of a powerful movement. Many industries depend on practitioners of machine learning to create products that parse, reduce, simplify and categorize data, and then extract actionable intelligence from that data. Professionals who are familiar with machine learning, a key technology driving Big Data, secure a competitive edge in exciting careers in the data sciences. In this course, you will learn machine learning concepts, terms and methodology, and gain an intuitive understanding of the mathematics underlying it by building actual applications. The machine learning algorithms you'll learn can be used in real-world applications such as search engines, image analysis, bioinformatics, industrial automation, speech recognition, and more. This course establishes a basic understanding of supervised learning and Bayesian classifiers using the histogram as a starting point. It then covers the design and application of practically useful classifiers such as k-nearest neighbors, linear machines and decision trees. You will also learn concepts in unsupervised learning and clustering algorithms such as expectation maximization and k-means clustering. The course concludes with the application of neural networks in machine learning.

The course uses examples to guide you through foundational concepts, often employing live algorithms to facilitate visual understanding. Pseudocode will be provided for most of the algorithms covered. You are encouraged to use the pseudocode as a reference to create your own programs using any language you choose. In-class quizzes are utilized to gauge learning and group activities including discussion. Homework assignments are designed for in-depth practice.

Topics include:

Histograms and Bayesian classifiers

Principal component analysis

Linear classifiers and regression

Classifier performance evaluation

Expectation maximization algorithm

K-Means algorithm

Hidden Markov models

Ensemble learning and Decision trees

Neural networks

*** Skills Needed: Moderate computer programming ability in a programming language like Python, R, C++, Java, or Matlab. Elementary understanding of probability and statistics. Familiarity with basic programming constructs like variables, arrays, accessing elements in arrays, arithmetic, logic, branching, looping, strings, input/output, functions, and visualization.**

If you are new to programming, it is recommended that you learn the fundamentals of programming in either Mathematica, Matlab or Python before enrolling in this course. A great free resource for learning Python can be found by searching "Microsoft edX Introduction to Python for Data Science".

Introduction to Online Teaching

2.0 Units

Technology has dramatically affected many aspects of our lives, including the areas of teaching and learning. Some teachers can be overwhelmed, while some students seem to take it in stride, and vice versa. In this survey course, you'll explore how online technologies have changed the way instructors and students interact and how that interplay may change in the future.

Introduction to Robotics

2.0 Units

Learn to program a robot in our new crash course on the fundamentals of embedded systems and explore a career in robotic technologies. After a gentle introduction to the history of robotics and its current applications, students in this robotics course learn to program a small, two-wheeled robot and gain an overview of some of the more complex concepts such as control systems, localization, and vision. Explore robotic building blocks like analog to digital converters (ADC), digital to analog converters (DAC), steppers, finite state machines (FSMs), and functional reactive programming (FRPs). Although just an overview, this first robotics course will give you a taste of programming embedded real-time systems and help you find out if you want to explore a career in the expanding robotics industry.

Topics Include:

A brief history of robotics

Embedded systems fundamentals

Code development, including strict timing constraints and interrupts

Simple sensors and actuators

High level dynamics of a two-wheeled robot including projects

Complex concepts in control systems, localization, and vision

Current applications

Skills Needed: Basic C programming ability and a knowledge of fundamental Algebra.

Notes: Students need to purchase a Pololu 3pi Robot kit for project assignments. Approximate cost: $125. https://www.pololu.com/product/975

Introduction to Web Programming: JavaScript and PHP

2.0 Units

A dynamic website goes beyond HTML and CSS; it typically involves JavaScript and PHP. JavaScript is primarily used on the client-side through the browser to alter displayed document content with user interactions. PHP (Hypertext Preprocessor) is an open-source scripting language installed on Web servers. It is integrated with HTML, interfaces with databases and processes data based on user input. This course introduces the basic concepts and programming skills that you need to know to program dynamic Web pages. It does not cover all features of JavaScript or PHP. The course showcases and analyzes demos of dynamic Web pages that use JavaScript and PHP. It covers basic programming syntaxes such as variables, data types, strings, expressions and operators. You'll discuss functions, events, decision-making and repetition for both languages, and you'll learn to build forms and objects, take inputs and reset forms. When using PHP for server-side scripting, you'll learn to handle user input and process form data, creating an all-in-one form.

The instructor will provide examples of code to facilitate learning. At the end of the course, you'll have a deeper understanding of the dynamic Web and be able to analyze and handle basic coding. You'll notice the difference between a static webpage and a more interactive and dynamic page that uses PHP and JavaScript.

This is an introductory course. It does not cover object-oriented features, document object model (DOM), cookies, or databases.

Topics include:

Elements of dynamic websites

Introduction to JavaScript

Variables, data types, expressions, operators, and strings

Working with functions, events, decision-making, and repetition

Form elements and objects, input fields, selection lists, submitting and resetting forms

Creating basic PHP scripts and building expressions

Handling user input, processing form data, creating an all-in-on form

Skills Needed: HTML and CSS coding experience are required. If you have experience with object-oriented languages such as Java or C++, the pace of the course may be slow. You may consider "JavaScript and AJAX, Comprehensive" (course IPDV.X405) instead.

Investments in Personal Financial Planning: Principles and Methods

4.0 Units

This course provides a comprehensive overview of investments through readings, case studies, problem-solving exercises and discussion. This balance of practical application and theory should be useful to both the practitioner and the investor. The course emphasizes the structure, regulation and operation of investment markets; understanding modern portfolio theory, asset allocation and risk control; detailed analysis of fixed income, equity and derivative investing; portfolio design and construction; fulfilling fiduciary responsibilities; and investment performance measurement and reporting.

IO Concepts and Protocols: PCI Express, Ethernet, and Fibre Channel

3.0 Units

Ever wondered what makes the IO system of a modern computer tick? Wanted to know more about PCI Express, Ethernet, and Fibre Channel, and how they all fit together? This course will help you understand the ins-and-outs of the IO technology. Traditional operating systems courses have treated IO superficially. This course focuses on IO technologies, and walks students through the complexities of IO subsystems in modern computer and networking systems. After an introduction to the basic concepts of IO, we will look into deeper aspects regarding the most prevalent IO interconnect: PCI Express. We will study the need for PCI Express, its evolution from PCI/PCI-X, and the details of the protocol. We delve into address spaces and cover how devices are discovered and configured. We will then switch our attention to south side interconnects such as Ethernet and Fibre Channel. We will discuss their operation and, in the case of Fibre Channel, how targets are discovered and configured. Finally, we will tie everything together.

The course will comprise 10 lectures, homework assignments, and tests. By the end of the course, students would have a broad idea of how IO works in a modern computer system and be better prepared to learn about writing device drivers or troubleshooting IO problems. The course does not cover chip or board design aspect of the IO.

Topics Include:

Modern computer architecture in block diagram format

Flow of an IO request

IO concepts: MMIO, DMA, interrupts

Introduction to PCI Express, evolution from PCI, PCI-X

Address spaces: configuration, memory, IO

Device discovery

How MMIO, DMA, and interrupts work in PCI Express

Introduction to Ethernet: CSMA/CD, frame format, VLANs, aggregation

Introduction to Fibre Channel: topologies, N-port IDs/WWPNs, logical units, frame format, SCSI request mapping, target discovery and configuration, security, FCoE

Further topics to explore - lead in for future courses

Skills Needed: An introductory course or practical experience with operating systems internals, an introduction to computer architecture and organization, and systems programming experience.

IO Design Fundamentals

3.0 Units

This course is an introduction to IO interfacing from one platform to another at both chip and board levels. With today's chips running over 1GHz, inter-chip communicating is often a limiting factor of the system. Examples of high-speed IO are HDMI, USB 3.0, and 100Base-T.There is no single solution and over the years numerous approaches have been taken, including lowering logic voltages, using differential signals and optical interfaces. The course reviews the various approaches that have been taken in the last two decades, and covers the advantages and disadvantages of TTL, CMOS, low-voltage CMOS, LVDS and optical, from the perspective of speed, power, cost, and complexity.

The course emphasizes fundamental concepts such as transmission line analysis, slew rate, termination, etc. It introduces the basic IO logic, timing analysis and package model, and covers bit error rate, bi-directional IO and decision feedback filters. It does not cover complete circuit designs of the latest IO schemes or board design. Because most solutions are silicon-based, ESD (electro static discharge) concepts and techniques will also be discussed. A circuit simulation tool will be offered to students for exercises but its instruction is not part of the course.

Topics include:

Chip interface problems

Transmission line analysis

Basic IO circuits

Various logic families: TTL, CMOS, 3.3 volt CMOS, 1.2 volt CMOS, LVDS

High-speed communications

Common interface techniques and schemes

Timing analysis and package model

Electro static discharge (ESD)

Optical communications

Skills Needed: A basic course in circuit design and understanding of basic electromagnetic physics.

Java Programming, Comprehensive

3.0 Units

Java is the premier development language for Web servers, enterprise servers, network applications, embedded devices, appliances and wireless applications. Java is also an excellent language for manipulating XML data. This course not only covers the Java fundamentals, including basic language syntax, constructs, and the development environment, but also extends to the Java platform, including client/server communication, and managing XML data. The course begins with Java's implementation of object-oriented concepts such as classes, data and function access control, and inheritance. Language syntax and constructs are thoroughly explained. In addition to learning the fundamentals, students will build graphical user interfaces and program in the Java event-handling model. Additional topics include the Java class library, collection frameworks, Internet communication, input/output programming, multithreaded programming, and XML data manipulation.

Upon completion of this course, students will be able to write, maintain and debug applications; make effective use of some of the standard packages; and write object-oriented code using encapsulation, inheritance and polymorphism. This course provides the foundation for professional java programming.

Topics Include:

JDK and eclipse IDE

Object Oriented concept

Language syntax and constructs

Multithreaded programming

Graphical programming and event handling

Input/output programming

Collection framework

Java class library

Java and XML

Skills Needed: "Java Programming for Beginners" is recommended for those new to Java. Experience in a programming language such as C or C++ may also help with learning Java.

Java Programming for Beginners

2.0 Units

This course is an introduction to Java programming for those who are new to the field or need a refresher. The course covers how to apply key programming concepts and use Java programming environment for real world applications. This introductory foundation in Java programming will prepare students to start simpler programming projects for applications. The course begins with programming concepts and Eclipse IDE. The instructor introduces basic and intermediate Java syntax, and then methodically addresses abstraction, object-oriented paradigm, procedural programming, elementary data structures, and more. Other useful topics include graphics user interface, collections and generics. Students will gain a strong conceptual foundation in these areas while starting to write programs for real applications.

The course consists of lectures and discussion, with some lab work. Students are expected to complete assignments on their own computers. By the end of the course, students should be able to program in the Java language and will be exposed to many useful programming concepts.

Topics include:

Introduction to programming, JDK and IDE

Data types, inputs/outputs

Strings, arrays, collection and generics

Java programming logic

Object-oriented programming

Graphic programming

Exception and file handling, debugging

Skills Needed: Students should have experience using logic. Some programming experience will be helpful. Ability to install and configure open-source software on own computers.

JavaScript and AJAX, Comprehensive

3.0 Units

JavaScript is primarily used on the client-side through the browser to alter displayed document content or create dynamic Web pages. Together with HTML5, it is becoming a “First Class Language” for cross-platform development, especially for mobile applications. This comprehensive course covers JavaScript as a programming language and includes introductions to open source frameworks and AJAX (Asynchronous JavaScript and XML). You will gain insight on useful Web architectures and build the foundation needed to harness this popular technology for the Web. The first few weeks of the course are devoted to getting up to speed with language syntax, data types, operators, and programming constructs such as if/else, switch statements and loops. You will learn how to integrate JavaScript with HTML/CSS and write functions to handle user-initiated events such as mouse rollovers, clicking on a link, or submitting a form. The course emphasizes JavaScript’s object-oriented capability.

Since every HTML element can be referenced as a JavaScript object, the second half of the course is devoted to creating and manipulating objects such as windows, forms, images, and links with an emphasis on the Document Object Model. You will learn how to walk the W3C DOM tree, manage

nodes and use event listeners. After learning the language, you will be introduced to several open source frameworks to facilitate application development; EXTJS will be used as an example library.

The course also covers how AJAX introduces asynchronous calls using the JavaScript XMLHttpRequest object to handle communication between the browser and the server, and when to use it to enhance user experience. Upon completion of the course, you will be able to write unobtrusive JavaScript programs and use AJAX to create a communication layer.

Topics include:

History and interactions with three layers of a Web page

Operators, data types, functions and variables in JavaScript

Working with objects and arrays, inheritance

Browser and Document Object Model

Forms and programming input devices, validation

Event handling and validation using Regex

Form scripting, interaction with CSS

Introduction to EXTJS and other JS frameworks

Working with AJAX

Skills Needed: Familiarity with basic programming constructs (of a language such as C or Perl) and a working knowledge of HTML are required.

Jitter Essentials

1.5 Units

As the data rate of parallel and serial transmission increases, analysis and characterization of timing jitter are becoming critical to determine the system performance. The unit timing interval of the current system is shrinking and consequently the timing jitter is now occupying a larger portion of a system's overall timing budget. The effects of jitter, which in the past may have been safely ignored, must be managed today to advance system performance. It is therefore necessary to directly relate the jitter performance to system performance in terms of Bit Error Rate (BER). This course is designed for anyone working with jitter who wants to develop a strong foundation and to clearly understand it. Students will learn the definitions of various types of jitter (including phase noise), understand which type of jitter is important to their application and why, learn how to propagate jitter through a system, create jitter budgets, understand the various equipment for measuring jitter, and learn how to minimize jitter. Emphasis will be placed on developing a working knowledge of jitter, such as establishing a common language, understanding jitter beyond the definitions, gaining insight by making simplifying assumptions, and visualizing relationships between different types of jitter. This course teaches the fundamentals of jitter applied to a wide range of products, and is intended for anyone who works with jitter on a regular basis.

Topics include:

Types of Jitter

Sources of jitter

Jitter decomposition

Theory and mathematics of jitter

Jitter analysis in time and frequency-domains

Phase noise and jitter

Jitter and noise duality

Jitter propagation and amplification

Timing budget, total jitter and BER

Industry standards and jitter specification

Jitter measurement methodology

Minimization techniques of jitter

JUnit Test Framework

1.5 Units

JUnit is one of the most popular open source testing frameworks for all types of Java software applications at the unit, integration, functional, and acceptance testing stages of the software life cycle. This course begins with the fundamentals of JUnit, including installation, setup and integration with Eclipse and Apache Ant, two of the major Integrated Development Environments (IDE) that support JUnit. Then the features of JUnit are covered, along with how different versions compare to each other, and how to customize JUnit and create automated tests. Students will learn the real-world uses of JUnit, including test strategies and the concept of Test Driven Development (TDD) also known as "test first, code later." Other advanced topics include testing presentation layer, server side, JPA and database access. By the end of this course, students will have learned to use JUnit to test Java applications in all life cycle stages and will be able to apply this framework to build automation testing.

Topics include:

JUnit fundamentals & setup

JUnit comparison

JUnit customization

JUnit test automation & build process

Test Driven Development (TDD)

Test strategies

Real-world use of JUnit

Skills Needed: The assignment requires coding in Java. The course will not repeat Java programming instructions.

LAMP: Linux Based Web Application Development – Apache, MySQL, PHP

3.0 Units

Linux, Apache, MySQL and PHP, collectively known as LAMP, comprise more than two thirds of servers, databases and scripting languages on the Internet today (by some estimates). LAMP belongs to open-source and is very robust yet available free. Many e-commerce sites and large enterprises have deployed LAMP for commercial use. LAMP tools are constantly updated and improved based on community feedback. LAMP allows users to develop a Web site with rudimentary level of skill with these tools. This course helps you to learn the basics of LAMP including installation, deployment and developing website with most commonly used functionality and database as backend. The students will also learn the basics of programming MySQL (a popular web database) and PHP (Hypertext Preprocessor, a web site scripting language). The course uses case studies to help students relate the teaching material with real world applications. In this class, students will learn theory during lectures and perform practices on their computers to reinforce the concepts and usage of LAMP. Students will be able to develop basic to intermediate level 3-tier Web sites and web applications on their own with a database in the back-end.

Topics Include:

Introduction to LAMP

Linux installation and fundamentals

Linux administration

Apache Web server installation and configuration

MySQL database installation and configuration

PHP interpreter installation and configuration

Introduction to Web technologies

Creating database, PHP language

Creating Web pages

Communication between Web pages and database

Web security

Web hosting by third party

Skills Needed: Basic knowledge and experience with Web site development on Linux or Windows. Some programming experience will be helpful. Students can have the option of learning Apache, MySQL and PHP on Windows platform. Linux platform is preferred but not required.

Language Structure

3.0 Units

Knowledge of language structure and use, with emphasis on language universals and varieties, is fundamental to developing teaching expertise in TESOL and bilingual education. In this seminar, participants review theories and research in linguistics and sociolinguistics related to teaching. Readings, lectures and activities focus on sound systems (phonology), word formation (morphology), grammar (syntax), word meanings (semantics), language in context, written and oral discourse, and language variation. The structure of selected languages and transcription of sounds will also be discussed.

Law and Human Resource Management

2.0 Units

This course outlines the laws and agencies that regulate employment relationships in California and on a federal level. These fundamental labor laws must be understood to prevent or, if necessary, defend against employment litigation and government audits. Topics Include:

Wrongful termination

Employment discrimination under state and federal law

Sexual (and other) harassment

Workplace privacy

Wage and hour regulations

Immigration

Labor unions

Collective bargaining

Strikes and picketing under the National Labor Relations Act

Leaves of absence

Noncompetition and trade secrets

Alternative dispute resolution

Substance use and abuse in the workplace

Affirmative action plans and requirements

COBRA

Independent contractor vs. employee

Workers' compensation and reductions in workforce

Note(s): Professional Credit: HRCI--PHR, SPHR and GPHR strategic recertification credit: 22.5 hours. MCLE--Minimum Continuing Legal Education State Board of CA: 20.0 hours.

Leading People Through Change

0.5 Units

The increasing rate and scope of change is having a profound effect on the workplace. Managers and supervisors often bear the responsibility of maintaining morale and productivity during difficult change processes. Doing this effectively requires grasping the impact of change on people, understanding the change process, acquiring critical coping skills, optimizing the positive payoffs from change, and implementing action plans for leading people through change. You will learn the causes, consequences, and costs of mismanaging change; stages of the change process; fundamental processes in change management; and skills, options, and strategies for harnessing the power of change for you, employees and your organization. You will obtain practical resources and develop a personal action plan for leading people through change.

Lean-Agile Project Management: Achieving Business Value

1.5 Units

This course introduces managing development projects and programs at both the team and enterprise levels using Agile methodologies and Lean principles. Students will study the implementation of Lean and Agile within the Scrum, Kanban and Scrumban project management frameworks. We will also address the business case for agility, lean projects, and becoming a Lean-Agile enterprise. Other topics include the role of management in Lean-Agile development, the kaizen culture, and mapping the value stream and the Kanban/Scrumban methods for accelerating the delivery of business value. Topics include:

Lean principles, the value of agility, minimizing process times, fast flexible flow, value stream mapping and defining value Overview of lean-agile project management methodologies

The Scrum development methodology

Going beyond Scrum with Kanban and Scrumban methodologies

Lean-agile planning and estimating, visual controls, information radiators

Becoming an agile enterprise, including teams and management roles in lean-agile development

Note(s): Professional Credit: Project Management Institute--PMP 15 Professional Development Units.

Lean-Agile Project Management Professional Award Completion Fee

Once all of the professional award requirements have been met and your final grades are posted, please access your Student Portal to enroll in the “Lean Agile Project Management Professional Award Completion Fee” to begin the review process. Please allow 4-6 weeks to receive your certificate.

Learning Theories and Styles

1.0 Units

This course may be eligible for HRCI---PHR, SPHR and GPHR general recertification credit. This seminar for training and learning professionals covers adult learning theories and styles, and allows participants to explore their own learning style/preferences through instruments, discussion and experience, how to be flexible when relating to others' styles, identifying learning problems related to style issues, and resolving these issues are addressed.

Topics include how to incorporate a variety of learning experiences to accommodate different styles when instructing or designing training. Emphasis is placed on assisting participants in the use of creative and effective training methods to reach learning objectives. A learning assignment is completed in class. Discussions focus on application for self, work and the training environment.

Leveraging Content and Social Analytics

1.5 Units

How do product managers, marketers, entrepreneurs and engineers quickly learn to use social data to be more persuasive, refine messaging and illustrate the value of social programs to stakeholders? They begin by building social relationships. They nurture conversations with customers, advocates and influencers who help them build a sustainable revenue stream. In this course, students learn best practices to find customers and implement the three Ms of process improvement: manage, maximize, and measure. Learn to increase engagement and harvest customer leads on leading social media platforms. Practice successful social listening and use analytics to find, track, and measure campaigns. You'll use a listen-first approach, create a brand story, and develop social campaigns on different channels. As a final team project, you will design a social media marketing plan and present it to an audience of industry experts. Some familiarity with social media skills and how to create a Facebook business page is recommended to take this course.

Linux Device Drivers

3.0 Units

Linux is established as a preferred operating system across a wide range of computing environments. The Linux device driver communicates with IO devices as part of the kernel. It has to

support applications and manage data access to the device. This course covers the interfaces to the Linux kernel for writing device drivers, as well as the underlying portability considerations. After a brief review of architecture and driver concepts, the course discusses the design and implementation of device drivers in Linux in both datacenters and embedded systems environments. You will learn about kernel resource management for device drivers, their allocation and deallocation, interfaces to context management and building custom kernels. Topics include character device interfaces, time and timing, memory and address management, interrupt handling and debugging techniques. Other topics include addressing concurrency from a device driver developer perspective; e.g. the impact of CPU hyper-threading and task preemption.

The instructor will share code samples and real-world experiences of device and kernel porting to augment your learning. Your assignments will ask you to analyze, develop and debug different classes of device drivers. You will need access to a Linux environment with root privilege. Any distribution is fine as long as the Linux kernel version is 2.6 and above. Options include VMWare, VirtualBox, LiveCD, disk partition or separate drive.

Topics include:

Review of Linux architecture

Terms and concepts for device drivers

Compiling a custom kernel

Building and running modules

Character device driver concepts

Debug interfaces for kernel drivers and PROCFS

Concurrency and synchronization: primitives and design considerations

Topics in character device drivers: IOCTL, LSEEK, MMAP, scatter-gather IO

Notion of time and timing in the kernel: dealing with fine-granular latencies

Hardware management and interfaces

Deferred execution and interrupt handling

Portability considerations

Block driver interfaces and design

Skills Needed: A basic knowledge of C language programming. "Linux Kernel Architecture and Programming" or equivalent experience is recommended.

Linux Device Drivers, Advanced

3.0 Units

This course will enhance your understanding of the art of writing Linux device drivers beyond the basic device driver course. You will learn how to build and explore a framework that can be used to develop a commercial grade driver. Topics include Linux kernel services and facilities, memory management, network stack, interrupt handling, DMA techniques, and kernel memory mapping. The course focuses on two IO subsystems, PCI and USB, and discusses PCI device configuration space, IO memory mapping, USB Core and Descriptors. The course includes advanced topics such as the unified device model, sysfs file system, concurrency issues on the SMP platform, block layer, bus-independent device access, and kernel threads. The course also addresses the debugging support available in Linux kernel, including live debugging and profiling driver code. The instructor will review code snippets from full-fledged drivers and survey industry trends.

In the final project, you will build a fully functional driver for a PCI or USB Ethernet card. In the process, you will learn to write code to avoid pitfalls. Upon completing the course, you will have acquired advanced knowledge of Linux device drivers and be familiar with practical driver examples that you can readily apply in the work environment.

Topics Include:

Char and network device classes

Kernel memory allocation and mapping

Bus-independent IO, DMA and remapping

PCI bus

USB bus

Linux unified device model

Concurrency and race conditions

Linux block IO layer

Debugging and profiling

Note(s): This is an advanced course, and the introductory lessons on device drivers will not be repeated in this course.

This course requires the purchase of a specific PCI or USB network board or adapter card (approximately $15 - 20, not included in the tuition) to complete the assignments. Students are expected to use their own Linux-based computers to do the programming project. The detailed board information will be provided in the first meeting of class.

Linux, Introduction

2.5 Units

This course introduces the Linux operating system. Linux is gaining popularity on personal computers, devices, embedded systems and enterprise servers. The course gives students an opportunity to use Linux for personal or professional purposes. Students will learn basic Linux administration, Linux file and directory structure, basic network configuration, shell programming

and various utilities available in Linux. The course provides students with a hands-on approach for learning Linux through assignments and projects. Topics include:

Open source software basics

Linux Desktops: KDE, Gnome

Using consoles (the command line)

Basic Linux commands like: ls, cat, rm, more/less, cp, mv, head/tail, and many more commands

Command history, Command pipes, redirection of standard input and output -- to combine commands together

Using "man"

Files, File compression: tar, gzip, bz2, zip, File Permissions

Find and grep basics

The bash shell, basic shell scripting

Monitoring and managing system resources: process basics, ps, disk usage, df, du

Installing software, package management and dependency tracking tools

Open source programs and utilities: Open Office, etc.

Basic Networking, physical/IP addressing, ifconfig, ping, DNS basics, basic DHCP

Interfacing with Windows: using Samba and NFS

Important startup and configuration files

Note(s): This course is the recommended prerequisite to the Certificate in Linux Programming and Administration. Students are encouraged to use their own personal computers with Debian for practice. Instructor will provide installation instruction on the first day of class. Options include VMWare, VirtualBox, LiveCD, disk partition or separate drive.

Linux Kernel Architecture and Programming

3.0 Units

The use of Linux is growing steadily in segments such as servers, embedded systems and mobile devices. As a result, the demand for programmers who can modify the open-source kernel for optimal performance of such products has also grown. This course provides in-depth knowledge of the latest 3.x kernel and enables you to understand the architecture and write kernel code to achieve the desired output. The course provides an introduction to kernel-level programming in Linux and writing kernel modules. Core kernel is covered at both the conceptual and practical/coding levels. The course starts with the kernel source code organization and how it functions. It covers topics in memory management, process creation and scheduling, interrupts, kernel synchronization, device drivers, and performance tuning. Discussion addresses various data structures and algorithms used in the Linux kernel. As part of the class work, students gain hands-on experience by changing the kernel statically as well as dynamically.

Note(s): To practice, students are expected to install or have access to Linux with Kernel 3.x (or higher) and GNU C Compiler on their home computers. Most flavors of Linux can work. Options include VMWare, VirtualBox, LiveCD, disk partition or separate drive.

Skills Needed: Proficient knowledge of Linux system programming and C programming language is required.

Linux Kernel Programming, Advanced

2.5 Units

Linux kernel programming is a challenging process that requires a thorough understanding of kernel, the system environment and CPU architecture. For Linux-based products that demand high performance or custom features from the kernel or modules, developers must work directly with kernel data structures, synchronization models, hardware models, process, memory and IO management at a much deeper level, and with little source code documentation. This course builds on the kernel knowledge and provides the next level details needed for real-world Linux product development. This course begins with a brief review of CPU (X86) architecture, basic system and kernel programming models, and socket programming. The discussion goes on to cover data structures and inter-workings of the kernel to build a deeper understanding of file system creation, process scheduling, memory management, and network stack management. Students learn the latest multicore, multi-thread management and inter-processor scheduling at the kernel and process level. The instructor will present practical examples of each topic throughout the course.

This course includes programming assignments for students to practice on their own computers. Either kernel version 2.6 or 3.x can be used in this course. Ubuntu distribution is preferred. Upon completion of the course, students will have advanced, expert-level kernel knowledge and experience.

Topics include:

Review and overview

File system creation and usage

Network stack management

Process scheduling and signaling

Single processor single-user process creation

Kernel process creation in the context of multi-tasking

Inter-processor (MPx) scheduling

Multi-threaded applications and kernel scheduling

Skills Needed: Proficiency in C programming and an understanding of networking basics is required.

Linux Programming and Administration Certificate Completion Fee

Once all of the certificate requirements have been met and your final grades are posted, please access your Student Portal to enroll in the “Certificate Completion Fee” to begin the review process. Please allow 4-6 weeks to receive your certificate.

Linux System and Network Administration

3.0 Units

This is a foundation course on building and maintaining a server for Linux professionals and system administrators. The focus is on basic network configuration, networking services security, remote access configuration and administration of Linux server. The course covers system logging, inter-networking and services security, which are designed to help administrators ensure that their systems are secure. Students perform basic administrative tasks such as adding and managing users, creating and maintaining file systems, imposing a security policy, maintaining shell and Perl scripts, installing and supporting network facilities such as NFS, DNS and DHCP. Instruction includes hands-on lab exercises. By the end of this course, participants will be able to administer and manage networked services on Linux-based platforms in a business environment.

To practice, students are encouraged to have Debian Linux installed on their computer systems. Instructor will provide download and installation instructions in the first class.

Skills Needed: A basic knowledge of Linux, networks, or comparable industry experience.

Linux System Performance in the Cloud and Data Center

3.0 Units

Linux is the dominant operating system in data centers and the cloud. Its robust networking and IO stacks can support high volume transaction processing. Linux has a rich set of resource management, monitoring and tracing capabilities. Well-tuned Linux systems can deliver low latency transactions and high throughput computing, even on commodity servers. This course introduces common methodologies for hosting workloads on Linux in the cloud and in data centers, including workload characterization, system profiling, performance management and benchmarking. The course is ideal for system administrators and solution integrators who want to learn the fundamentals of performance measurement, debugging and optimization methods used in these environments. The course begins with measurement and tuning concepts. It reviews how the components of Linux kernel (scheduler, network and IO stacks) and application API (with asynchronous and multi-threaded programming) interact and work together seamlessly as scalable solutions. You will learn how to identify resource contention issues resulting in lower throughput and higher latencies. You’ll also learn how to use the Linux resource management framework (Cgroups, containers) and server virtualization technologies to improve agility in resource provisioning. Additionally, you’ll gain experience simulating production workload for problem isolation and benchmarking.

You will gain hands on experience using the rich set of monitoring and tracing tools available in Linux, including pidstat, iotop, fio, and sysbench, as well as advanced tools to perform full software stack analysis such as systemtap, perf and sysdig. Students will also be exposed to the key cloud technologies such as data sharding, auto-scaling, Service Oriented Architecture (SOA) and the DevOps model, which allow companies to deploy cloud native services to provide new services at a scale not possible in the data center-based environment.

Topics Include:

Linux performance matrices, management and tuning principles

Linux kernel (scheduler, network and IO stacks)

Application API (with asynchronous and multi-threaded programming)

How to use Linux performance monitoring and tracing tools and interpret results

How to simulate production workload for problem isolation and benchmarking

Finding performance bottlenecks and application latencies via advanced tool sets

Industry trends: data sharding and auto-scaling in public and private cloud

NOTE: Students are required to bring their own laptops to do labs in class.

Linux Systems Programming

3.0 Units

System calls are functions called from within a C program, which provide access to the lowest level resources of the OS. Topics on Systems Programming covered in this class will enable a C programmer to understand and implement standard utilities (e.g. ls, wc, cat). It includes conceptual background, functional interfaces and topics on I/O control, file systems, access, and locking; signal handling; process and threads management; IPC using pipes and TCP/UDP sockets; and related discussions on makefiles, man pages and rpm packaging utilities. This course covers developing a complete ftp package, including client-side interface and the server-side components. The course materials include examples showing the use of all system calls introduced in the course, as well as complete client-server programs using TCP, UDP and RPC. This course is based on the POSIX standard, however, portability considerations for BSD extensions and SVR4 differences are discussed throughout.

Note(s): To practice, students are expected to install or have access to Linux Operating System version 7, or higher (version 9 is preferred) on their home computers. Options include VMWare, VirtualBox, LiveCD, disk paritition or separate drive.

Skills Needed: A basic knowledge of C language programming and a working knowledge of the Linux/UNIX operating environment are required.

Logistics and Transportation Management

3.0 Units

Logistics management is the art of getting materials from here to there. It includes transporting products through modes such as truck, rail, and air. This course will discuss the history of teach mode, including the oldest form of transportation, water. Government oversight and regulation of transportation will be covered, as well as the deregulation of transportation that occurred in the 1980s. What are the best methods of transport for local shipments? What about transport to other parts of the world? Each transportation mode has its own set of advantages and disadvantages, which will be covered in this course.

It is highly recommended that students take "Evolving Role of Supply Chain Manager" as the first course prior to taking this course.

Learning Objectives Identify the various modes of transportation and their advantages

Recognize international shipping terms used in the industry

Review key elements of transportation law and deregulation

Topics Covered History and evolution of logistics

Modes of transportation

Costs of transportation

Class and commodity rates

Transportation law and deregulation

Internal logistics and global supply chains

Leading technology and trends in logistics

Management and Organization, Principles

2.0 Units

PLEASE NOTE THIS COURSE IS SUSPENDED. YOU MAY SUBSTITUTE THE "APPLIED ORGANIZATIONAL BEHAVIOR AND COACHING" BUSM.X411 TOWARD YOUR BUSINESS ADMINISTRATION CERTIFICATE.

How can working professionals and managers improve their management effectiveness and, ultimately, their organization's performance? This course introduces valuable management tools, processes and techniques practiced by successful businesses. Through group discussions and individual and team exercises, this interactive approach enables participants to comprehend how managers orchestrate resources to successfully achieve the organization's mission. Within the framework of the essential management and organizational functions--strategy, structure, and behavior--topics include performance planning management and objective setting; communication and teamwork; systematic decision making, staffing, motivation and leadership; and organizational structure and control.

Note(s): Academic Course Number X435.1 BUSAD; HRCI--PHR, SPHR and GPHR strategic

recertification credit 19.5 hours.

Management of Clinical Practice

3.0 Units

In this course educational specialists delve into the business realities of establishing a successful independent educational therapy or a learning specialist practice. Students focus on best practices for one-on-one instruction to young students and adult learners with learning differences. Learn how the role of the educational therapist/specialist includes working as an investigator/support person and strategically communicating with a client's family, school, community, and culture. Additional course materials encourage students to dig deeper into the psychosocial aspect of learning differences and address topics of transference, counter transference, and termination.

This is an online course, and all assignments and lectures are hosted though Canvas. In addition to lectures, students master the content by:

analyzing case studies;

interviewing parents;

developing marketing collateral such as business cards, flyers, and essential information forms; and

writing by prompt for self-discovery.

Upon the conclusion of the course, students will be able to:

Articulate the role of an educational therapist/specialist

Assess the unique developmental needs of each client

Manage a caseload of multiple clients

Adhere to the ethical and professional standards of working with their clients

Develop a roadmap and toolkit for every stage of student instruction from intake through termination

Develop a personal outline/structure for their own clinical practice including details like marketing procedures, collaboration with other therapists, office procedures, record keeping, fee structure, time management, and work-life balance

Distinguish between the work of an educational therapist and other service providers

Establish appropriate partnerships/collaborations with other caregivers/service providers of each client

Managing Global Supply Chains

1.5 Units

The products that consumers use every day do not reach their local stores by accident. They are produced, assembled, and shipped from all over the world. Knowing how a product reaches its final destination is an important part of supply chain management. This class will cover trends in global supply chains, such as ocean transportation and overseas manufacturing (offshoring). How can we make the best sourcing decisions and how do we ensure supplier performance when they are in another country and time zone?

It is highly recommended that students take "Evolving Role of Supply Chain Manager" as the first course prior to taking this course.

Learning Objectives Recognize how global supply chains coordinate the flow of goods and services

Understand how supply chain decisions can impact global channel structures

Review commonly used international shipping terminology

Topics Covered Planning and sourcing in the supply chain

Strategy development and market research

Operations, delivery and inventory management

Global logistics management and trends

International trade agreements

Technology tools in global logistics

Outsourcing and offshoring

Make or buy decisions

Managing International Projects

1.5 Units

As businesses globalize, project managers must collaborate with team members from multiple countries. Surveys indicate that less than 40% of international projects succeed at meeting their

baseline business objectives. This course provides project managers with tools and techniques for developing international projects that succeed in the competitive multinational business environment You'll learn critical success factors for international projects, using objective metrics, as well as applicable resources and techniques and lessons learned. The course covers techniques for expanding projects into the international business arena and finding partners in emerging markets. Topics Include: Global business trends Characteristics of international projects Critical success factors for international projects International organizational options Intellectual property management Managing international contracts and agreements Effective communication management in a geographically fragmented project team Unique international project costs Finding international partners You'll be assessed on a practical problem-solving, exercise-based project. If your company is looking to extend its market reach, or if your start up is seeking a footprint in emerging market spaces, this is the course for you.

Note(s): Professional Credit: Project Management Institute -- PMP 15 Professional Development Units.

Managing Projects at Startup Companies

1.5 Units

Standard practices and techniques in the Project Management Body of Knowledge (PMBOK Guide), work very well at established companies, but are not always applicable to young companies or fast-track projects. In the turbulent environment of young companies, change occurs faster than in more mature companies. In this course, students learn how to adapt generally accepted project-management techniques to young companies where project timelines are compressed. Topics include:

Adapting planning, scheduling, tracking, and control techniques to accelerated projects

Leadership, politics, and the strategic aspects of project management

Key project-management processes; managing virtual and cross-functional teams

Web-based project management

This course shows managers and executives at young companies how to customize and use generally accepted project-management practices. In-class exercises and homework assignments lead students to results they can take back to work and immediately apply to their own projects.

Note(s): Professional Credit: Project Management Institute--PMP 15 Professional Development Units.

Managing Projects with Microsoft Project

1.5 Units

In fast-moving Silicon Valley companies, managing projects can be time-consuming and intense. Microsoft Project can make the process easier. This course presents practical guidance in the use of Microsoft Project to reduce the time spent on planning and increase the time available to manage

the project. The course is based on project-management processes, not on software features. Students learn how to effectively leverage the tool during all phases of project management, from requirements analysis, detailed planning, tracking/implementation, and close-out. Topics Include:

Pre-planning activities

Work breakdown structure

Defining tasks and resources

Resource leveling

Schedule optimization

Establishing buy-in

Tracking actual data

Valuable add-on tool

This course presents practical concepts and techniques for using a commonly available, but often-misused, management tool. No software programming experience is required.

Attendance for the first class meeting is required.

Note(s): Project Management Institute--PMP 15 Professional Development Units.

Managing Software Projects

1.5 Units

New and experienced project managers wanting to improve their management of software projects need to include key planning elements, appropriate techniques, effective communications, and ideas for self-improvement. In this interactive, two-day class, students explore the concepts and methods appropriate for managing creative, intangible product development. Included are the Agile, Critical Chain, and Critical Path methods.

Together we will identify the processes can prevent trouble on a project. Students are guided to those processes outlined by the Project Management Institute and the Software Engineering Institute. Instead of an exam, you respond to 25 targeted questions, producing a document that can guide you going forward.

The course is excellent for those seeking to improve their software project management skills for producing full scope, adequately tested, on time and on budget results. Note(s): Project Management Institute--PMP 15 Professional Development Units.

Managing Technical Documentation Projects

1.0 Units

This course equips technical communicators with the knowledge, tools, and techniques necessary to develop: Information and project plans; Reasonable, accurate, and detailed documentation project budgets; Schedules to meet due dates and control costs. In addition, students learn how to track and close out projects. While most of the course focuses on traditional information project plans, the last segment will introduce you to managing documentation projects in Agile environments. Topics include:

Applying project management fundamentals to technical communication projects

Creating industry standard information and project plans

Monitoring and controlling projects effectively

Closing projects to benefit future projects

Exploring tools related to managing technical communications projects

Students need to bring a calculator and pencil to class.

For Online Sections of this course: Online courses are largely self-study with instructor support through threaded discussion groups, email and sometimes scheduled online chats. Some instructors may allow students to pace themselves following the published syllabus, enabling them to accelerate through the material and finish early. However, all students must complete and submit all assignments by the schedule end date. Grades are issued for the entire class approximately two weeks after the scheduled end date.

Managing the Development of New Products

1.5 Units

On average, high-tech projects are late most of the time despite the use of modern-day tools. Learn the winning formula of best practices that project managers are using worldwide to get results in half the time and at half the cost. This course addresses the root problems and demonstrates proven techniques to create product visions, build effective teams, make wise cost-benefit-risk tradeoffs, and learn the step-by-step development flow in order to achieve fast time to market. This course shows you how to put common sense into practice and get outstanding results in industries such as hardware, software, IT, Web systems, services, medical, biotech, and more. Topics include:

Product vision process

New product-development flow methodologies

Teamwork and leadership on rapid projects

Quality function deployment and the customers

The course is appropriate for project leaders, team members, engineering and marketing managers, directors and vice presidents.

Note(s): Project Management Institute--PMP 15 Professional Development Units.

Managing the Staffing Function

1.5 Units

Recruiting top talent for an organization is one of the most difficult challenges for staffing departments today. Those responsible for staffing are under immense pressure to obtain the talent necessary for organizations to meet business goals. This workshop explores critical issues related to managing the staffing function. Course exercises reinforce student understanding and student projects provide an opportunity to demonstrate the knowledge acquired. Topics Include:

Understanding staffing models

Workforce planning

Budgeting and managing staffing costs

Marketing the staffing function

Developing effective hiring processes

Selecting and evaluating resources

Maximizing the recruiting website

College recruitment and employee referral programs

Managing global requirements

Measuring performance

Note(s): HRCI--PHR, SPHR and GPHR general recertification credit, 16.5 hours.

Marketing Management Certificate Completion Fee

Once all of the certificate requirements have been met and your final grades are posted, please access your Student Portal to enroll in the “Certificate Completion Fee” to begin the review process. Please allow 4-6 weeks to receive your certificate.

Marketing Operations 2.0: Tactical Discipline to Strategic Vision

2.0 Units

Marketing operations is a quickly growing business role that integrates marketing technologies, drives sales and marketing alignment, and generates value through analytics and demand generation. You've learned about it in many courses that are focused on customer relationship management, database marketing, customer acquisition, digital marketing, and analytics. The expanded role has been instrumental in increasing the chief marketing officers' historically short tenure—of 26 months in 2012 to 43 months today. Still, however, many marketing leaders continue to take a short-term and tactical orientation that has limited their scope and influence in many organizations. The inability of marketing to demonstrate its long-term value inevitably leads to slashed budgets and headcounts.

Marketing Operations 2.0 focuses on best-in-class marketing operations teams that drive marketing performance by instilling accountability, alignment, and organizational agility skills across all marketing functions. It elevates marketing's contributions to the CEO's objectives. Learn to connect the dots across the marketing ecosystem, optimize and expand resources and talent, facilitate organizational learning and change management, ensure customer-centricity, minimize chaos to maximize scalability, model the future, monitor value, and champion strategic opportunities.

Topics include:

Connecting the dots between marketing strategy, guidance, processes, metrics, technology, and ecosystem Identifying appropriate Lean/Agile techniques to increase marketing's effectiveness and efficiency Guiding marketing resource management decisions in budgeting, technology optimization, talent development Assessing and directing marketing's alignment across its internal and external stakeholders Elevating the C-team's positioning of marketing from a cost center to a strategic impact center of excellence

Mastering Data Structures and Algorithms: A Practical Approach

3.0 Units

Prepare yourself to answer the data structure and algorithm questions that often come up in Silicon Valley job interviews. In this course, students will get the extensive practice they need to master data structures and algorithms— the foundation of good software engineering. Students will use high-level languages like Python, C, C++, or Java to learn a practical approach to solving data structure and algorithm. The course starts with a review of time and space complexity. Analysis of algorithms and basic math is involved. We review basic data structures such as arrays, strings, linked lists, stacks, queues, and priority queues, and progress to more complex tasks involving hashes, trees and graphs. Students learn through working on a relevant problem for each section that helps them understand such data structures. They review basic algorithms and problem-solving techniques: including recursion, dynamic programming, divide and conquer, sorting and searching, and some graph algorithms. Testing is emphasized as a critical part of solution building.

Students who successfully complete this course will be well-prepared to answer questions and solve problems related to data structures and algorithms in their next job interviews.

Students must program their solutions in Python, C, C++, or Java.

Topics Include:

Computational and space complexity estimation: Big O notation.

Data structures:

* Bit manipulation

* Arrays and Strings

* Linked lists

* Stacks and queues

* Priority queues

* Hashing

* Trees and graphs

Algorithms

* Sorting

* Searching

Algorithm design techniques

* Recursion

* Greedy algorithms

* Divide and conquer

* Dynamic programming

* Backtracking

Prerequisite(s): C, Java, Python or C++ as taught in the following courses: Python for Programmers, C++ Programming Comprehensive, C Programming Advanced , or Java Programming Comprehensive.

Math Development in Young Children

2.0 Units

This course focuses on teaching math to young children and covers California math standards for early childhood. You'll participate in hands-on activities and create exciting math games for young children. The course also addresses how young children recognize patterns in nature and how you can connect math to art. With ample instructor modeling, you'll practice ways to create unforgettable moments of discovery, enchantment, and magic by studying geometric patterns and numbers. This course is recommended for teachers, parents, and caregivers of preschoolers and kindergartners. A strong background in mathematics is not required.

Topics Include: Curriculum principles for early childhood mathematics

Mathematical learning for children ages 3 through 8

Mathematical processes in early childhood curriculum

Promoting development of key skills and concepts through math play

By the end of the course, you'll be able to: Describe some activities that lead children to become more engaged in mathematics

Understand the importance of planning math curriculum for children

Explain strategies that help children who find math challenging

Identify assessments that can be used to see if children understand new math concepts

Medical / Clinical Terminology

0.7 CEU's

A basic understanding of medical and clinical terminology is essential in clinical trials design and management. This interactive workshop, for individuals with no background in medical/clinical terminology or for those who would like a refresher, reviews common terms associated with medical research and development and clinical trials. Participants review both the meaning of each term and how it is applied within a practical context. This workshop is a prerequisite for the Clinical Trials Design and Management Certificate program.

(2928)

Medical Devices Certificate Completion Fee

Once all of the certificate requirements have been met and your final grades are posted, please access your Student Portal to enroll in the “Certificate Completion Fee” to begin the review process. Please allow 4-6 weeks to receive your certificate.

Medical Devices: Regulatory Strategies and Marketing Pathways

1.5 Units

Medical devices are different from drugs and biologics in their regulation and paths to market. Effective clinical trials design and management for devices requires a solid understanding of these issues. This course defines medical devices and explains routes to market, regulatory pathways, successful investigational device exemption (IDE) and PMA submissions to the FDA. You'll also learn how to get devices effectively to market, manage and report adverse device events (MDRs)

and other post-market FDA surveillance tools and get a glimpse into the future of device regulations. Topics include:

The FDA’s role in the American medical device industry

Risk-based classification of devices

Regulatory pathways for medical devices

Uses of clinical data and clinical studies including the IDE program

522s, medical device reports (MDRs), and recalls

Note(s): Students pursuing the Clinical Trials Certificate who are also interested in the Regulatory Affairs Certificate may take "Regulation of Medical Devices and Diagnostics" to fulfill the "Medical Devices: Regulatory Strategies and Marketing Pathways" requirement in the Clinical Trials Program. You can use the extra 1.5 units towards meeting the elective requirement for the Clinical Trials Design and Management Certificate program.

Professional Credit: CA BRN/LVN Credit - Provider #CEP13114.

Medical Device Verification and Validation

1.5 Units

Verification and validation is the process of determining whether a medical device and its manufacturing process meets design input requirements and ensures that devices conform to defined user needs and intended uses. It answers the questions, "Are you building the right safe and effective device?" and "Are you building it right?" One of the most common reasons that ISO auditors and the FDA issue warning letters is because they notice an inadequate verification and validation—or a complete lack thereof. Successful validations satisfy compliance and regulatory requirements, and they also provide for robust manufacturing processes. The result is increased operational efficiency and reduced costs within an organization. This course reviews regulatory terminology of verification and validation and explores tools that can be used to set-up and implement a robust and cost-effective medical device product and manufacturing process verification and validation program. Topics include:

Site validation master plan requirements

Validation of computer systems, facilities, utilities, laboratory instrumentation and manufacturing processes

Principles of effective medical device product and manufacturing process verification and validation

Writing effective verification and validation plans, protocols and final reports

Writing Effective Clinical Trial Plan, Protocol and Report

This course will benefit medical device professionals who are responsible for project planning, marketing, design and development, technology transfer, operations, manufacturing, quality assurance, regulatory affairs and customer service and support.

Skills needed: Knowledge of regulatory compliance for medical devices will be helpful.

Medical Writing

2.0 Units

All biopharmaceutical companies must produce scientific reports and summary documents for regulatory agencies. Good documentation should be not only scientifically sound, but also clear, effective and concise. This course provides the practical skills needed to write effective documents for the healthcare industry. You'll gain practice through hands-on exercises and group projects based on documentation used in pharmaceutical development. Topics include:

The essentials of good writing required for any profession, including the proper use of grammar and punctuation

Copyright, permission, and ethics

Working with journal editors and regulatory reviewers

Writing letters to the editor, scientific review articles, clinical study protocols, clinical study reports, and press releases

Preparing scientific posters

Drafting documents that are user-friendly and comply with regulations

Creating clear and concise content

By the end of the course, you should be able to demonstrate the basics of effective writing and streamline the writing process from raw ideas to finished documents.

Professional Credit: CA BRN/LVN Credit--Provider #CEP13114.

Methodology of Bilingual and English Language Development

4.0 Units

What are the most effective methods for teaching bilingual English language development? New methods, in tandem with traditional methods, have triggered a surge in effective language teaching and learning. In this content-rich course, you'll review both the theory and practical methods needed to deliver bilingual education and teach English language development. Topics include program design, instructional strategies, current methods and approaches, such as submersion, two-way bilingual programs, total physical response, and literacy development. You'll gain hands-on experience applying selected methods and approaches and will present a mini-lesson to get constructive feedback from your peers and instructor. **Topics Include:** Audio-lingual method

Total physical response

Natural approach

Communicative language teaching

Community language learning

Participatory approach

Silent way

Accelerated learning (Suggestopedia)

Microeconomics, Introduction

4.0 Units

PLEASE NOTE THIS COURSE IS SUSPENDED. YOU MAY SUBSTITUTE THE "BUSINESS ECONOMICS" (2 UNITS) BUSM.X401. YOU WILL NEED TO TAKE AN ADDITIONAL 2 UNITS TO MAKE UP THE REMAINING UNIT REQUIREMENT FOR THE BUSINESS ADMINISTRATION CERTIFICATE.

This course is an introduction to basic economics, analysis of prices and markets, consumer behavior, the theory of production and costs, pricing and employment of the factors of production, international trade issues, public policy and current domestic microeconomics problems.

Note(s): Academic Course Number X414 ECON; HRCI--PHR, SPHR and GPHR strategic recertification credit, 37.5 hours.

Minimalist Design for Documentation

0.5 Units

The minimalist design model holds that computer users learn more efficiently and use products more successfully by working more with the system and less with the documentation. Developed by Dr. John Carroll, the minimalist model is the subject of many recent papers in the fields of human factors and documentation. The principles of minimalist design can be applied to complex technical documentation as well as to introductory training materials. Minimalist design focuses on: Slashing the verbiage by omitting expository text

Creating modules or chunks that can be used in any order

Expecting user errors and providing recovery tips

Concentrating on the user's own tasks, professional communicators attending this workshop

analyze how to shorten documentation and training materials while increasing their effectiveness. Recent research on minimalism and techniques for applying minimalist design to online documentation and Help systems are presented.

Mobile Application Development - Android and iOS, Advanced

3.0 Units

In this course students move from the introductory concepts of our first Mobile Application Development course to a more comprehensive coverage of popular concepts and architectural topics required for developing successful, high quality mobile applications. Students will enhance their understanding and skills using a more advanced technology stack including background operations, web operations, and image handling. You will also practice interactions with operating system features—audio, video, camera, telephony, maps, location services, notifications, advanced GUI layouts, and navigation bars. This course also covers performance and memory management recommendations. Through coursework and classroom exercises of increasing depth, students will create a fully functional mobile application involving multiple advanced features and cloud back-end. To truly complete the picture, you will explore the basics of cloud-based backend infrastructure and its integration with mobile applications. Using the Firebase cloud platform from Google, we will focus on essential topics such as user authentication, data synchronization across multiple mobile devices, analytics, and continuous application monitoring. This course also covers fundamentals of cyber security techniques for both Android and iOS mobile platforms, an extremely valuable skill set for any professional developer.

Topics include:

Background operations

Navigation and notifications

Web and connectivity

Common operating system functionalities

Maps and location services

Backend cloud services

Cyber security fundamentals

Memory management and performance

Skills needed: Familiarity with at least one higher-level language such C++, Java, C#, Python, or PHP and Introduction to Mobile Application Development.

Mobile Application Development - Android and iOS, Introduction

3.0 Units

In this comprehensive overview course, both beginning and experienced students learn mobile application development for Android and iOS while exploring Flutter, Google's latest cross-platform development framework; and the Kotlin and Swift programming languages. Through coursework and classroom exercises of increasing depth, students will create a fully functional mobile application.

You will get exposure to the latest technologies while learning the fundamental building blocks of application development, such as understanding architecture, life-cycles, GUI, and MVC design pattern. Developing a basic Android and iOS application during the class gives you valuable hands-on experience. A combination of theory and practical programming experience will best prepare you for your career.

This course also benefits individuals in management or on developer teams who want to efficiently execute on mobile application projects. At the end of the course, students will understand the fundamentals of building a cutting-edge mobile application on Android and iOS and how to publish it as well.

Topics include:

Development environment setup

Android architecture

iOS architecture

Flutter framework

Hello mobile app

GUI development

Swift and Kotlin overview

Persistent data storage

Tips and tricks

Publishing on Google Play

Publishing on App Store

Overview of advanced topics

Prerequisite:

Familiarity with at least one higher level language, such as C++, Java, C#, Python, or PHP

Mobile Application Development Award Completion Fee

Once all the Award requirements have been met and your final grades are posted, enroll in the "Award Completion Fee" to begin the review process. Please allow 4-6 weeks to receive your Award.

Mobile e-Commerce, Fintech and Cryptocurrency

3.0 Units

Explosive growth in mobile e-commerce is paving the way for new, intuitive, and disruptive technologies to reshape the fintech industry creating exciting opportunities for entrepreneurs, marketers, programmers, and engineers. AI, data analytics, and deep machine learning are driving innovations that map the consumer journey in the store, on the web, and in an app for a ubiquitous and unified shopping experience. In this introductory course, students with a business background or programming experience will have an opportunity to develop an in-depth understanding of the transaction process. We will explore the consumer journey—from merchants to acquirer, and from processor to brands and banks—getting a better understanding of how major traditional and online companies are investing in the development of e-commerce. You'll also learn how check-out free stores like Amazon Go are utilizing sensor fusion, computer vision and smart IoT solutions to reduce friction and increase consumer convenience.

Starting from magstripe to secure chip-card and mobile wallets such as Apple Pay and Google Pay, this course covers advancements in e-commerce, security, payments, blockchains, and artificial intelligence. You will learn details of alternate payment methods such as AliPay and Wechat Pay and how to use methods such as Amazon Pay, PayPal, Visa checkout, and Stripe for online commerce. A new module will provide introduction to voice-based commerce using Alexa Skills. We will dive into the role of data analytics, AI and deep machine learning for fintech, security and risk management, concluding the course with a focus on blockchains, crypto-currencies, and emerging trends. Depending on your experience and background, you will either produce a case study or build an e-commerce project in an iOS or Android environment.

By the end of the course, you will understand the fundamentals of e-commerce, mobile payments, security, AI in fintech and intelligent data analytics to offer a seamless commerce experience. You will be better prepared to engage in developing innovative platforms and applications and pursue new market opportunities.

Topics include:

Fundamentals of international commerce/e-commerce

Traditional magnetic strip and secure chip-based EMV payment systems

the transaction process

Security

Mobile wallets: Apple Pay, Google Pay

Alternate payments: AliPay, WeChat Pay

User experience and consumer journey

NFC, SE, BLE, QR codes

Voice-enabled e-commerce

Multi-factor authentication

AI, data analytics and DML in fintech

Risk management

Standards, certification, and compliance requirements

Blockchain applications, cryptocurrencies

Future trends

Skills Needed: General understanding of e-commerce and some programming experience.

Mobile Interface Design

3.0 Units

There are hundreds of thousands of mobile apps in the App Store, but only a small portion of them have innovative design principles, friendly user interfaces, and most importantly, widespread adoption by users. In this hands-on lab and lecture course, you will learn the core principles for creating effective user interfaces for mobile devices incorporating iOS 12/13, Android Material Design, responsive/parallax design, lean mobile UX, form factors, GPS, gestures, tactile experiences, sensors, commerce, tagging and more. You will discover useful patterns for developing mobile products and design a mobile user experience using an iterative and user-centered design process. The school provides short-term licenses of commercial prototyping tools (Balsamiq Mockups and Fluid UI) for sketching wireframe and mobile prototyping. Designing your own prototype will provide opportunities to explore new types of touch- and gesture-based user interaction that can expand the functional possibilities of your apps. This exercise will demonstrate how mobile products can be rapidly developed and released to the market.

The course covers the trends, industry practices and techniques for the most popular platforms, and by the end of the course, you will have created an engaging user interface prototype for a mobile application or the web. This mobile UI prototype will incorporate the new conceptual and technical skills learned, and can also function as a portfolio piece for future endeavors.

Topics include:

iOS 12/13 and Android Material Design Human Interface Guidelines

Responsive Design/Parallax UX Design

iOS 12/13 and Android UI patterns

Cryptocurrency & Blockchain UX

Lean Mobile UX

Windows mobile UX/UI design

Mobile design strategy

Mobile platforms and technology

Meaningful mobile experiences

Form factor user interface

Low fidelity mobile concepts

Mobile prototyping software

Prototyping methods

Mobile storytelling workflow

Gesture experiences

High fidelity mobile prototyping

Designing for the developing world

Tactile interfaces

Mobile tagging

Methods to pitch your product to VC

Design portfolio showcasing your app

Skills needed: Familiarity with a drawing tool is recommended for the exercises (e.g. Adobe Illustrator, Photoshop, or Sketch) but not required.

Mobile Medical Applications

0.5 Units

A growing number of health-related software applications are being developed for use on mobile platforms, including smartphones and tablet computers. These applications are creating new and innovative ways for technology to improve health and health care. Consumers are using mobile medical applications to manage their own health and wellness and health care professionals are using applications to improve and facilitate patient care.

Developers of mobile medical apps and other medical devices professionals may be unsure about how or if FDA regulations apply to their products.

This course begins with an examination of the mobile platforms and existing mobile medical applications and the applicability of mobile medical applications as medical devices. The course then covers current FDA requirements for mobile medical applications and regulatory approaches to ensure the development of compliant, safe, effective and profitable mobile medical apps.

This course will benefit professionals from the medical device sector who are responsible for project planning, marketing, design and development, technology transfer, operations, manufacturing, quality assurance, regulatory affairs and customer service and support for mobile medical apps.

Mobile UA

Smartphones have spurred the rapid emergence of a huge new software segment: the mobile application. This new field and its virtually limitless implementations present important questions for user assistance professionals: What is the future role of UA in mobile app development and support, and how can one prepare for success in that role? As the mobile app market continues to soar, this is becoming the next frontier for user assistance professionals. Upon completing this course, you will understand the mobile platform and its unique technical and design considerations. You will be ready to plan mobile UA, design and write UA for mobile apps, and understand the tools necessary to develop and deliver UA for mobile apps.

Molecular Diagnostics

1.5 Units

Rapid advancements in molecular diagnostics are drawing the attention of the bioscience industry, regulatory agencies, clinicians, patients and insurers alike. This survey course provides a foundation in the basic science and technologies that underlie the emerging field of molecular diagnostics, and highlights potential impacts on the healthcare landscape. Interactive lectures explore the intricate relationship between the human genome and diagnostic tests. The instructor addresses the growing importance of personalized medicine, and touches upon the role of pharmacogenomics in the development of new therapeutics and treatment options. She uses case studies to present the applications of molecular diagnostic tools in infectious disease identification and early detection and diagnosis of cancer. Professional Credit: CA BRN/LVN Credit--Provider #CEP13114.

MySQL and Oracle Database for Developers and Designers

2.0 Units

Oracle and MySQL are both reliable database engines commonly used for storing and serving data as web content. They are popular among developers of open source platforms and projects on the Web. High volume major websites use them. They also have a significant user base in the enterprise database market. This course is intended for DB developers and designers who want to learn MySQL and Oracle technology in depth. The course begins by reviewing the basic SQL queries, DDL and DML operations, data retrieval from multiple tables, and different types of storage engines in databases. It then introduces the aggregate, the index merge, data manipulation, and stored procedures in MySQL. You will learn to write complex queries and get hands-on experience with advanced features such as creating sub programs, data security, triggers, and dynamic SQL. You will also learn a performance tuning strategy, server configuration, loading techniques and the application architecture for efficient database design. This is a hands-on lab-based course designed to help students master MySQL features and tune for performance. Topics include:

Review of MYSQL and Oracle database essentials

Understanding MYSQL storage engines, transactions and features of the database and how it differs from Oracle

Performing DDL and DML operations using SQL commands

Retrieving data from multiple tables using JOINS

Writing complex queries using JOINS, SUBQUERIES and nested SUB QURIES

MYSQL functions including single-row, multiple-row, group and aggregate functions

Understanding Oracle and MYSQL optimizer and index merge method

Developing and managing database stored procedures including best practices

Exception handling and error handling capabilities in both Oracle and MYSQL

Utilizing database triggers to automate database operations

Oracle and MYSQL performance enhancements with queries and indexes

Database loading techniques and their effects on performance

Skills Needed: Students should have prior knowledge of the installation and basic operation of MySQL.

NoSQL Databases, Introduction

3.0 Units

NoSQL databases support Big Data by providing scalability, high-availability, clustering, efficient storage and easy access to huge amounts of “semi-structured” data. NoSQL databases use schema-optional (non-relational) formats and are, in general, open-source. This course gives you a hands-on overview of the two most popular NoSQL databases - MongoDB and Cassandra – as well as an overview of core concepts and other types of NoSQL databases. The course covers installation, DB shell usage, programmatic access, data modeling, scaling/clustering, categories of NoSQL databases (column-based, document-based, key value-based, or graphic-based), the CAP Theorem, and BASE semantics. You will have the opportunity to gain hands-on experience via homework asignments and a course project that involves setting up, populating (with publically available datasets), and using a NoSQL of your choice (subject to instructor approval). By the end of the course, you will understand NoSQL concepts and know how to use popular NoSQL databases within your software or IT infrastructures.

Topics Include:

Why use NoSQL databases?

Types of NoSQL databases: Key value, document, column, graph, others

MongoDB basics

MongoDB data modeling, GeoData

MongoDB sharding, replication, clustering

Cassandra basics

Cassandra data modeling, real-time data with wide rows

Cassandra rings, replication

Other NoSQL databases: Neo4J, DynamoDB

Accessing NoSQL database APIs: Coding

Deploying NoSQL databases in the cloud: Amazon AWS

Using publically available datasets

CAP theorem, BASE

Skills Needed: Experience using a programming language such as Python, Ruby, Java, etc. Ability to set up open-source software, databases, tools, and development environments on personal computers.

Object-Oriented Analysis and Design

3.0 Units

Object-oriented design involves transforming the descriptive analysis models into computational models for coding. During an object-oriented requirements analysis, a descriptive model of the problem domain is developed into system specifications. This course is intended for software engineers and managers who will be involved in the design of an object-oriented system. The course focuses on case studies and carries them through the design phase. Instruction uses the notation specified by the Unified Modeling Language (UML) developed by Booch, Jacobson and Rumbaugh. Students will learn Agile and Iterative Development methodologies, such as Unified Process and SCRUM, and use case design and requirements driven design, among other important topics. The course covers the principles of object-oriented design as well as practical considerations for applying these principles. The course includes a comprehensive final project for students to practice requirements gathering and documenting design using different UML diagrams. Upon successful completion of this course, students should have an understanding of the principles of object-oriented design and system modeling and experience in applying these principles to real-world projects.

Skills Needed: Programming experience required in an object oriented language. e.g. Java, C++, C#, Python, etc.

Object-Oriented Development: Architecture and Design Patterns, Advanced

3.0 Units

This course will equip you with an arsenal of software design and architecture skills. The goal of object-oriented design is to produce design models of a software system. A design model describes a system’s internal structure and behavior from the developers' point of view and guides them during system implementation. The design model is derived by an iterative process—components, sub-components, etc.—from the analysis model, which describes the system from the user's perspective. Design and analysis models are constructed out of Unified Modeling Language (UML) diagrams and recurring design templates called design patterns. After presenting an overview of how object-oriented design fits into the software development process, the course focuses on

assembling systems from components using architectural patterns such as Model-View-Controller, Component-Container, Client-Server, and Agent-Based. You'll also learn about the internal structure and dynamics of components using class diagrams, sequence diagrams, and design patterns. Assignments will focus on using CASE tools to build design models. Programming assignments will include analyzing designs and building frameworks.

Skills Needed: Knowledge of object-oriented development, including UML notation, and familiarity with an object-oriented language such as Java or C++.

Note: Students should bring a laptop with StarUML 2.0 and either Eclipse or NetBeans installed.

Organizational Development and Change, Introduction

2.0 Units

Students in this course study the planned, systemic change interventions that increase effectiveness and enhance individual development. In addition to gaining exposure to evidence-based models for effective organizations, students practice the art of navigating through ambiguity. They learn to work with different personality types. In this experiential, interactive course, students engage in group activities and collaborate on a team project, both in and out of the class.

Designed for leaders who are charged with bringing about change, this course builds a valuable foundation for managers, human resource professionals, internal and external consultants, and those interested in pursuing a career in this field. It provides an overview of the field of OD, the nature of change, and the role of the OD practitioner.

Topics Include:

The 21st century organization

Organizational structure, design, culture, systems and rewards

Management and leadership

Diagnostic models and systematic change intervention

Note(s): Professional Credit: HRCI---PHR, SPHR and GPHR general recertification credit: 19.25 hours.

Outsourcing and Contract Management

1.5 Units

Securing the best outside people to get things done requires strategic planning, project bidding, negotiation, and subcontractor management. In this course you learn everything you need to know to successfully manage outsource procurements as self-contained projects. Find out how to efficiently plan your next outsourcing project, organize procurement management teams, and

prepare clear request-for-proposals. You'll also gain valuable insights for successfully managing subcontractors and containing costs in a contract period. Topics Include:

The reason behind the growing demand for outsourcing

Effective procurement management planning

Organizing procurement management teams (PMTs)

Developing procurement requests-for-proposals (RFPs)

How to write an effective statements of work

Understanding contract types and incentives

Evaluating bidder proposals

How to select the best bidder

Negotiation strategies and techniques

Monitoring and controlling subcontractors

Analyzing subcontractor performance

Managing subcontractors when things go wrong

Terminating subcontracts

Students enjoy a varied and interactive curriculum of textbook readings, supplemental online procurement articles, engaging threaded discussions, bid selection practice, and detailed instructor materials that complement textbook reading assignments.

Note(s): Project Management Institute--PMP 15 Professional Development Units.

Paralegal Core Certificate Course©

9.0 CEU's

The nationally acclaimed core paralegal curriculum is a 14-week intensive program designed for beginning and advanced legal workers, such as legal secretaries, file clerks, and paralegals without formal paralegal training. While not a University of California, Santa Cruz-designated certificate program, the Paralegal Core Certificate Course© taught through the Center for Legal Studies (CLS) meets state of California paralegal certification requirements, and culminates in a certificate of completion. The instruction is practice-oriented and focuses on high-demand paralegal skills. Curriculum includes: Legal terminology, documentation, ethics, and the litigation process;

The evidentiary predicate—an introduction to the rules of evidence and civil procedure;

Identification of relevant authority;

Legal research techniques for use in legal memoranda, motions, and briefs;

Shepardizing® statutes, case law, the West Key Number System®, and the use of computerized

legal research terminal; and

Legal writing and appellate procedure, emphasizing preparation and critique of legal memoranda, the interoffice memorandum of law and an appellate brief.

Student research assignments are thoroughly discussed and critiqued.

Course Structure

The subject material for this course is provided in two seven-week modules: Paralegal I and Paralegal II. Your course fee includes both sessions. At the conclusion of Paralegal I, you will be asked to enroll in Paralegal II. Registration for Paralegal II is handled through CLS, not through UCSC Extension.

Course Materials

For Paralegal II, you are required to purchase Westlaw® access directly from CLS. CLS will send student logon information on the first day of class.

Learn more about curriculum details and purchase required text books and Westlaw access at www.legalstudies.com , or by contacting CLS at (800) 522-7737 or info@legalstudies.com .

Refund Policy

Students in the Center for Legal Studies program are accountable to the UCSC Extension refund policy and associated fees. Learn more by visiting the UCSC Extension policy section on our website ucsc-extension.edu .

People Analytics–Delivering Measurable Business Impact

1.5 Units

In People Analytics , students learn the power of using data to drive measurable business outcomes and design data-driven people strategies to catalyze change and transformation in the workforce. You will see how to find and use data, win support for your new people analytics program, diagnose missteps, predict success, and prescribe change based on data rather than intuition. With data as our foundation, we will discuss the four stages of analytics and common pitfalls of people analytics programs. Learn to motivate and inspire leaders to integrate data and analytics with their personal expertise, thus enabling a more effective use of an organization’s most precious resources: people’s time and energy.

Personal Financial Planning Certificate Completion Fee

Once all of the certificate requirements have been met and your final grades are posted, please access your Student Portal to enroll in the “Certificate Completion Fee” to begin the review process. Please allow 4-6 weeks to receive your certificate.

Personal Financial Planning, Practicum

4.5 Units

This final course in the certificate program is open only to students who have completed all other required courses. You'll apply the skills and knowledge gained in prior courses through the extensive use of case studies, then undertake the process of preparing and presenting a complete financial plan in an environment of non-liability. You'll be exposed to the practical business and professional aspects of conducting a financial counseling practice, including ethics, and CFP® standards of practice.

Contact the department for approval before enrolling in the class by emailing extensionprogram@ucsc.edu.

Personal Financial Planning, Survey

4.0 Units

This course introduces the professional and technical content of personal financial planning. It emphasizes the identification and quantification of financial objectives and the interrelated facets of a wide range of technical material. Topics include data gathering, income taxation, investment analysis and procedure, insurance, employment benefit plans, debt management, estate planning and cash-flow management. This course also covers the ethics, strategies and processes of professional practice and CFP® standards of practice. Included in the course work is an introduction to some basic concepts of economics.

Note(s): An HP-12C or equivalent financial calculator is required.

Physical Design Flow From Netlist to GDSII

3.0 Units

With shrinking process technologies, physical design is becoming extremely challenging. Physical designers are responsible for producing high quality design tapeout, and an understanding of all aspects of physical design from synthesis to tapeout is critical to success. This course is an introduction to the ASIC physical design flow and tools from netlist (gate level) to GDS-II (fractured data). After an overview of the ASIC physical design flow and synthesis, the course starts with floor planning and block pin assignment. It then covers placement and clock-tree synthesis, followed by routing, and post-route optimization. You will learn RC extraction, static timing analysis, and physical verification. Upon completion of this course, you will possess the essential knowledge and hands-on experience with the backend physical design flows, from a synthesized netlist all the way to layout completion for ASIC chip tapeout.

In the lab, the instructor will explain the tools used primarily for the placement and route part using IC Compiler (ICC). Other tools will be integrated within the flow but are available for students to practice on their own.

Topics include:

Physical design flow and synthesis

Floorplanning and pin assignment

Placement and clock-tree synthesis

Routing and optimization

Wire and extraction

Timing

Physical verification

Tapeout

Skills Needed: Basic knowledge of backend design flow. Hands-on experience with Linux/Unix will be required for lab exercises.

PMP® Examination Preparation: 35 Hour

3.5 Units

This course is a comprehensive 35-hour PMP® exam prep class offering an in-depth review of the exam content. It covers each topic in the current version of PMI®'s source document for the exam: A Guide to the Project Management Body of Knowledge, Sixth Edition, Project Management Institute, Inc., 2017. The course also covers relevant topics that are not included in the PMBOK that PMP applicants are expected to know. You will learn project management concepts, processes and applications. You will practice with PMP exam questions, as well as exercises that explore broader project management concepts. By the end of the course, you will receive a simulated 200-question exam in the style of the PMP® exam to get a feel for what it takes to sit for the four-hour exam. Upon completion of the course, you will earn the 35 professional development units (PDUs) necessary to sit for the PMP exam. Extension students have had impressive success rates in passing the PMP exam after completing this comprehensive 35-hour course.

Positioning and Brand Management

1.5 Units

Dynamic market positioning is a strategic process designed to build awareness of companies and their products. Through lecture, case-histories, and discussion, this course examines the step-by-step process used to position high-technology companies and their products. This course is designed for marketing-communication and product-marketing managers who are planning to launch new products or need to reposition existing products, and is of equal benefit to business owners and CEOs of small companies who want to understand how to leverage their marketing dollars by establishing powerful brands and positions in the market. Topics include:

Assessing and analyzing markets based on benefit and feature sets

Evaluating existing positions and windows of opportunity

Understanding and developing brand values, touch points and personas

Mapping competitors in the market

Creating positioning statements

Establishing brand management throughout a company

Devising methods to preserve and enhance the brand

Post-Market Regulatory Obligations for Medical Devices

1.5 Units

Once medical devices are on the market, manufacturers are required to follow specific requirements and regulations. This includes investigating complaints, submitting to the FDA's eMDR system for reporting device malfunctions, injuries or deaths; handling recalls, managing post-market surveillance studies requirements under section 522 of the Federal Food, Drug and Cosmetic Act, as well as post-approval studies required at the time of approval of a premarket approval (PMA); and handling advertising and promotional labeling. This course offers the opportunity to apply these post-market regulatory requirements via in-class activities using case studies.

Power of Market Research

2.0 Units

Executives need market research to make informed strategic business decisions on product planning, target markets, customer requirements, communications strategies, pricing, distribution channels and many other factors. From high tech case studies where the feature set of a product and its competitors is the most important thing to research, to high volume internet and consumer businesses where user trends need to be statistically analyzed and forecasted, this course will show the market power you can gain from key knowledge points. Topics range from basic survey techniques in both primary and secondary research to an understanding of the power of statistical fact-gathering and analysis including:

Sources of secondary research Primary research process and costs Developing a survey for in-person and online usage Translating, assessing and defining market trends Customer profiling and typical product persona development Competitive market segment and customer analysis Integrating results into business planning

Through lectures, projects, reading, analysis of case studies and class discussions, you will learn to identify the strengths and limitations of market research, as well as the proper ways to gather and present information.

Note(s): HRCI--PHR, SPHR and GPHR general recertification credit.

Practical Design & Implementation of High Efficiency Switch-mode Power Supplies

3.0 Units

Students in this design-oriented course focus on how to do practical, high efficiency, switch-mode power supply designs that are implementable for mass production. Switch-mode power supplies are customized designs for specific hardware applications that significantly affect overall system

reliability and performance. It’s vital for any successful hardware development to understand the design and development of power supplies that focus on high efficiency. You will study systematic design approaches for the most popular topologies: the buck converter (non-isolated application) and the flyback (isolated application) in achieving optimal power conversion efficiency at the full and light load conditions. You will also learn practical switch-mode power supply and magnetics design knowledge to satisfy real market and regulatory requirements using practical circuit implementations.

The course features live hardware demonstrations, actual waveform observations of power supply behaviors, and practical design case studies.

Skills Needed: Basic knowledge/experience on switch-mode power supplies

Practical Design with Xilinx FPGAs

3.0 Units

Field Programmable Gate Arrays (FPGAs) are configurable logic devices with programmable links. They allow you to implement, update, and ship ASICs with low non-recurring engineering costs and are widely used in system design. This course offers a practical introduction to programmable logic design with Xilinx FPGAs, emphasizing design implementation. The course focuses on improving design methods to advance overall design quality; in essence, to bulletproof a design. Standard logic designs translate automatically and effectively to the world of field programmable logic devices. The course covers common methods based on design constraints used in most design software. You will learn design implementations such as clocking (which creates various clock frequencies from an external reference), including how to handle control and data signals migrating across different clock domains, how to manage clock jitter and debounce input asynchronous signals. You will also learn to manage ground bounce and control power dissipation, while including considerations for safety and security. Practical design examples include discussions of RAM, DSP blocks, basic fabric and A/D converters.

The course places an architectural focus on the Virtex-7, Artix and Kintex families, as well as the Zynq programmable system on a chip. In-class demonstrations and student design projects will feature the Xilinx Vivado Webpack design software. By the end of the course, you should be able to complete practical designs with Xilinx FPGAs and understand design and timing reports. The course includes a student project with design tools; real device implementation or programming is optional.

Topics Include:

Design guidelines and available resources

How to use the clock manager tools and timing constraints

How to cross clock boundaries and manage placement constraints

Two kinds of bounce management: Debounce switches and ground bounce

How to identify, estimate and control power dissipation

How to understand and mitigate single error upset effects

Introduction to security and safety aspects of FPGAs

Additional constraints

Note: Students are required to purchase a Zynq-based board for their project (approximately $100, not included in the tuition). Detailed board information and instruction will be provided on the first night of class.

Skills Needed: Experience with logic design of digital systems or equivalent knowledge. Familiarity with Verilog design language.

Practical DFT Concepts for ASICs: Nanometer Test Enhancements

3.0 Units

Below 45 nanometers, testing application-specific integrated circuits (ASICs) and system on chips (SOCs) becomes very challenging. The dense spacing of lines on silicon, gigahertz clock rates, newly-emerging fault classes—these factors make it difficult to reach even 98% coverage. This course is ideal for integrated circuit (IC) designers seeking a deeper understanding of test issues, or test engineers wanting to stay current with emerging trends and tools. This course is filled with engineering insights. It first builds a solid foundation in scan-based design —a necessary skill for understanding more recent techniques like delay-fault testing, scan compression, and built-in self test (BIST). Students will gain hands-on experience in building scan chains and generating test patterns, using Synopsys DFT Compiler (DFTC) and TetraMAX ATPG. You will learn advanced topics such as inserting multiple scan chains, employing sequential ATPG to handle non-scan flops, optimizing DFT logic, understanding LBIST and MBIST, and following nanometer trends in testing.

The systematic hands-on labs reinforce techniques introduced in lecture, and are packed with useful information and practical guidelines. By the conclusion of the course, you will be able to hand off a full-scan design and generate a high-coverage test program for nanometer ASIC.

Topics include:

Understanding scan-based design

Generating high-coverage patterns

How patterns are executed on the ATE

DFT rules; fixing rule violations

How to insert and customize scan paths

Delay defects and other fault models

Scan compression and reordering

Built-in self test (MBIST) for memory

Built-in self test (LBIST) for logic

Boundary scan for digital and high-speed serial

Skills Needed: A working knowledge of digital logic design is recommended.

Predictive Analytics: Applications of Machine Learning

3.0 Units

Over the past decade, machine learning has emerged as a critical research area with wide-ranging practical applications in engineering and commerce. Industries as diverse as retail, robotics, manufacturing, and social networking continually provide new examples. How do machine learning engineers know which techniques to implement in this dynamic and evolving field? In this fundamentals course, we prepare you to answer that question. Through hands-on activities you will begin to understand, build, and test machine learning techniques. You will receive a broad introduction to the key learning methods, including regression, classification, clustering, and recommender systems. The focus is not on individual algorithms but rather the ideas that make them work.

In addition to reviewing the steps involved in building predictive models, including data collection, feature selection, algorithms and evaluation, you will learn from case studies to fine tune the performance of these models and plan for practical implementation issues.

Using Python/R you will work with machine learning concepts, terms, and methodology gaining an intuitive understanding of the mathematics underlying it by building actual applications. The techniques you'll learn are the foundation for real-world applications such as classification, regression, image analysis, and bioinformatics. Pseudocode will be provided for most of the algorithms. Homework assignments are designed for in-depth practice.

By the end of the course, you will have a basic understanding of machine learning techniques and know how to apply basic machine learning tools in practical situations. You will have experience with methods to formulate and solve machine learning problems in Python/R and will have completed several assignments and a project using supervised or unsupervised learning algorithms.

Topics include:

Review of R/Python (NumPy, SciPy, pandas, Scikit-Learn, Matplotlib)

Fundamentals of machine learning

Linear regression and logistic regression

K-nearest neighbors (k-NN) and support vector machine

Bayesian classifiers: naïve Bayes

Decision tree and random forests

Unsupervised learning

Dimensional reduction: PCA, ridge regression and lasso methods

Performance evaluation

Brief introduction to deep learning

Skills Needed: Skills Needed: Basic programming experience is recommended. Python/R experience can be helpful. Basic knowledge of probability and statistics is required.

Preparing for FDA Inspections and Conducting Sponsor Audits

1.5 Units

In the regulated pharmaceutical and biotech medical device industries, inspections by government agencies are often a prerequisite for new product-marketing approvals. Knowing what to expect and how to prepare for and respond to such inspections is as critical as conducting sound clinical research. As the FDA and other regulatory authorities increase the frequency of inspections, it is imperative that everyone involved in the development of new therapies be familiar with government inspection processes and their role during these inspections. This course helps participants prepare for FDA inspections and conduct sponsor audits. Topics include:

Investigator and sponsor/monitor inspections

How and when inspections occur

FDA inspection procedures and practices

Conducting sponsor audits and inspections

Interacting professionally with inspectors

Responding effectively to inspectors' observations

This course benefits professionals involved in all aspects of clinical research including sponsor clinical development personnel, quality assurance and compliance, investigators, monitors, regulatory affairs personnel, data managers, and safety surveillance personnel.

Professional Credit: CA BRN/LVN Credit--Provider #CEP13114.

Principles of Business Analysis

3.0 Units

This course provides a sound foundation in business analysis concepts and lays the groundwork for advanced studies. You'll learn the Six Sigma techniques to define value; including the project management skills needed to plan, manage, and communicate; requirements management approaches needed to elicit, analyze, solicit, and verify requirements; and enterprise architecture techniques to promote knowledge retention, reduction of complexity, and reuse. Learn to control

your current business processes and derive business requirements for process and automation projects that add value to your organization. The course includes group and individual exercises, a threaded case study, and an action planning on-the-job (OTJ) implementation.

Upon completion of this course, you will be able to: Discuss fundamental business analysis concepts Distinguish between the roles of a business analyst and project manager Identify the key business analyst responsibilities and deliverables in each of the knowledge areas Identify stakeholders and select appropriate techniques for eliciting their requirements Understand the business analysis tasks necessary to complete a business analysis effort Describe how a business analyst works with stakeholders to identify and comprehend their needs Clarify needs and solutions with various stakeholder groups Define business analysis tasks that progressively elaborate stakeholder and solution requirements

Note(s): Professional Credit: Project Management Institute--PMP 20 Professional Development Units.

Principles of Educational Therapy

3.0 Units

This course provides an interactive overview of the educational therapist's role, including discussions of ethical practices, state and federal laws related to professional responsibilities and the therapist's limitations. The responsibilities of the therapist, including case management, information gathering, assessment practices, goal setting and intervention strategies are also examined.

Principles of Marketing

2.0 Units

Marketing is the convergence point for issues involving the customer, the competition and corporate capabilities. In product- or service-based industries, understanding marketing enables managers to work with greater insight and effectiveness. This course defines the fundamental principles of marketing in the contexts of the corporation, the economy and society. The course emphasizes the role of marketing in shaping and developing new ideas, the factors that affect pricing, channels through which products and services are distributed, elements of wholesaling and retailing, and the strategies, mechanisms and techniques behind advertising, direct sales and other forms of promotion. The impacts of changing lifestyles and international market forces on American buying patterns are analyzed; consumer and organizational buying behaviors are explored; and methods and resources for researching and segmenting markets are detailed. Discussions on careers in marketing, marketing management, and an overview of the world's leading markets and businesses are also provided. Note(s): HRCI--PHR, SPHR and GPHR strategic recertification credit; MCLE--Minimum Continuing Legal Education State Board of CA, 19.25 hours.

Printed Circuit Board Design for Signal Integrity and EMC Compliance

1.5 Units

This course presents simplified design techniques for the design and layout of printed circuit boards to achieve both signal integrity and electromagnetic compatibility (EMC). Signal integrity is a primary concern for system functionality while EMC compliance allows a product to be legally sold. This course was developed for both experienced and entry level engineers who are responsible for printed circuit board designs and system level products. Upon completion, students should be able to create a high-density, high technology printed circuit board that meets or exceeds test and system level requirements easily. In an informal tutorial format, design and layout techniques are introduced in a simple to follow step-by-step presentation that allows plenty of opportunities to address specific questions. Major instructional emphasis is placed on real-life examples that demonstrate good layout practices that can be incorporated immediately. Simulation results will be presented to demonstrate basic principles. This course is taught at the fundamental level, not tied to any PCB tool. Rigorous mathematical analysis and theory will not be presented. Multi-layer, high-density designs is the focus of the course, however, single- and double-sided designs are examined based upon fundamental concepts for multi-layer boards.

Topics Include:

Fundamental concepts of signal integrity and EMC

Material science related to construction of a printed circuit board

Suppression and grounding

Layer stackup assignments

Power distribution networks (bypassing/decoupling)

Transmission lines requiring impedance control and routing

Transmission line termination

Interconnects and I/O

Electrostatic discharge protection

Backplanes and large busses

Miscellaneous design techniques and concepts

Skills Needed: Prior experience with printed circuit board and system level design and testing is highly desired. A solid foundation in basic electrical engineering principles helps one understand fundamental design concepts. This course targets the spectrum of designers, from entry-level to senior engineer, including EMC engineers.

Procurement and Supply Chain Management Certificate Completion Fee

Once all of the certificate requirements have been met and your final grades are posted, please access your Student Portal to enroll in the “Certificate Completion Fee” to begin the review process. Please allow 4-6 weeks to receive your certificate.

Product Management: Moving the Product to Market

2.0 Units

This in-depth introduction to product management, product marketing and product marketing engineering covers everything from core concepts and terminology to process management. The course is designed to meet the needs of product managers, product marketing managers and product marketing engineers who are charged with driving products to market but who may be new to the disciplines and processes involved. Participants learn to manage the process of shaping final products and taking them into the marketplace all from the perspective of the customer advocate. Topics Include:

Concept of the 'whole' product and product lifecycle

Product planning, scoping markets, pricing and margins, forecasting Product management, MRD and PRD, roadmaps, metrics

Product packaging, costing, production

Product positioning, persona, promotion, launch planning

Product support for sales, channels, merchandising

End of life (EOL) planning

Analyzing customer needs

Researching and sizing markets

Evaluating competition

Developing product requirements

Assessing ROI

Managing product lifecycles

Working with engineering, marketing and sales

Working with sales channels

Programming for Cloud Computing: Amazon Web Services

3.0 Units

Amazon Web Services (AWS) is the leading Infrastructure-as-a-Service (IaaS) cloud provider. AWS provides a large suite of services - accessible via APIs - that are used to set up a "virtual" IT infrastructure, run applications in the cloud, and provide services to applications running outside of the cloud. This course focuses on the concepts and programming techniques used by both IT professionals and application developers to setup, configure, and deploy applications into AWS. The course also covers the use of AWS cloud services from applications and tools that run outside of the AWS cloud. The course will start with a brief overview of cloud computing that focuses on IaaS. Discussions will address the various AWS compute, storage, database, networking, messaging, monitoring, and deployment services as well as APIs including: EC2, Auto-Scaling, EBS, S3, SimpleDB, RDS, ElastiCache, Load Balancing, VPC, SQS, SNS, SES, CloudWatch, and Beanstalk.

Upon completion of this course, you will understand the technologies and tools used to work with the AWS cloud. You will gain hands-on experience through a class project that involves designing, coding, and deploying a cloud-focused tool or application. Students interested in an “IT-centric” project can use scripting languages (e.g. Ruby, Perl, or Python) to set up and manage an AWS cloud. Students interested in a software development approach can use programming languages such as Java, Objective-C, C#, or Ruby-on-Rails to develop and deploy an application that uses AWS Cloud services or resides in the AWS Cloud.

Topics include:

Review of cloud-computing concepts: scalability, cost, virtualization, IaaS

Accessing AWS: the AWS console

Using AWS services: using an AWS programming library

Compute: EC2, Auto-scaling, regions and availability zones

Volumes: EBS

Storage and database: S3, SimpleDB, RDS, ElastiCache

Networking: Load Balancing, VPC, Direct Connect, Route 53

Messaging: SQS, SNS, SES

Monitoring: Cloud Watch

Application deployment: Beanstalk

Note(s): There will be an additional cost for accessing AWS capabilities for class project. Cost may vary but is generally low.

Skills Needed: Experience developing programs in any of Python, Perl, Java, C# or Ruby.

Project and Program Management Certificate Completion Fee

Once all of the certificate requirements have been met and your final grades are posted, please access your Student Portal to enroll in the “Certificate Completion Fee” to begin the review process. Please allow 4-6 weeks to receive your certificate.

Project Integration and Risk Management

3.0 Units

In order to compete in today's economic environment, companies must be able to develop products and services rapidly and successfully. This course equips students with project-integration and risk-management tools and skills, including how to plan and organize projects, determine and manage product requirements, and handle project risks. Students will learn from a large number of exercises and case studies of successful and less successful projects. This course shows participants how to put powerful tools and techniques into practice and get outstanding results in industries such as systems, software, IT, Web, integrated circuits, hardware, services, medical,

biotech, and more. Topics include:

Integrating all aspects of a project

Managing project scope

Conducting efficient project status-review meetings

Eliciting, analyzing, and validating product requirements

Successfully managing project risks

The course is designed for project leaders, team members, engineering and marketing managers, directors and vice presidents, and provides a proven set of global best practices to help them achieve fast time to market.

Note(s): Project Management Institute--PMP 30 Professional Development Units; HRCI--PHR, SPHR and GPHR general recertification credit, 27.5 hours.

Project Leadership and Communication

3.0 Units

This course is designed to equip students with the "soft skills" needed for managing projects, including leadership, communications, team organization and development, conflict management, quality management, and negotiating. Using case studies and exercises, students explore vital aspects of project leadership such as the use of participative management to build commitment, leadership styles, organizational cultures and configurations, interpersonal skill development, project staffing, and working with distance-separated teams. Students also learn to establish clear project goals, overcome communication problems, write performance reports, and manage agreement. Topics Include:

Project leadership versus project management

Improving project communications

Building commitment to the project

Successfully managing conflict

Using the Johari Window to assess your interpersonal skills

Note(s): Project Management Institute--PMP 30 Professional Development Units; HRCI--PHR, SPHR and GPHR general recertification credit, 27.5 hours.

Project Management for Administrative and Executive Assistants

2.0 Units

This course helps executive assistants become proficient in the use of practical tools with a consistent project management approach that will deliver results more predictably, consistently,

and with less risk to the business. With these skills, participants will be able to embark upon complex projects with increased efficiency and greater confidence. Key areas include: Time management Project Management Essentials Business Case Solutions Personal organization Planning, calendaring and scheduling Travel Understanding Corporate Management Event planning

Psychology of Human Learning

2.0 Units

The principles of cognitive, developmental and social psychology, as they apply to the exceptional learner, are examined in this course. Current research is reviewed as it relates to individual differences, the learning process, and theories and problems of learning, including the impact of motivation and intelligence on the special learner. The fundamentals of physical, motor, social and emotional development at critical stages are examined. This course covers the key human learning theories, including classical, social, Piagetian, and information-processing perspectives.

Public Relations: Winning the Mindshare Battle

1.5 Units

In today’s world, the concept of mindshare is crucial to building successful public relations campaigns. Because customers have access to more information about a company, there is an increasing amount of public discussion about its activities, products and services. Without mindshare, marketing efforts can become misguided, superior technology fails to be adopted, and even the most promising companies fail to blossom. Yet winning the mindshare battle is more challenging than meets the eye. Today's public relations practitioner needs to be an integrated media person who can build trust and credibility by gaining exposure and creating an ongoing dialogue with customers. By leveraging a variety of readings, exercises, case studies and guest speakers, this course explores the power of public relations to build credibility, trust, goodwill and reputation. The course is a good fit for professionals at various stages of their careers who want a strong foundation in PR basics and are interested in building comprehensive PR strategies.

Topics include:

Communications channels

Trade shows and event management

Photography

Wire services

Search-optimized press releases

Editorial calendar management

Press conferences and press tours

Product reviews

Ongoing public relations management

Budgets for international PR

Spokesperson training

Crisis communications

In-house vs. agency PR

At the conclusion of the course, you should be able to: Define public relations

Describe a comprehensive view of public relations strategy

Apply a few key PR tools

Identify a career path in media and analyst relations, using diverse skills such as writing and editing, rich media, social media, communications planning, positioning and messaging, executive communications, or measurement and analysis.

Python for Data Analysis

3.0 Units

With data now being created at the rate of 2.5 quintillion bytes a day, there is a tremendous demand for people who can explore vast amounts of data. In this lab-based course, you will learn how to glean empirical truth from data using Python with Pandas, how to make the right decisions, and how to bring order from chaos.

Experience Python's straight-forward syntax, built-in data types, and object-oriented programming (OOP) and make your own data types. Learn how Python's brilliant architecture allows you to jump into any of more than 100,000 libraries provided for Python. In this course you work with the Pandas, Numpy, and Matplotlib libraries to inspect data, manipulate data, calculate statistics, and provide informative and beautiful visual representations for data sets via interactive Jupyter Notebooks. Skills Needed: Helpful, but not required, are a basic experience in any programming language and a rudimentary knowledge of statistics.

Python for Programmers

3.0 Units

Python language is gaining popularity because its use enhances program correctness and increases programmer efficiency. Because of its clear and elegant syntax, dynamic typing, automatic memory management, and straight-forward module architecture, Python is simple to learn and fun to use. Its code is easy to read, write, extend and modify. This lab-based course offers proficiency in the core concepts of Python, and the skills and knowledge for building applications using any of the tens of thousands of task-specific Python libraries. Topics include:

The Python environment and code introspection

Syntax: flow control, function protocols, exception handling and functional programming

Built-in data types: strings, tuples, lists and dictionaries

Object-oriented features: classes, inheritance and overriding

Building applications, packages, and libraries

Popular libraries: os, sys, regular expression, random, shelve, cgi, urllib, and more

Pythonic thinking, iterators, generators, decorators, and context managers

Note(s): The Python interpreter is free software and runs on all popular platforms.

Skills Needed: Significant experience in any programming language.

Python: Object-Oriented Programming

2.0 Units

Demand for Python programmers who understand the latest skills in today's fastest growing computer language, grows every day. Object-oriented programming (OOP) has become a must-have technique in today's high-tech software development jobs.

In this intermediate course, students will use Python to explore OOP techniques including: encapsulation, polymorphism, and inheritance. The material is introduced and explained through the development of graphical user interface elements and, in a fun way, by building highly approachable, simple computer games. The Python language, because of its simple syntax, makes the implementation of OOP very clear. To build interactivity, we will use the well-known Pygame extension to introduce event-driven programs. Along the way, you will gain an intermediate level of understanding of the Python language. After this course, you should be able to translate the underlying concepts to other OOP languages with ease.

Topics include:

Object-Oriented Programming: Encapsulation, Polymorphism, Inheritence

Intermediate Python

Event-driven systems

Building graphical user interface elements

Simple games

Prerequisite: “Python Programming for Beginners” or a similar introductory Python course.

Python Programming for Beginners

1.5 Units

This hands-on, lab-based course is intended for newcomers to programming. Python is favored by first-time programmers because it presents engineering concepts in a straight-forward, clear language, while quietly and behind-the-scenes, it takes care of the difficult, tedious and error-prone details that present the major obstacles to writing a program in older languages. Python is an open-sourced language with rich features and is used extensively in the industries. The course covers the important concepts and programming mechanisms that exist in all programming languages: reading and writing to standard IO, using operators, controlling the flow of execution, using functions, reading and writing files, and object-oriented programming concepts. It also includes Python specific facilities such as code re-use, built-in sequence types, and iteration. Interactions and expert help are available.

Note(s): If you are already familiar with any programming language, the pace of this course may be slow. If you have a basic understanding of Python, you may want to consider the intermediate level "Python: Object-Oriented Programming" (CMPR.X420). More experienced programmers should take "Python for Programmers" (CMPR.X416).

Quality Systems for Medical Devices: FDA QSR and ISO 13485

2.5 Units

Through a series of lectures, interactive discussions and case studies, this course provides in-depth exposure to the fundamental concepts and major issues central to regulatory compliance in the medical device sector. The course emphasizes using the principles of the medical device quality system (QS) regulations and ISO 13485 as tools to take a process-oriented, risk-based approach to compliance, while achieving strategic business objectives in today's dynamic regulatory environment. You will learn about key processes in the quality system medical device regulation (21 CFR 820) and ISO 13485, while learning how to address noncompliance challenges from a practical standpoint. The instructor provides insight into implementing an effective CAPA system and using it as an improvement tool. The course also discusses current industry trends, FDA initiatives, best practices for interacting with regulatory agencies, and a brief overview of the FDA Quality System Inspection Technique (QSIT) and Medical Device Single Audit (MDSAP) programs. formerly titled Medical Device Quality Systems Topics include:

"GXPs" and how they relate to each other

The FDA QS Regulation vs. ISO 13485, including updates to ISO 13485:2016

Regulatory intelligence resources

How to use principles of the FDA Quality System Regulation to critically analyze a real-world company

How to prepare and host regulatory inspections and use the quality system as a tool to achieve strategic business objectives

Note(s): This course was formerly titled "Medical Device Quality Systems."

Real-Time Embedded Systems Programming, Introduction

3.0 Units

A real-time embedded system is designed to monitor and respond to external environments within a time deadline. A wide variety of devices that you see on the market today fall into this category - personal health and fitness trackers, smart thermostats, home security systems, and smart video cameras, to name a few. These systems interact with the environment using a variety of hardware and software interfaces. The embedded software manages these interfaces and makes sure that the tasks are accomplished within tight timing constraints. The Real Time Operating System (RTOS) on these devices is responsible for scheduling independent tasks and managing processes. This introductory course provides a foundation in the features and programming models of real-time embedded systems with hands-on learning. The course introduces the fundamentals of real-time scheduling and resource management protocols that are essential in designing and building commercial products and covers the use of RTOS to effectively design tasks and device drivers to meet real-time requirements. You'll learn about important topics in real-time systems, such as priority-based real time scheduling, interrupt handling, using timers, and detecting and preventing deadlocks. The course will also discuss multi-threading, cooperative versus preemptive multi-tasking and inter-process communications, focusing on programming in FreeRTOS and understanding internals such as schedulers and idle tasks.

You'll design and code a real-time embedded systems project in C language on an open source FreeRTOS emulator. Upon completion of the course, you'll understand real-time embedded systems programming and the interactions of hardware, software, and the OS in such systems.

Topics include:

Introduction to real-time embedded systems: attributes and examples

Object-oriented view of RT embedded systems

Layered architecture of RT embedded system: hardware to applications

RTOS concepts

FreeRTOS and implementation

Introduction to other RTOS-es and layers

Design projects

Skills Needed: A strong background in C programming and an understanding of embedded system architecture.

Regulation of Drugs and Biologics

3.0 Units

Complex regulations govern the development, manufacture, and commercialization of biomedical products. This course will help you understand the regulatory requirements, both U.S. and international, for patented and generic pharmaceuticals, over-the-counter drugs, and biological

products. Through lectures, case studies, and hands-on exercises, you'll gain knowledge and insight into the regulatory agencies and their roles and responsibilities, regulatory applications and pathways, post-marketing requirements, the impact of regulatory differences between U.S. and other countries, and how regulatory approval processes affect corporate strategy.

Regulation of in vitro Diagnostics in Europe and the US

2.5 Units

This course offers a comprehensive overview of the current European and U.S. Regulatory and Quality Affairs for in vitro diagnostic (IVD) products. You will gain a perspective on the critical elements of the regulatory requirements for obtaining IVD marketing approval. This course will take an extensive look into specific in vitro diagnostics topics and learn about the new and emerging regulatory requirements surrounding them. Learn about the impending transition for IVDs from the current European Directives (IVDD) to new substantially different European Regulations (IVDR), which will bring a majority of currently self-declared IVDs to require Notified Body involvement. Skills needed: "Quality Systems for Medical Devices: FDA QSR and ISO 13485" or working knowledge/experience in Quality Systems is needed.

Regulation of Medical Devices and Diagnostics

3.0 Units

What's the origin story of a medical device? Medical devices encompass a broad array of products, ranging from the tongue depressor to surgically implanted stents and pacemakers. This course provides individuals from all backgrounds with a solid grounding in the laws, regulations and institutions that underlie the process of medical device and diagnostic product development and marketing. The instructor first defines medical devices, provides an overview of the medical device industry and the historical roots of medical device regulation. You'll learn the unique aspects of medical devices and the pathways through which various classes of product are moved into the U.S. marketplace with a brief comparison to OUS approval processes.

Through lectures and case studies, you'll gain in-depth exposure to key routes to market, including 510(k) premarket notification and premarket approval applications (PMA). The instructor provides insight into the rationale and strategies for using each of these paths and others. You'll also learn the pre-clinical and clinical testing of devices, the investigational device exemption (IDE) application and process, and international laws and regulations as they relate to the U.S. counterparts.

The instructor also details post-marketing issues, including recalls, corrections and removals, as well as medical device surveillance and reporting requirements. The course also highlights current industry issues such as stand-alone software, IVDs, combination products, distribution of off-label information, physician payments, and more.

Note(s): Individuals who have taken "Introduction to Medical Device Regulation" or "Medical Devices: Regulatory Strategies and Marketing Pathways" at UCSC Extension within the past three years can use it to partially satisfy the requirement for "Regulation of Medical Devices and Diagnostics" in the Regulatory Affairs Certificate Program. Rather than taking the complete "Regulation of Medical Devices and Diagnostics" course, these students can enroll in "Medical Device and Diagnostics Bridge. Please contact tdoyle@ucsc.edu for enrollment information.

Individuals who are pursuing the Medical Devices Certificate Program who have already completed the "Introduction to Medical Device Regulation," do not need to retake the "Regulation of Medical Devices and Diagnostics" course.

Regulatory Affairs Certificate Completion Fee

Once all of the certificate requirements have been met and your final grades are posted, please access your Student Portal to enroll in the “Certificate Completion Fee” to begin the review process. Please allow 4-6 weeks to receive your certificate.

Regulatory Submissions: Devices and Diagnostics

2.5 Units

This course is designed to provide individuals with pragmatic knowledge of how to craft medical device submissions for approval by the FDA. Students should already have a foundation in medical device terminology, classification, and regulations prior to taking this course. Through lectures, case studies, and hands-on exercises, new and experienced regulatory professionals learn how to work with the regulations, guidance documents, and style guides to write portions of key medical device submissions that both comply with the requirements and are clear to the reviewers. Students explore the content and process of medical device submissions, as well as gain insight into timelines, important strategic considerations and business impacts. Topics include:

510(k)s: Traditional, special, abbreviated

Crafting substantial equivalence justifications

Determining testing requirement

Modifications to 510(k) devices

PMAs and their supplements

IDE

Warning letters

Adverse event reporting

Communicating and negotiating with the FDA and internal customers

This hands-on course requires substantial out-of-class work on a submission project, where you will be crafting a 510(k). Please plan your schedule accordingly.

Regulatory Submissions: Drugs and Biologics

2.0 Units

Submissions to a regulatory agency such as the FDA involve more than just writing. They also encompass strategy, editing, publishing and systematic tracking of key information. Through lectures, case studies, and hands-on exercises, new and experienced regulatory professionals learn how to work with regulations, guidance documents and style guides to produce submissions that comply with the requirements and are clear to the reviewers. In this practical course, approved drug labels and summary basis of approvals are used to help students acquire the knowledge and insight needed to understand and begin to construct core U.S. drug and biologics submissions,

including pre-marketing (IND), marketing (NDA/CTD) and post-marketing documents. Students also gain experience with tools that help manage timelines and sections needed from contributors.

Note(s):To get the most from this course, students should have strong English communication skills and ready access to a computer.

Relational Database Design and SQL Programming

2.0 Units

Most business and technical data consists of multiple tables with interlocking relationships. Such databases must provide reliable storage, transaction management, access security and multi-user support. In this course, you will learn the concepts and design for a Relational Database Management System (RDBMS) and focus on the Structured Query Language (SQL) to define and manipulate data. The course covers how to create conceptual, logical and physical designs of relational databases in response to a set of user requirements. Instructions will be provided through the use of several case studies. You will learn design methodology, entity-relationship diagrams (ERD) and normalization principles. You will use an Oracle database to design the ERD and implement a working database. SQL is the query language used to access, maintain and share data with the relational database. You will learn methods for producing readable output, creating and manipulating tables and creating and managing constraints using SQL.

The concepts and SQL language learned here apply to all major RDBMS. You will gain understanding of the relational DB and have hands-on experience in creating database and working with data. The instructor recommends MySQL as an example database.

Topics Include:

Relational database concepts

Entity-relationship model

Normalization

SQL basics

SQL functions and operators

Restriction and formatting

Sorting and aggregating data

Transaction management and stored procedures

Combining queries with set operators

Managing tables and database performance

Skills Needed: Familiarity with general database concepts and ability to install software or databases on a personal computer.

Responsive Web Design with Open Source Frameworks

2.0 Units

Formerly: 30449 Web Design Using Open Source Design Patterns, Libraries and Frameworks

The open source community has provided high productivity, fast-track alternatives to using commercial tools in Web design. This course introduces design patterns as a technique for rapid website production and provides an overview of open source libraries and frameworks to add to the designer's toolbox. Today's professional designers have embraced grid standardization and responsive design layouts with frameworks like Twitter Bootstrap, Foundation, SemanticUI, Material Design and more. By working with a set of proven design patterns rolled into a well-tested framework, the designer can create a website for all contemporary viewports with the least amount of trial and error. This intermediate web design course focuses on Twitter Bootstrap for responsive designs that work on all modern devices. The course covers techniques for building engaging websites efficiently that work on a full range of desktop and mobile devices, and includes basic interactivity such as image sliders, date pickers and animation. You will learn the naming conventions within Bootstrap and Foundation frameworks and explore their capability for building semantically correct and cross-browser compatible websites with JavaScript enhancements for better engagement and usability. You will also learn to evaluate several usability examples and JavaScript implementations, how to select the right library based on the design requirements, and how to use some of the available special application JavaScript libraries.

This is an applied course for the students who have successfully completed the HTML, CSS and introduction to JavaScript courses (or who have equivalent experience). It does not cover any content management system implementations or PHP.

Topics include:

Definition and value of design patterns

HTML/CSS design patterns

Examples of how companies standardize with internal design patterns

The Twitter Bootstrap design pattern

Components in the Twitter Bootstrap framework, including the jQuery slider

The Foundation design pattern

How to implement interactivity in a Foundation design

Alternative JavaScript libraries for page load optimization

Other special application JavaScript libraries

Skills Needed: Students must have a working knowledge of HTML, CSS and a basic understanding of JavaScript function calls and variables.

Risk Management for Regulated Industries

3.0 Units

This course discusses how risk management is applied in the medical device, biotechnology, pharmaceutical and in vitro diagnostic (IVD) industries. Lectures and workshops delve into risk management concepts and tools, including hazard identification, hazard analysis, fault tree analysis, failure modes and effects analysis (FMEA), Hazard Analysis and Critical Control Point (HACCP), mitigation application, regulatory requirements, the creation of risk management plans, reports and files, how to conduct Risk Management Reviews, and what might be audited in your Risk Management System. By the end of the course, you'll be able to conduct risk management for a variety of products, processes and services within the biomedical industries and beyond.

Prerequisite(s): Students need to possess reasonable experience, background, and/or theoretical knowledge of medical devices, diagnostics or pharma. "Quality Systems for Medical Devices FDA QSR and ISO 13485" formerly titled "Medical Device Quality Systems" and "Introduction to Medical Device Regulation," or "Regulation of Medical Devices and Diagnostics," or "Medical Devices: Regulatory Strategies and Marketing Pathways," or equivalent experience.

Risk Management in Personal Financial Planning

3.5 Units

This course provides a survey of risk management with a focus on applying the fundamentals of risk management to such personal issues as premature death, medical costs, long-term care, property and liability exposures. After a review of the fundamentals of risk management, this course covers the techniques and strategies of risk management, including the use of various forms of insurance and risk retention and reduction. You'll use readings, case studies, in-class discussion, and a review of real-world situations to understand of the often-overlooked, yet critically important, dimensions of personal risk management.

Role of the Project Manager

1.5 Units

The primary objective of this course is to acquaint students with a broad overview of project management and the roles that a project manager plays in the five primary processes involved in managing projects. In this course, the skills needed to successfully play these roles are identified and discussed. In addition, learning the life cycles of typical projects provides a basis for understanding the variety of skills needed, how these skills can be assembled, and how they relate to each other. Informal case studies and exercises are used to illustrate application of these skills. Topics include:

An overview of the five primary project-management processes

Writing an effective project plan; developing successful project schedules

Executing and controlling the project plan

The "triple constraint" and how it affects the project manager

Understanding project phases and project life cycles

Note(s): Project Management Institute--PMP 15 Professional Development Units; HRCI--PHR, SPHR and GPHR general recertification credit, 13.75 hours.

Schedule Optimization Techniques for Managers

1.5 Units

As time-to-market reduction drives organizations to shorten their schedules, managers strive for optimal scheduling of people and other resources to keep project duration to a minimum. Recent developments in scheduling theory have provided managers with new techniques to find the best schedule for each project. These techniques take into account such factors as tasks of varying duration, precedence constraints, resource capabilities, resource loading, and business objectives. This course presents several scheduling techniques that can be used for various projects including techniques for scheduling simultaneous projects in a matrix organization. Students are shown step-by-step examples of each technique and then work through several exercises in class. Participants learn how to select the best scheduling technique for a particular business objective and how to use schedule performance metrics to evaluate the effectiveness of the optimization techniques.

Note(s): Project Management Institute--PMP 15 Professional Development Units.

Science of Clinical Trials Design

2.5 Units

This course reviews the science that forms the basis of effective clinical trial design. You'll learn to classify and describe trial design by stage in drug and device development. The course covers the purposes of clinical trials, including types of trial designs. You'll learn to define hypothesis and study objectives and determine population and sample size. Additional topics include:

Study procedures

Stopping rules

Basic protocol

Local standards of practice affecting clinical trials

Safety information measures

Scientific and ethical considerations

Validity of design, execution, analysis and reporting

Pharmacoeconomics

Merging phases for economic and marketing purposes

Multiple endpoints

Working with marketing to identify unmet medical needs

You'll gain hands-on experience designing clinical trials synopses and Phase 2 development strategies.

Professional Credit: CA BRN/LVN Credit - Provider #CEP13114.

Science Play: Inquiry-Based Learning Made Easy

1.0 Units

Young children ask a lot of questions. They are naturally curious about the world around them. Through playful science activities, teachers of young children can leverage that curiosity to create inquiry-based learning investigations. This course explores how easy it is to design an inquiry-based investigation using hands-on experiments, games, puppet shows, story books, and more. Lesson plans, mathematics connections, and California learning foundations in science will be discussed in the broader context of early childhood education. Science Play will inspire you to expand your comfort with science education and feel confident teaching science while keeping it developmentally appropriate and highly engaging.

Educators will learn to design hands-on lessons and units that connect to general curricular topics incorporating circle time activities, puppet shows, literature connections, and ideas for extending investigations. You will also learn inquiry-based and emergent science curriculum development, including methods for teaching children to document their own experiments and observations, and ways to document and communicate classroom science learning for parents and colleagues. Grades are based on reflections, lesson plans, and class participation.

As a foundation for understanding science principles appropriate for the early childhood classroom, the course examines the California Preschool Learning Foundations in science, as well as science position statements from the National Science Teachers Association and the National Association for the Education of Young Children.

Search Engine Marketing

2.0 Units

Your web site is your marketing window to the world. But how will the world find you and will they stay once they arrive? How can you score better with search engines by having an active organic search (SEO) program? When does it pay to advertise online and use SEM/PPC campaigns? What are the options? How do I track spending and results? How do I use Social Media to improve my search engine rankings and what tools are available? Find answers to these questions and learn to create a complete and effective Web-marketing program. This interactive, hands-on course employs live case studies and projects to explore the uses of blogs, micro-blogs, animation, videos and online competitions. Bring your own interactive marketing needs to class and learn first hand how to cut through the noise and promote your company and products online.

Search Engine Optimization: Gain as much as exposure as possible through organic search

Search Engine Marketing: Get results from pay-per-click and other ad programs

Using Social Media to help build your search marketing programs

Beyond Google and Bing: The other ways to win online

Measurement and analytics: Major tools and statistics

Lead tracking and conversion

Tie-ins with other marketing communication programs including integrating email, display and print.

*See section notes for Required Tools and Materials.

Social Media Marketing Fundamentals

2.0 Units

The contemporary marketing toolset has expanded dramatically with the mainstreaming of digital technologies, bringing social media skills into high demand for marketers and professionals in many other careers. Students in this course focus on digital technologies and the tools used to compete for customers in the digital economy. You will gain an understanding of key social media channels—Facebook, LinkedIn, Twitter—as well as branded communities, Google+, blogs, and video and learn how they fit into B2B and B2C marketing strategies. Explore how messenger apps have unalterably affected marketing, and practice online market research fundamentals and sponsored content campaigns. Emphasis is placed on best practices and on conveying an understanding of how you can leverage social media to create measurable business results. You will create a basic social media marketing plan and understand how it adds value to particular job functions so you can exceed performance goals.

A background in marketing is recommended for this course—preferably Implementing Winning Marketing Strategies or Principles of Marketing.

Note(s): MCLE--Minimum Continuing Legal Education State Board of CA, 19.25 hours.

Social Media Marketing Professional Award Completion Fee

Once all of the professional award requirements have been met and your final grades are posted, please access your Student Portal to enroll in the “Social Media Marketing Professional Award Completion Fee” to begin the review process. Please allow 4-6 weeks to receive your certificate.

Software Development Standards, Quality and Customer Experience Measurement

2.0 Units

Meet your anticipated outcomes by understanding how standardization leads to greater collaboration and promotes seamless interoperability, predictability and precision. In this course you learn to achieve software process improvements through the use of the latest software and systems engineering standards, such as ISO, TL, De Facto, IEEE, openGroup, and ITU. Examine the standardization process and issues arising from the control and evolution of standards and how standards can be customized to impact product quality. Learn about quality elements such as phase containment concepts and its implementation challenges. Learn a method to catch them and measure the quality at each stage and focus on customer experience concepts. These best practices for development lifecycle process standards will help you achieve required customer outcomes.

In this course you will learn:

The definition of standardization

Various standard bodies, their objectives and requirements

Standardization and its impact on software quality

Certification process and challenges

Phase containment concept and implementation challenges

Quality measurements techniques

Customer experience concept and measurement

Skills Needed: Some programming language experience and knowledge of Microsoft Office

Software Engineering and Quality Certificate Completion Fee

Once all of the certificate requirements have been met and your final grades are posted, please access your Student Portal to enroll in the “Certificate Completion Fee” to begin the review process. Please allow 4-6 weeks to receive your certificate.

Software Quality Assurance and Testing

2.0 Units

The requirements for high-quality, reliable, predictable software becomes increasingly necessary as its use continues to grow both generally and in mission- or life-critical environments. As the software industry evolves, the need for qualified engineers trained in the principles, methodologies, techniques and tools of software quality assurance has grown. This course presents the specifics of software quality assurance and software testing. The course also describes how these processes fit into the software development process. Topics include:

Process and product quality

Building an effective SQA organization

Techniques and content of an SQA plan

Software quality standards

Overview of test cycles

Test planning

Software inspections

Basic concepts of measurements

Software development, Total Quality Management and risk management

Software Value Engineering, Monetization Methods, Techniques & Industry Practice

2.0 Units

Learn how to find new value from software and hardware products, boost corporate revenue streams and become a hero of business growth in any organization. Value Engineering (VE) is a systemic method of monetizing assets. Students learn to work with the ratio of function to cost, and gain a significant competitive edge in our digitized world. With cloud adoption, virtualization, mobile technology advancements and increased end-user expectations, companies are changing the way they engage with their end users and product / solution offerings. In this course, students learn to go beyond traditional monetization practices of collecting and protecting revenue. They learn best practices to enable and sustain revenue streams.

Topics include:

Value discovery, realization and valuation

Technical debt management

Strategy and modelling end of life and end of services of assets

Digital transformational opportunity creation

Supply chain optimization

Understanding software monetization

Recurring, subscription and licensing business models

Innovative customer success stories

Skills Needed: Basic Knowledge of software development process and testing methodologies. Any one programming language experience (eg: C or C++) and knowledge of Microsoft Office tools.

Statistical Analysis and Modeling for Bioinformatics and Biomedical Applications

3.0 Units

This course introduces the essential probabilistic and statistical methods used in bioinformatics and biomedical research. You'll learn the fundamentals of probability, including first notions, probability axioms, conditional probability, random variables (discrete & continuous), probability distributions, expectation and variance, inferring a binomial proportion, the normal distribution, and the central limit theorem. The course also covers statistics, including the following topics:

Estimating statistical parameters and fitting them to probability distributions

Testing hypotheses and assessing goodness of fit

T-tests and confidence intervals

Analysis of variance (ANOVA)

T-test versus ANOVA analysis of microarray data

Relevant applications, including stochastic processes, Markov chains and hidden Markov models, pairwise alignment using HMMs, statistics applied to machine learning, probabilistic graphical models, and the Broad and Bayesian approaches to testing a null hypothesis

You will learn the basics of the R programming language in R-based labs using applications of the theory. Lab exercises will teach you to infer a binomial population, conduct R analysis and statistical analysis of microarray data, analyze t-tests versus ANOVA and pairwise alignment using HMMs. The course also introduces the popular machine learning software known as Weka.

You will be graded on a number of homework assignments, one midterm and a final project. Lab assignments are not turned in. Calculus is not required to achieve a passing grade in the class, but familiarity with it is helpful to understand the conceptual framework. Online lecture notes outlining this knowledge will be provided. Previous programming experience is not required.

Note(s): This course was formerly titled "Data Analysis and Modeling for Bioinformatics."

Statistics

5.0 Units

This course explores the fundamentals of statistical methods and reasoning. Topics include descriptive methods, data gathering, probability, interval estimation, significance tests, one- and two-sample problems, categorical data analysis, correlation and regression. The instructor will demonstrate the use of spreadsheets and statistical software to analyze and interpret data. Examples are drawn from a variety of fields including biology, business and marketing. While not too mathematically rigorous for the novice, the course provides some mathematical detail to illustrate basic concepts. No prior background in calculus or statistics is required.

Stem Cell Biology

1.5 Units

California is at the forefront of stem cell research and the industry continues to offer exciting opportunities in the Bay Area. This introduction to stem cells and their applications is geared towards professionals in the pharmaceutical, biotech, medical device, and healthcare industries. It addresses the basic biology and clinical applications of embryonic and adult stem cell therapies, provides a market overview of stem cell startup companies, and touches on the FDA regulation of biologic products. This course prepares students conceptually and technically for the emerging stem cell and biologics therapy market. Skills Needed: Basic cell biology knowledge is recommended but not required.

Professional Credit: CA BRN/LVN Credit--Provider #CEP13114.

Storage Technology in Data Centers

3.0 Units

The data center is becoming the hub of Information Technology in today's enterprises. The industry is trending toward software-defined data centers (SDDC), where the majority of infrastructure is virtualized and delivered "as a service". Such software-configured, hyper-converged data centers allow IT professionals to meet the demands of scaling, performance, capacity and multi-tenancy. This course is an in-depth exploration of the technologies needed to overcome these challenges. The course introduces the fundamental building blocks of enterprise storage such as SAN, NAS, Fibre Channel (FC), Fibre Channel Over IP (FC/IP), FCoE, and the core concepts of block, file, and object storage. It demystifies today's storage technologies in flash, cloud, mobility, converged storage, software-defined storage, SDDC, and Big Data storage. The course also covers the blueprint of cloud computing and the implementation of public, private and hybrid cloud storage.

By the end of the course, you will understand the essential storage and network virtualization technologies used in today's data centers, as well as how to establish a baseline for performance, capacity and ROI.

Topics Include:

Disk drive technologies

Review of DAS, SAN, and NAS technologies

Underlying storage and network storage protocols such as FC, IP, FCIP, iSCSI, FCoE

Flash and semiconductor storage and tiering

Converged and hyper-converged storage

Meeting SLAs, RTOs and RPOs

Replications and snapshots

Storage and network virtualization

Data Storage and Big Data analytics

Private, public and hybrid cloud computing

Note(s): Registered students will be invited to join the NetApp Certified Storage Associate (NCSA) program, which grants them free access to additional online courses and online lab exercises that cover NetApp storage configurations. Students will also receive a voucher applicable toward the NCSA certification exam fee. Participation is optional.

Skills Needed: A basic technical understanding of networking and storage concepts and terminology.

Strategies for Learning Differences in Mathematics

3.0 Units

This course deals with two key areas of math learning: computation and problem solving. You will learn the background of “mathematics differences” and strategies for dealing with math anxiety, risk factors, and the importance of developing “number sense.” Important elements of mathematical reasoning will also be addressed, including the role of attention, memory, and language in math. You’ll learn the use of multisensory math and gain strategies for improving long-term and working memory capacity through case studies of students with math learning differences.

Supply Chain Decisions and Data Analytics

2.0 Units

Data analytics is a growing market that takes advantage of the seemingly endless data that is available to us. This course will cover hypothesis testing, linear regression and factor analysis, along with the computer programs needed to analyze the data. Students will gain an understanding and appreciation of data analytics, so that they can apply it to make sound decisions in the business world.

It is highly recommended that students take "Evolving Role of Supply Chain Manager" as the first course prior to taking this course.

Learning Objectives Acquire an understanding of data analytics

Apply data outcomes to real life business situations

Evaluate different data and information types methods and models

Understand leading trends in the use of customer data

Identify key areas in the supply chain where data analysis is the most relevant

Topics Covered Data analytics and business decisions

Decision analysis methods

Developing key performance indicators

Data collection and data integrity

Data analysis and linear regression

Data improvement plans

Supply Chain Operations Management

3.0 Units

This course covers operations from a supply chain perspective from understanding the importance of processes and process thinking to managing the flow of products, services and information. You will learn how the various partners and functional groups are becoming more integrated and how they interact with each other. Students will be able to define and describe the different planning activities required to manage operations across the supply chain from the supplier to the customer.

It is highly recommended that students take "Evolving Role of Supply Chain Manager" as the first course prior to taking this course.

Learning Objectives Discuss supply management and its role in an organizational setting

Acknowledge the importance of quality management and the use of quality management (QM) tools

Compare the various process technologies applied to production and service operations

Topics Covered Concepts of operations management, strategy, and innovation

Managing processes and capabilities

Quality management principles

Leadership and client engagement

Customer service and relationship management

Inventory management and forecasting

Managing projects and change

Sustainable Supply Chain Strategies

1.5 Units

It can be said that every purchase has hidden social, environmental, and financial impact. What products are today's companies buying and how do they impact future generations? This class will discuss strategies that leading organizations throughout the world employ in their day-to-day procurement decisions. These include the use of products that minimize harm to the environment and human health, as well as purchasing decisions that support local communities and small businesses. All sectors are implementing procurement practices that promote equity and diversity, and require a certain level of performance by suppliers.

It is highly recommended that students take "Evolving Role of Supply Chain Manager" as the first course prior to taking this course.

Learning Objectives Acquire an understanding of sustainability and its impact globally

Consider attributes of sustainable products and services

Identify key terminology associated with sustainable procurement

Gain an appreciation for the importance of diversity and equity in procurement

Topics Covered History and definition of sustainability

Corporate social responsibility and leading practices

Green product resources and industry tools

Third party certifications and greenwashing

Closed loop supply chains

Trends in green procurement

Switching and Routing

3.0 Units

Bridges, switches, and routers comprise the foundational hardware that make up layers 2 and 3. This course focuses on the operation of devices, protocols, and algorithms that make these layers interoperate. Coverage of routing and switching will provide the logic and understanding of how packets are routed through a TCP/IP network and are passed between layers 2 and 3. Topics include:

Introduction to the OSI and TCP/IP models of internetworking

The medium access sublayer and data link layers

Cisco Command Line Interface and basic switch/router configuration

Spanning Tree, Source Routing, VLAN, MPLS Tagging, 802.1x Protocols

Forwarding/Filtering Operations of Bridges and Switches

Routing protocols: RIP, OSPF, BGP and EIGRP

Network management techniques and technologies

This course is taught using Cisco routers and switches in the lab. So students will gain hands-on experience working with the principle hardware in widest use, including operational premises and algorithmic decisions. Students will also learn to configure routing protocols and troubleshoot the network using Cisco IOS commands.

Skills Needed: Knowledge of TCP/IP, completion of a data communication or networking course, or equivalent experience.

System and Functional Verification Using UVM (Universal Verification Methodology)

3.0 Units

Universal Verification Methodology (UVM) is the industry standard for functional verification methodology developed by key EDA vendors and industry leaders. It uses a SystemVerilog-based, OOP-centric approach to improve interoperability and code reusability. In this course, you will use the OOP testbench knowledge learned earlier to create a full-fledged, flexible verification environment for solving today’s increasingly complex functional verification challenges. You will also gain real-world, hands-on experience developing an industrial-strength UVM-based testbench that is layered, interoperable, constrained-random, and coverage-driven. The course introduces the UVM architecture; its core set of base-classes and utility methods, and associated factory automation techniques. This framework forms the basic building blocks that facilitate the development of layered, modular, scalable, and reusable verification environments in SystemVerilog. You will be immersed in the practical application and deployment of UVM base-classes, understand their role in the verification environment to reduce design time and risks, as well as increasing quality and efficiency. The main base-classes covered are the UVM test

classes, sequence classes, component classes, messaging and reporting mechanism, factory, configuration database, transaction-level modeling (TLM), scoreboarding, coverage and phasing mechanism. You will learn the power of UVM for successfully designing complex constraint-random coverage driven verification projects.

Concepts introduced in class are reinforced in the lab. In addition to in-class hands-on labs and weekly take-home assignments, you'll work on a project to build an advanced UVM verification environment for a selected application with transaction-level and layered architecture. You will form a project team, create a test plan, develop a UVM-based verification environment, perform functional coverage, and submit a complete project report.

Skills Needed: Students should have experience with object-oriented programming, C/C++, or have taken "Advanced Verification with SystemVerilog OOP Testbench" course. Prerequisite topics will not be repeated here. Hardware verification experience is helpful.

SystemVerilog Assertions and Formal Verification

3.0 Units

As more functionality is packed onto denser chips, including system-on-chip (SoC) designs, verification can become a daunting task. Leading design and verification teams are using the power of assertions to manage their verification challenges through both simulation-based and formal property checking verification methodologies. While simulation-based verification accounts for the majority of verification activities, Formal Verification (FV) has matured to complement the simulation in order to verify complex and control-oriented design blocks. This course introduces SystemVerilog Assertion (SVA) concepts and syntax, using small examples and a realistic design. It covers a range of topics, from the basics of the SVA constructs to the OVL checker library. It also covers writing and debugging assertions in the design using advanced SVA constructs. You will learn to write assertions for formal verification. The second part of the course introduces formal verification theory. You will run the formal tool, debug a counter-example, and learn the refinement process. The course covers FV application in several design stages and in different functional areas such as SoC connectivity, coverage closure, and x-propagation checks.

The lab-based course covers key topics in detail, from language constructs to assertion coding guidelines that include practical examples of how to use assertions in verification. You will also learn methodology choices and assertions in a formal context. The course provides hands-on exercises using assertions, dynamic simulations (VCS) and formal or semi-formal verification (Verification Compiler - Formal).

Topics include:

Introduction to SVA

SVA checker library

SVA basic and advanced constructs

Introduction to formal verification and tools

Use of SystemVerilog Assertions in Formal Verification

Case studies and labs

Applications of Formal Verification

Skills Needed: Knowledge of basic logic design, simulation and familiarity with a hardware description language.

SystemVerilog Essentials: Functional Verification and Simulation

1.5 Units

SystemVerilog enhances Verilog in a number of important areas and is becoming increasingly popular in the field of SoC design and verification. It is the new IEEE standard of 1800. This course covers the essential aspects of SystemVerilog, focusing on functional verification and logic simulation.

This course starts with a brief review of IEEE-1364 Verilog language. Students learn the digital simulation process, including compilation, elaboration/linking, and running simulation. VCS is the main simulator used in the course. However, implementation of NC-Verilog and ModelSim will also be covered. Simulation techniques such as coding style, event ordering, delta cycle debugging, zero width glitch, race conditions, time slices and conditional compilation will be discussed. The course also addresses simulation performance and code coverage. SystemVerilog essentials include new data types, interfaces, classes, randomization, and overview of assertions. Examples are given to show how these tools help designers with code compaction and system verifications.

This is a lab-based course with hands-on exercises using the simulation tool and process. It provides an opportunity for designers and verification engineers to acquire essential knowledge and experience before progressing to more advanced courses.

Topics include:

Review of IEEE-1364 Verilog

Simulation techniques and practices

Delta Cycles and event ordering

Simulation performance

SystemVerilog: history and evolution

SystemVerilog: new data types

Interfaces

Classes and randomization

Assertions Overview

Skills Needed: Knowledge of basic logic design and familiarity with a high-level programming language (e.g., Perl or C) and experience using Linux environment.

System Virtualization Fundamentals

2.5 Units

Virtualization is a fundamental technology underlying most modern computer systems and networks, yet little understood by many in industry. Virtualization products are now being applied at the network level, in storage infrastructure, and for virtualized operating systems. They are helping to meet critical IT goals such as cost reduction, productivity, scalability, and cloud computing. This course builds the foundation skills that IT and engineering professionals need to make use of this important technology. The course covers virtualization at various levels. For computer systems, it includes hardware virtualization and support for Hypervisors. For network virtualization, it addresses virtual LANs, virtual SANs, WAN acceleration, network access control, server load balancing and firewall virtualization. In the area of storage virtualization, discussions cover basic concepts and deployment at the device block level, file system level, and more. Licensing issues arising from virtualization are also covered. You will learn the basic concepts of virtualization and how it is applied to CPUs and operating systems, networks, and storage systems.

Topics Include:

History of virtualization

Software virtualization

Hardware virtualization: Hypervisors and CPU support for hypervisors

Network virtualization: Load balancing, WAN acceleration, Firewalls, Network access control

Storage virtualization: File system level, Data block level

Other topics of interest: Licensing and virtualization, Data de-duplication and backups, Disaster recovery

Skills Needed: A basic understanding of storage systems and networking concepts.

Talent Acquisition 101

1.0 Units

Finding good, skilled talent is always a challenge for a company. This challenge is true across all industries and all stages of an organization's development. The solution starts with good, skilled recruiters. This course is a survey of recruiting processes, programs, tactics, strategies, resources and tools. Topics include:

Gain the commitment of hiring managers

Assess and select recruiting resources

Source and recruit technical candidates

Understand how to produce the results expected of top recruiting professionals

TCP/IP Essentials

2.0 Units

TCP/IP has become the primary protocol for connectivity on the Internet and enterprise networks. This course presents an overview of the TCP/IP protocol suite, IP addressing, and subnetting. Participants will also learn about routing concepts, planning and configuring IP address assignment, name-resolution process, and troubleshooting. The course will provide network professionals with essential knowledge needed to apply the skills on the job. It is intended as a fundamental course for students who are interested in network engineering and management, systems administration, network security, and embedded systems certificate programs.

Teaching Beginning ESL Students: Principles and Practices

How do you begin to teach English to a student who is starting from square one? How can students grasp fundamentals without the benefit of translation? Participants in this course learn the basic principles and central guiding hypotheses of the Natural Approach to second-language acquisition. The course focuses on beginning language learners and highlights strategies for creating comprehensible, multimodal language lessons; modifying speech; fostering a low-stress environment; and giving timely feedback.

After reviewing basic exemplary instructional factors, most of the course time will be spent on demonstrations of and participation in practical classroom strategies.

This course is appropriate for teachers in grades K--12, as well as adult education programs.

Teaching Grammar, Level II

2.0 Units

All ESL students, whether they speak other Indo-European languages or languages outside the Indo-European family, bring special grammatical challenges to the learning process. Those challenges require that ESL teachers become fully aware of grammatical detail that we normally don't need to notice. Truly effective ESL teachers must learn new ways to assist students in overcoming these grammatical hurdles. Learning these new teaching patterns is the goal of this course.

Technical Communication: An Introduction to the Profession

1.5 Units

An introduction to the profession for beginners and newcomers, this course will help you determine how your skills fit the field of technical communication. In the first half of the course, you will explore the profession:

Learn about the top 10 indicators of success Take a quick look back at 2,000 years of technical communication Examine the roles of technical communicators today

Through exercises, problem solving, case studies, and lecture, participants discover the roles that technical communicators play in work settings such as Fortune 500 industries, start-ups and government labs, as well as freelance consulting.

In the second half of the workshop, you will explore the process by which technical communicators accomplish their work, including information design and development processes, in particular user-centered processes. Through in-class exercises, discussions, and lectures, participants discover how the work of a technical communicator fits into a product life cycle or research cycle. Broadly experiencing the entire process, you will practice interviewing subject-matter experts and users, define the pieces of an information set, and measure the work. After successfully completing this course, participants should be able to identify key roles, tasks, tools, and career paths for a technical communicator; identify job types, locations, and skills that fit their interests; write parts of typical documentation; describe the way that technical communication fits into the larger organization; list a dozen tasks a technical communicator typically performs; and list the phases of a user-centered-product or information-design-and-development process.

Technical Writers' Workshop

1.0 Units

In this workshop, you'll learn how to improve the style and structure of technical information. You'll work on your own style, and you'll evaluate the style of others. In addition, you'll learn how to spot and organize potential topics when creating tasks, concepts, and reference topics, while improving the overall quality of your own work and the work of your team.

Quality initiatives are common in business and government, and these campaigns have even begun to affect technical communication groups. Managers must now prepare plans for improving and measuring quality and proving that their teams have met or exceeded performance measures.

In this workshop, you'll learn how to use and create several tools for improving the quality of technical information, including:

Style guides

Checklists

Heuristic evaluations

Reviews, tests, and edits

By the end of this course, you will be able to do the following: Speak articulately about style

Distinguish between different concepts of "style"

Define the purpose of a style guide

Describe the process for developing a style guide

List the major components of a style guide

Identify at least half a dozen style guidelines

Develop a personal approach to improving your own style

Recall and apply guidelines for quality Spot the cues that indicate what a passage lacks

List and explain at least half a dozen guidelines for clarity, task orientation, completeness, organization, and retrievability

Write and revise Concept topic

Task topic

Reviews of other writers' work

Menus, lists, headings

Your own quality checklist

Technical Writing Certificate Completion Fee

Once all of the certificate requirements have been met and your final grades are posted, please access your Student Portal to enroll in the "Certificate Completion Fee" to begin the review process. Please allow 4-6 weeks to receive your certificate.

Techniques of Educational Therapy: Affective, Cognitive and Perceptual Elements

3.0 Units

This course explores the fundamental cognitive processes that are necessary for learning to occur at maximum capacity. These include motor, auditory, visual, visual motor integration and verbal processing areas. The course will also include how to increase the functionality of these areas as well as attending skills. The "affect" of learning or how the student feels about himself in terms of academic performance will also be addressed. We review possible scenarios of client experiences and how to support their learning.

Technology Impacts in the Supply Chain

1.5 Units

Supply chain leaders throughout the world agree that technology is advancing more rapidly than ever. This course discusses the technology cycle and how it has impacted the supply chain in recent decades. This includes the use of ERPs for inventory management, procurement, and customer relationship management. In the future, technology will continue to increase efficiency through the use of tools like RFID, warehouse robotics, and even drone delivery. Knowledge of available technology is imperative for supply chain managers.

It is highly recommended that students take "Evolving Role of Supply Chain Manager" as the first course prior to taking this course.

Learning Objectives Discuss the impact of the rapid advancement of technology in the supply chain

Identify various IT systems used throughout the supply chain

Evaluate leading technologies and their potential impact to an organization

Topics Covered Introduction to technology in the supply chain

The technology cycle

Integrating technology into the supply chain

Applied technologies, Internet of Things

Evaluation of emerging technologies

Assessing risks in technology

Technology in the future

Technology in Schools, Introduction (SB 2042 Standard 11)

2.0 Units

This course introduces K-12 teacher candidates to current technologies that enhance the classroom and learning experience. You will learn to leverage new modalities to communicate with students, parents, colleagues, and administration; design technology-integrated instructional activities; gain insight into related legal and ethical issues; and practice with various technologies for instruction and assessment. By the end of the course, you'll have a toolkit of technology resources and strategies to benefit your classroom. This course meets the SB 2042 Level 1 technology requirement (Standard 11) for teacher preparation.

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Terminating and Managing Problem Employees

0.5 Units

Termination of problem employees can lead to lawsuits against an organization. To prevent litigation, human resource professionals must investigate and document the termination process. In this course, participants examine practices that minimize the risk of litigation by problem employees. Topics include pre-hire procedures, steps during employment, and a termination process that ensures "rightful discharge."

Note(s): Professional Credit: MCLE--Minimum Continuing Legal Education State Bar of CA.

TESOL Certificate Completion Fee

Once all of the certificate requirements have been met and your final grades are posted, please access your Student Portal to enroll in the “Certificate Completion Fee” to begin the review process. Please allow 4-6 weeks to receive your certificate.

TESOL Practicum

5.0 Units

This practicum provides an opportunity to apply theory and methodology to the ESL classroom through supervised student teaching. Certificate candidates meet with their instructor for 10 hours, work with a master teacher and teach 25 hours in a classroom setting. Candidates prepare a lesson plan, including teaching objectives, learner outcomes, methodologies, and assessment tools. Observation and feedback sessions with the instructor are arranged individually. Candidates organize a portfolio of their coursework, sample student work, and evidence of professional achievement in the TESOL program. Portfolio review is part of the certificate evaluation.

The Internet of Things: Big Data Processing and Analytics

3.0 Units

How are you harnessing the immense amount of data embedded inside The Internet of Things (IoT)? This phenomenon promises many new technological innovations and business benefits. The prospect of connecting potentially millions or even billions of embedded devices, sensors, appliances and other data-collecting gear to the cloud is daunting yet exciting. It requires new processes and tools for collecting and processing IoT big data and analyzing the device information to glean insights embedded within vast amounts of data. This course introduces the data and analytic flows with a specific focus on IoT. The course first defines IoT and why IoT data processing is very different from typical big data analytics, with its unique requirements for data security, device identity, huge data volume, and real-time processing. The course reviews the challenges and current architectures of IoT data collection to the cloud. Using a hands-on approach in Amazon Web Services (AWS) with simulated data, you will learn to build a messaging and data streaming system with Apache Spark, Storm and Kafka. You will learn to perform a real-time pattern analysis with IoT data, utilizing the Hadoop ecosystem and gaining further predictive insights to set up actionable triggers for business and data mining applications. You will use AWS accounts to work on assignments that let you design and analyze your own IoT device data and explore valuable insights. The course demonstrates data flow and offers hands-on experience gaining business intelligence from IoT big data. The instructor will share industrial practices of IoT big data processing and analytics. The course focuses on how to use tools and provides a basic overview; in-depth of the data processing tools and frameworks are covered in other courses. Some programming will be needed to customize the data flow at the Hbase layer in Spark.

By the end of the course, you will have learned:

The characteristics and requirements of IoT specific data

How to build a data flow to connect an IoT system or device data to the cloud in specific formats

How to use big data tools to process IoT data in distributed computing

How to use machine learning algorithms to analyze IoT data patterns and extract intelligence.

Skills Needed: Software installation and some programming experience in C, Java or Python (one of the three) is required.

The Internet of Things: Sensors, Platforms, Communications, and Applications

3.0 Units

Internet of Things (IoT) is a fast-emerging area in the technology industry today, which has applications in a wide variety of domains including home automation, wearables, personal fitness, smart grid, smart irrigation, and smart parking. The total number of IoT devices is estimated to exceed 20 billion in the next several years. This course is intended for students who want to learn how to design and prototype IoT applications. It focuses on hardware choices, including sensors, actuators, and IoT platforms, the software required to interact with these sensors and actuators, the communication bearers available for moving the data to/from the sensors and the platform and getting it to a cloud platform. Upon completion of the course, one will be able to design and implement a complete end-to-end IoT solution from sensors through getting data into the cloud. The course consists of two parts. In the first part, the course offers an overview of IoT and covers the basics of designing and developing IoT applications, including the building blocks of IoT, characteristics of IoT systems, and IoT design patterns. Sensors, actuators, IoT hardware platforms, and communications capabilities will all be explored. The second part covers how to design and prototype IoT applications with a focus on end-to-end solutions. Taking the knowledge gained in the first part of the course, one will implement several end-to-end solutions, gaining important practical experience.

Topics Include:

Definition and characteristics of IoT

Building blocks of IoT

Domains of IoT applications

Designing IoT systems, including design methodologies, design patterns and case studies

End-point devices in IoT: Sensors, actuators and IO interfaces

Programming with sensors

Popular IoT devices and prototyping platforms

IoT cloud platforms and getting data into them

Note(s): This course is project based and requires the purchase of several sensors and IoT hardware platforms (about $120, not included in the tuition). Detailed board information will be provided at the first class. Students are required to bring laptops to class.

Skills Needed: Knowledge of embedded system hardware and programming experience with C. Some practical electronics or electrical engineering experience is beneficial, but not required.

Timing Closure in IC Design

3.0 Units

As integrated circuit designs such as ASIC, FPGA and SoC become increasingly complex, the timing closure of designs becomes more challenging. It involves all stages of physical design, and even RTL changes. The standard industry practice is to perform a Static Timing Analysis (STA) on the design before signing off to manufacturing. Primetime is one of the most popular EDA tools used for this process. This course begins with the basic timing concepts and STA methodology. It introduces students to setup/hold timing and explains how to fix violations in the design. You will learn what needs to be timed and how to setup a run for STA. The course exposes students to constraints, exceptions and "what if" analysis. It also explains how to address timing violations in ECO mode. Nano-technology topics including noise analysis, prevention and on-chip variations are covered. The instructor shares practical experiences meeting timing closure, budgeting and debugging.

The instructor will provide tool instructions and test cases for practice. Design engineers completing this course will be able to perform Static Timing Analysis using Primetime or any other STA tool in multiple phases of the integrated circuit design process.

Topics include:

Introduction to Static Timing Analysis (STA)

Delay and timing analysis

STA tools and Primetime

Understanding timing closure

Understanding exceptions

Impact of noise in designs

On-chip variations

What's fatal for design and what's not

Skills Needed: Linux/Unix skills are required for lab exercises.

Toxicology Basics for Biotechnology

1.5 Units

High-throughput efforts by biopharmaceutical companies focusing on the discovery and validation of new targets and identifying agents that affect them will uncover a multitude of new chemical and biological agents that have the potential for clinical benefits. However, before such agents can be tested and used widely in patients, safety and acceptable toxicity to critical organs must be demonstrated. This course surveys the adverse effects resulting from the interaction of chemical agents with living systems. Topics include:

Criteria and mechanisms of toxicity

Dose-response relationships

Factors influencing toxic action

Acute and chronic effects

Kinetics

Metabolism

Toxicity testing

Toxic effects of various classes of chemical agents are discussed and illustrated with case studies where applicable. Applications of toxicology to both pharmacology and drug development are discussed. Throughout the course, emphasis is on integrating theoretical and practical aspects of toxicology.

Professional Credit: CA BRN/LVN Credit--Provider #CEP13114.

Toxics Laws Legislative and Regulatory Update

0.5 Units

This one-day workshop covers new and pending changes in environmental health and safety (EHS) legislation, regulations, and judicial developments. A number of EHS policy initiatives have emerged from recent state legislative actions. Notable developments include bills that impact air quality, hazardous materials and hazardous waste, water quality, solid waste, cleanup, green chemistry, climate change, and health and safety. You'll learn about these and other new EHS laws and regulations, as well as their compliance implications. This workshop is intended for EHS professionals and managers in government and industry, as well as attorneys, elected officials, and policy makers. Professional Credit: CSPs, CPEAs, can claim COC points 0.6. MCLE--Minimum Continuing Legal Education State Board of CA--6.0 hours.

Understanding Learning Differences

3.0 Units

This course helps professional educators, counselors, educational therapists, and parents understand learning differences. Current theories on neurological processing, attention and memory are presented. Through case studies, discussion, video and lecture, participants learn to identify the signs of autism, Asperger's Syndrome, nonverbal learning disorder, learning disability and attention deficit disorder, as they relate to learning tasks.

Usability Testing Documentation

1.5 Units

Product development organizations recognize that usability is an important criterion for successful products. To ensure that your products are usable, your organization must incorporate the principles of user-centered design---a process that relies on a deep understanding of and response to the users of your products, including their needs and goals. This introductory course describes the user-centered design process, from analysis through design and validation, with emphasis on where and how usability testing fits into the development cycle. You'll gain hands-on experience planning and designing a usability test to validate documents, and you'll get to conduct your usability tests in small groups. Once your test is complete, you will compile and analyze the test results and present findings and recommendations to the class. Upon completion of the course, you will be able to: Describe the basic concepts, terminology, and goals of quality, usability, audience and audience analysis Plan and conduct at least one analysis for understanding users, including their goals, tasks, and environment Describe the relationship between audience analysis data and design decisions Describe the basic concepts, terminology, goals, and limitations of usability testing Plan and conduct a usability test, compile and analyze the test results, develop recommendations, and report those recommendations

Recommended: "Developing Technical Information from Plan to Completion" or (with instructor's approval) equivalent course work or experience.

User Experience and Web Design Certificate Completion Fee

Once all of the certificate requirements have been met and your final grades are posted, please access your Student Portal to enroll in the “Certificate Completion Fee” to begin the review process. Please allow 4-6 weeks to receive your certificate.

User Experience Design, Advanced

3.0 Units

This follow-up to “User Experience Design Fundamentals” covers new design methods and offers hands-on practice. In addition to understanding the UX design principles and processes at a greater depth, advanced practitioners also have to engage users for research, use tools to communicate design, as well as carry out the design in a collaborative product development environment. If you want to take your design skills to the next level and practice advanced techniques in user experience design, this is the course for you. The course focuses on application of the design methodologies and design strategies, from concept development to prototyping, including user research and design presentations. The goal of this course is to get you ready to take real-world UX design challenges and master industry practices in interaction design, visual design and information design, including DOs and DON’Ts. You will also learn how to apply human cognitive principles in design. The course will expose you to design & prototyping tools to create effective and pleasing user experiences. The course includes techniques for team collaboration, UX design presentation, documentation, and effective codification, as commonly practiced with clients and in corporations.

You will work on individual and team projects while sharpening your UX design skills and knowledge, while receiving feedback from the class. Projects may include websites, software applications, or product interfaces. The course will also provide guidance in establishing a UX design portfolio.

Skills Needed: Students should have completed the prerequisite course, or have at least two years of work experience in the field. In addition, a working knowledge of an image processing and/or drawing application (e.g. Adobe Illustrator, Google Drawings, OmniGraffle, Sketch, or a similar program) is required. The drawing is to communicate product design in high fidelity graphics.

User Experience Design Fundamentals

3.0 Units

User experience design is a major factor in creating winning industry products. Design-driven businesses and products have a higher chance of succeeding in the marketplace. This course focuses on using user-centered design strategies and methods to create highly effective, pleasurable, and usable products while meeting business goals and objectives. The knowledge gained in this course directly applies to creating great user experiences for Web sites, Web applications, software as well as user-interfaces of many other products. The course will also expose you to the multi-disciplinary nature of the user experience design process, design thinking, and the steps you can take to succeed. The course covers methods and strategies of six overlapping phases: problem identification, information collection, idea generation, prototyping, evaluation/testing, and implementation.

You will practice with assignments and through team discussions. Some assignments require high-fidelity design of Web applications.

Skills Needed: "Adobe Illustrator, Introduction" (can be taken concurrently), or access to and experience using a drawing application (e.g. Adobe Illustrator, Fireworks, Google Drawings, OmiGraffle, Sketch, or a similar program). Knowledge of image processing applications such as Adobe Photoshop and ability to draw flowcharts and basic visual elements are highly recommended. The drawing is to communicate product design in high fidelity graphics.

Validating Software for Medical Devices and Emerging Technologies

2.0 Units

With the increasing number of medical devices running on software, there is an enormous demand for quality assurance and regulatory affairs professionals who can address the validation, documentation, compliance and submission requirements unique to software-controlled devices. This how-to course covers the requirements for validation for all types of software, including Class II and III embedded medical device software, digital health apps, software as a medical device, medical device data systems, manufacturing software, automated test software, process software, quality system software, and spreadsheets. Student engage in interactive classroom discussions and an in-depth survey of the regulations, guidance documents and standards specific to medical device software and validation. The course will help students understand FDA, EU and global perspectives on software validation by covering:

General principles of software validation

FDA design controls as applied to medical device software

IEC 62304

Mobile medical applications

Off-the-shelf software use in medical devices

Students work on a project designed to determine software level of concern, define a software validation strategy, write a software validation plan, create software validation test procedures and test cases, and write a software validation report. They learn effective documentation and the regulatory requirements and expectations for software used in the medical device industry.

Value-Added Quality Audits

1.5 Units

In today's dynamic business environment, every aspect of an organization needs to perform value-added activities that have a positive impact on the bottom line. Regulatory and quality units in more and more biomedical industry corporations are relying on quality audits as a means to improve operations. By auditing to domestic and international quality system regulations (GXP, QSR and ISO), these organizations are assessing and improving the effectiveness of their internal systems and those of their suppliers and corporate partners. This hands-on course introduces participants to fundamental auditing principles and techniques including planning, conducting, analyzing, and communicating audit results in terms that are meaningful to senior managers. By understanding the psychology of audits and practicing questioning techniques, participants will take their organization's quality audit program to another level.

Viruses, Vaccines and Gene Therapy

1.5 Units

The recent outbreaks of Zika and Ebola viruses and an increase in the rates of certain viral infections reflect the profound impact viruses have on human health worldwide. Students in the course study past viral pandemics—influenza, smallpox, and polio—and how they have altered human history. They survey how viruses replicate in human hosts and spread in human populations. Students also learn how recent developments in molecular biology and genetics have been instrumental to the biopharmaceutical industry in developing antiviral drugs and viral vaccines. Consider how viruses cause disease (pathogenesis), the relationship between viruses and cancer, host defense mechanisms, and the influence of climate change on emerging viral diseases. Join in the discussion of the role of viruses in transferring genes to individuals undergoing gene therapy, and the promise of new gene therapy technologies using CRISPR-Cas 9 and a chimeric antigen receptor CAR-T cell therapy, which the U.S. Food and Drug Administration commissioner recently described as "another milestone in the development of a whole new scientific paradigm for the treatment of serious diseases." Based on practical case studies, you'll explore the interplay of viruses with their cellular hosts. Building on this foundation, you'll examine the salient issues associated with viral vaccines, using viruses as the vectors for gene therapy, and therapeutic viruses. Discussions cover antiviral drug development and the problem of drug resistance as well

as effectively using antiviral drugs to treat viral disease You'll learn about virus evolution, emerging viruses, the risks and benefits of viral vaccines, the polio eradication campaign, the epidemiology of influenza virus, the progress toward developing an HIV-1 vaccine, and the challenges associated with gene therapy.

Course evaluation consists of a take-home exam and an independent writing assignment on a virus of the student's choice. Some knowledge of molecular biology is desirable, although a desire to appreciate the significance of viruses in real-world settings is sufficient. This course will benefit individuals preparing for career advancement in both clinical and industry roles.

Professional Credit: CA BRN/LVN Credit--Provider #CEP13114.

Visual Design for the Interactive Web

2.5 Units

With technology finally catching up with the quality of visual design seen in print, businesses are demanding that visual designers understand how to produce professional-quality interactive designs that excite users and enhance their brand. In this course, you'll learn what this means and how to do it within the context of today's development environment including designing for responsive design (or design for multiple form factors, such as a smartphone, tablet, laptop or large screen). In this course, following a standard user-centered design process, you'll redesign a website, exploring multiple visual design concepts that are critiqued in the class. Through this process and several in-class exercises, you'll learn the fundamentals of visual design including typography, color theory, layout, iconography, brand identity design, and creating a visual design language for interactive media. The course also teaches you the language of design, its purpose, and how to sell a design concept. You'll finish the course with a portfolio piece

The course will benefit print graphic designers who want to apply their skills to the Web, web professionals who want to improve their basic design skills, product managers, and software engineers who work with visual designers, and anyone interested in learning how to create professional-looking interactive designs.

Topics include:

Visual communication using color, typography, layout, and imagery

Communicating the brand

Creating a visual design language

Designing the best, most engaging and interactive user experience

Presenting and selling your design concepts and ideas

Skills Needed: "Adobe Photoshop, Introduction" or equivalent experience is required. “Adobe Illustrator, Introduction" and "User Experience Design Fundamentals" are recommended."

VLSI Engineering Certificate Completion Fee

Once all of the certificate requirements have been met and your final grades are posted, please access your Student Portal to enroll in the “Certificate Completion Fee” to begin the review process. Please allow 4-6 weeks to receive your certificate.

Web and Mobile Analytics

1.5 Units

With the explosive growth of online business transactions, Web and mobile analytics play an important role in understanding and optimizing customer reach and growth. Unlike off-line business models, to compete in the digital global economy, organizations need to employ agile digital marketing techniques that can continuously adapt to customer needs. This is a hands-on class full of real-life examples to work through. In this class students will learn how to:

Define metrics that help capture customer experience in Web and mobile environments

Learn how to work with big customer profiling data using cutting edge machine learning turn-key solutions (R packages, Python libraries - no programming needed)

Use tools such as Google Analytics, Tableau, Gephi, and others to derive patterns and predict possible outcomes

Create reports and infographics that help understand micro and macro levers that can be used to iteratively improve your marketing campaign

Web Application Development Using React, Redux and TypeScript

2.0 Units

As Web and mobile applications become ever more complex in data and user interactions, this causes more challenges in developer productivity and code quality. To address such concerns, Facebook introduced and released two recent innovations, React and Flux, which have been adopted by an increasing number of Web developers. React is a UI engine that builds composable rich user interfaces from smaller components. It uses an asynchronous data approach and in-memory Document Object Model (DOM) to make UI rendering fast and efficient. Flux is an architectural pattern to build scalable Web apps that complement React. Given the problems of bidirectional data flow, Flux architecture is introduced to enforce one-way data flow among its four entities: actions, dispatchers, stores, and views. It employs one-way data flow to simplify application complexity. And Redux is the most popular and the simplest framework that implements Flux architectural pattern. TypeScript is a superset of JavaScript that makes JavaScript scalable. It adds static typing and class-based OOP to JavaScript. TypeScript makes the potential bugs introduced in the code easy to location through compiling errors and dramatically facilitates code refactoring and code debugging. This course covers React, Flux, Redux and TypeScript in detail for developing highly interactive Web apps in robust and scalable ways. The course provides a brief overview of the MEAN stack, focusing on the novel way React uses virtual DOM to do selective updates, as well as React's approach to handling state changes and events of its components. You will learn to create components, build complex components, update and mount to DOM, and learn to test React applications with Jest. You will learn to handle complex user interactions and to communicate with the server using RESTful API in Flux/Redux applications. You'll learn through examples that show how this approach allows you to add new functionalities without exploding the complexity.

You will be expected to do a significant amount of coding in class. Comprehensive familiarity with JavaScript and AJAX is required. In addition to weekly assignments, you will practice the principles

and techniques learned in class through a final development project. Students are required to bring laptops to class.

Course Objectives:

At the conclusion of the course, participants should be able to:

Implement interactive web applications using React.js

Understand prop and state and the one-way data flow from between components

Implement complicated interactive web applications with the backend support using React.js and Redux

Implement scalable web applications using TypeScript

Prerequisite(s): Students should have programming experience with client-side JavaScript, AJAX, and basic understanding of HTML and CSS.

Web Applications Testing, Comprehensive

3.0 Units

The proliferation of Web-based applications presents challenges for testing and quality. Distributed software architecture, diverse and dynamic execution environments (OSes, browsers, networks, run-time code generation), multiple programming languages or models, and a large user base all make Web testing more complex. Even non-Web-based apps today typically use Web services behind the scene, ranging from simple software updates to a “desktop shell” that hosts Web applications. These apps also require Web testing. This course provides the essential knowledge and skills needed to test Web apps and services. It covers Web testing from end to end but with more focus on the client-side testing. The course begins with an introduction to Web architecture and the basic protocols for Web services. Using an example of a feature in a large Web application, you will learn to develop a test plan and test cases that can be executed automatically. The course covers three aspects of Web testing: UI, Web services, and load/performance. The Selenium tool is used to interact with browsers and to automate UI testing. The concepts of hermetic versus deterministic testing will be explained. You will learn to use Selenium design patterns to manage large numbers of automated tests. The course covers the use of Java or JavaScript in WebDriver tests and how to perform unit level, functional and behavioral tests as well as test coverage, with common testing tools used in the trade. The course also covers setting up test environments, using open source tools for testing the performance of Web applications.

The course employs open source tools to practice the various aspects of Web testing. Students are required to bring laptops to class and install tools on their own computers. Java programming experience is strongly recommended. JavaScript knowledge is also recommended and Python can be used as an option. Students should also understand basic testing terminologies, as they will not be reviewed in this course. The techniques learned in class can be useful for Web interface automation even though this is not the focus of the course.

Topics Include:

Introduction to Web protocols and testing

Test planning

Test automation with Selenium

Selenium design patterns

Testing JavaScript - unit, functional, behavioral

Test coverage

Testing Web services

Web performance measurements

Web Framework Using JavaScript: The MEAN Stack

3.0 Units

JavaScript is the standard for client-side scripting today. Its features and performance have been improved significantly over the years to enable the use on the server-side. The MEAN stack (MongoDB, ExpressJS, AngularJS, and Node.js) is an emerging Web framework that uses JavaScript and is designed to build Web applications from front to back. It uses a single language to offer development productivity and efficiency. The inclusion of these components represents a breakthrough in event-driven and asynchronous architecture, producing the optimal user experience. This course is an introduction to the popular open-sourced Web framework. The MEAN stack consists of client, server and database skills. The course explains the four components and the role each has in building a modern, sophisticated Web application, and then covers the configuration, implementation and programming details. You will learn to build the Node.js server, include Express in the app, interface with the document-oriented database MongoDB, and use Angular directives and services on the client side. The course will also discuss the interactions with JSON, Model-View-Controller, Web services and HTML in this framework. Class assignments and projects will give you hands-on experience.

Prior to enrolling, students should be familiar with JavaScript and understand database, Web services and client-server needs. The course covers only the essential parts of the MEAN stack. Students are encouraged to bring laptops to class. The instructor will provide software installation guides.

Topics Include:

Introduction to the MEAN stack

Building the Node.js server

Interacting with MongoDB using Mongoose

Configuring and using Express in a Web app

Implementing Express in Node.js

Understanding AngularJS directives

Implementing AngularJS services

Connecting MongoDB and Node.js

Accessing and manipulating databases

Website Hosting and Optimization, Introduction

1.0 Units

Formerly “Managing Website Development and Deployment”

This course covers the decision points and practical challenges of launching and administering a website, such as choosing a domain name and Web hosting platform. You will review and evaluate some popular e-commerce and content management systems, and learn the hands-on skills necessary to administer domains, monitor website performance with analytics, and get sites and pages listed by search engines. The course first discusses the technical requirements for a website project and outlines how these requirements affect design, as well as development and hosting solutions. You will learn about the range of Internet hosting services, the variety of server operating systems, and criteria for evaluating content management, e-commerce, and Web analytics systems. The course includes hands-on exercises that use website administrative control panels, content management and e-commerce software, ftp user administration, permission configuration, and password-protecting directories. Your hands-on assignments will utilize open-source solutions based on the Apache Web server platform. The course also discusses search engine optimization.

The course is for students interested in working as website administrators, whether as independent Web professionals or as employees responsible for an organizational website.

Topics include:

Goal setting: Identifying specific, measurable goals for site performance

Choosing a Web hosting service and server type

Evaluating popular content management systems

Review of e-commerce solutions and shopping cart systems

Search engine optimization basics

Site analytics: Monitoring traffic and site performance

Performance optimization basics

Note(s): Students will be required to purchase a domain name and sign up for a low-cost cloud hosting service for use in the course. Students will also be required to obtain free accounts at Google Webmaster Central and Google Analytics.

Web Technologies, Introduction

1.0 Units

The technologies involved in website development and maintenance can be an alphabet soup of acronyms, codenames, and abbreviations, making it hard to understand what they are, how they work and how they interact to develop Web page design and functionality. Web technologies are constantly being developed and improved, making it difficult for Web professionals to understand what is available, determine which technology to use to achieve the desired result, and communicate project requirements to decision-makers, programmers and site administrators. This course provides a basic overview and understanding of many key Web technologies without delving

into programming. It starts with Internet fundamentals, such as HTML, Cascading Style Sheets (CSS), and Extensible Markup Language (XML), and describes how scripting, such as JavaScript, jQuery, and AJAX, works in dynamic websites. The course also discusses server technologies, Web and application servers, Hypertext Preprocessor (PHP) and content management systems. It also provides insight into Internet security, e-commerce, databases, social networking, mobile device Web design, and cloud computing.

The course does not offer programming or site configuration training, but it will give you enough knowledge to work with developers, designers, site administrators, and marketing professionals effectively. You will learn the basic capability of each technical area.

Topics include:

Internet fundamentals

CSS, scripting, and interactive Web pages

Web and application servers, PHP, content management systems

Rich Internet Applications and multimedia

E-Commerce, databases, Internet security, cloud computing

Skills Needed: Interest in understanding how the Web works, experience using the Web and browsers, basic knowledge of HTML. Web and Interactive Media Design Certificate students should first take “20816 HTML Fundamentals”

Wireless Communications and Mobile Antenna Design, Introduction

3.0 Units

Today over half of all network traffic is wireless. In addition to telecommunication, wireless dominates in computing, industrial and IoT applications. This course presents a fundamental approach to understanding wireless communications and standards, in particular 5G. It also covers antenna and transceiver design principles and practices in mobile devices.

The course briefly reviews amplitude modulation (AM) and frequency modulation (FM), which are essential in understanding IQ modulation used in virtually all modern radios (WiFi, OFDM, CDMA, TDMA, 4g, 5g, etc.). Building on these fundamentals, the course examines the industry’s digital wireless standards, including but not limited to IS-136, IS-95, Bluetooth, 4G, 5G, 802.11(a, g, n), and long term evolution (LTE).

It is equally important to understand antennas in any radio system. You will learn about trade-off considerations of antennas for cellphones, Bluetooth, and WiFi. The course discusses trade-offs of antenna size versus range on various configurations, including dipoles, dish, beams, phase arrays, and slotted antennas. The course will cover practical designs used in the Apple iPhone and Samsung Galaxy and analyze these designs. Instruction emphasizes an intuitive understanding of the fundamentals, rather than complex mathematics.

Topics include:

Radio architectures: Single conversion, dual conversion, and IQ

Modulation: AM, FM, SSB, and IQ (TDMA, CDMA, OFDM, QPSK)

Digital wireless standards: IS-136, IS-95, 3G, 4G, 802.11, and long term evolution (LTE)

Antennas and propagation

Skills Needed: A general background in electrical engineering and networking.

Workplace Investigations

0.5 Units

This fast-paced workshop covers the process and tools necessary to complete a workplace investigation. Legal implications and practical recommendations for conducting pre-employment background investigations are reviewed. Topics include workplace-violence, substance-abuse and intoxication, harassment, computer and other white-collar crimes, and employee theft. Risks and liabilities associated with inadequate or unlawful investigations, failing to investigate and the use of outside investigators will be analyzed. Interviewing, investigation techniques and documentation of the facts learned during the investigation are covered.

The workshop includes brainstorming sessions and other group exercises to develop practical recommendations every HR professional can use when conducting investigations.

Note(s): Professional Credit: HRCI--PHR, SPHR and GPHR strategic recertification credit, 6.5 hours, MCLE--Minimum Continuing Legal Education State Board of CA, 6.0 hours.

Writing Successful Instructions, Procedures and Policies

1.5 Units

When your team is doing iterative development, you may be called on to describe the vision, document the requirements in use cases, and write test cases to determine whether the product really meets the user's needs. You're focusing on what the stakeholder should be able to do concrete actions, described from the point of view of a real user. And when you document the final product in a user guide or help system, your procedures are key. You have to be alert to the doubts, uncertainties, and inarticulate needs of the user, from moment to moment. You have to rewrite and test and revise again, to produce step-by-step instructions that users can really follow.

Of course, if you come to the attention of the boss, you may be asked to write up corporate policies, and their accompanying procedures. You'll probably get conflicting pressures from the executives and the lawyers, and you may be the only representative of the employees who must carry out these policies, so your prose must cut through the bureaucratic fog. Your steps must be clear enough to follow, while acknowledging the messages coming from the board room. Now that takes some fancy footwork!

In all these areas, there are some fundamental principles that will help you help your readers. In this online course, we'll focus on writing in each of these contexts. Each week, you'll download some lecture notes, join a discussion with other students, take a quiz, and write in one of these procedural genres.

By the end of this course, you will be able to:

Understand the role of the writer in eliciting software requirements, supporting iterative development, and doing user testing

Create a vision statement and use-case model

Create scenarios, fully realized use cases, and activity diagrams

Create test cases to ensure that the code does what users expect

Create step-by-step instructions suitable for user guides or help systems

Write policies, requirements, processes, and procedures for corporate governance

For Online Sections of this course: Online courses are largely self-study with instructor support through threaded discussion groups, email and sometimes scheduled online chats. Some instructors may allow students to pace themselves following the published syllabus, enabling them to accelerate through the material and finish early. However, all students must complete and submit all assignments by the schedule end date. Grades are issued for the entire class approximately two weeks after the scheduled end date.

XML Essentials

2.0 Units

Extensible Markup Language (XML) is used for creating Web pages and is the standard format for electronic documents. It is also widely used to represent data structures on the Internet. This course gives students a broad understanding of the power of XML and its use in real-world applications. The course begins with the history and background of XML and the advantages of moving toward the XML standard. The course introduces basic tags as well as syntax rules for XML and XML environments. Practical examples will be used to demonstrate the basics of working with XML, cascading style sheets and document-type definitions. The course briefly addresses the concept of Document Object Model (DOM) and the data manipulation capability. Throughout the course, there will be exercises to help students learn key concepts. At the completion of this course, students have an understanding of XML, where to apply it and the associated technologies that enable enterprises to utilize the Web's full potential.

Topics include:

Overview: creating and validating XML data

How to format and render an XML document

Cascading Style Sheets for XML documents

XSL and XSLT introduction

Real world use of XML

Skills Needed: Web page creation skills and a basic understanding of cascading style sheets.