COURSES START WEEKLY **ENGINEERING & TECHNOLOGY** BIOSCIENCES • EDUCATION • BUSINESS & MANAGEMENT



#### **BIOSCIENCES**

#### NOTICE

HAZWOPER —
is now located in the Bioscience section

# ENGINEERING AND TECHNOLOGY

UPDATED CERTIFICATE PROGRAM
User Experience and Web Design

#### **EDUCATION**

#### SPECIAL OFFERING

Introduction to the Common Core State Standards (K-12): What Counts as Common Core?

#### **UPDATES**

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All content correct at time of printing but subject to change, please check website.



# You're Invited

Join us for free info sessions hosted by staff to learn about our professional education programs. Reserve your seat today.

#### MAY

#### 22 MONDAY

BIOSCIENCES PROGRAMS

#### **JUNE**

- **5** MONDAY
  - SOFTWARE DEVELOPMENT PROGRAMS
- **6** TUESDAY
  - INFORMATION TECHNOLOGY AND DATABASE AND DATA ANALYTICS

#### 7 WEDNESDAY

- EMBEDDED SYSTEMS AND VLSI ENGINEERING PROGRAMS
- USER EXPERIENCE AND WEB DESIGN

#### **AUGUST**

- 22 TUESDAY
  - EMBEDDED SYSTEMS AND VLSI ENGINEERING PROGRAMS
- 23 WEDNESDAY
  - EARLY CHILDHOOD EDUCATION
  - **EDUCATIONAL THERAPY**
  - INSTRUCTIONAL DESIGN AND DELIVERY
  - TESOL

- SOFTWARE DEVELOPMENT PROGRAMS
- USER EXPERIENCE AND WEB DESIGN

#### **24** THURSDAY

 INFORMATION TECHNOLOGY AND DATABASE AND DATA ANALYTICS

Learn about our programs, network with working professionals and gain valuable insight from experts in your field.

Reserve a seat at ucsc-extension.edu/events.



Dean Lynda M. Rogers, Ed.D.

#### **UCSC SILICON VALLEY EXTENSION**

3175 Bowers Avenue Santa Clara, CA 95054-3225

#### **CONTACT NUMBER**

408.861.3700 Main Line:

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# UC SANTA CRUZ SILICON VALLEY CAMPUS Silicon Valley extension

### Take a look around you.

In Silicon Valley, one simply has to walk out the door to encounter a wealth of diversity. The Bay area is alive with various cultures, nationalities, and religions, all coming together to form the colorful quilt that is Silicon Valley.

Now, take a look around the table at your next board meeting. Is the same still true?

While we have come a long way in terms of diversity, the homogeny present in the upper level positions of Silicon Valley serves to show how far we have to go.

We want a seat at the table.

The problem isn't a lack of viable talent. In fact, the number of STEM graduates from underrepresented minority groups has increased considerably over the past few years in California alone. The problem is the glass ceiling that seems to exist for individuals outside of a certain demographic. Statistics show that minorities and women are woefully underrepresented in Silicon Valley, especially in managerial and executive roles. While the workplace itself becomes more and more diverse, that diversity seems to stop with upper level management.

At UCSC Extension, we believe you should be reflected in every area of the workplace, especially the boardroom. Here you will find the skills necessary not only to excel, but to lead in whatever career path you choose. Want to learn how to create and build out the next big app? We've got you covered. Interested in learning how to rise through the ranks and become an executive at your own company? We've got you covered there too.

Our doors are open to any and all individuals who want to find a seat at the table. Enrolling here couldn't be easier—there is no application or admissions process, but make no mistake; students can expect the same academic rigor that is synonymous with the University of California name.

Here, you'll find an environment conducive to safety and scholarship.

Here, you'll gain the skills to find your seat at the table.

Sincerely,

Lynda M. Rogers, Ed.D. Dean, UCSC Silicon Valley

Lynda M. Rogers











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# Areas of Study

#### CERTIFICATE PROGRAMS

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### Continuing Professional Education for Licensing, Credentials, Certification

Many courses at UCSC Silicon Valley Extension offer credit and/or continuing education units that apply toward professional licensing, relicensing or accreditation, professional teaching credentials and credential renewals, or prepare you for a certification exam.

To locate courses that apply to your professional field, please consult the list below.

### **ACCOUNTING** CPA Preparation......26 BOOKKEEPING Certified Bookkeeper Program......29 **BUSINESS** Human Resource Professionals......32 Paralegals ......35 Project Management Professionals......39 **BIOSCIENCES** Clinical Research Professionals......16 Regulatory Affairs Professionals......20 Nurses ......14 **EDUCATION** Educator Credential Courses ......45 **ENVIRONMENTAL HEALTH & SAFETY** HAZWOPER ......21 **ENGINEERING & TECHNOLOGY** LEGAL STUDIES—CERTIFICATE OF COMPLETION Paralegal—Core ......35 Paralegal—Advanced ......35 Minimum Continuing Legal Credit (MCLE)......38

# Welcome to UCSC Silicon Valley Extension

#### Accreditation

As part of the University of California, Santa Cruz, UCSC Silicon Valley Extension is certified by the Accrediting Commission for Senior Colleges and Universities of the Western Association of Schools and Colleges (WASC).

### Mission Statement

#### UCSC SILICON VALLEY EXTENSION

combines the academic excellence of the University of California with the expertise of seasoned practitioners to provide advanced professional training that addresses the real-world needs of people who work and live in Silicon Valley.

#### Goal

#### YOUR SUCCESS IS OUR SUCCESS

We want to make your path to career success as smooth as possible. Our courses are designed to help you discover the skills necessary to navigate a career transition, a job promotion or a change in field.





### By opening this catalog, you've taken the first step toward advancing your career.

#### About Us

UCSC Silicon Valley Extension focuses on providing professional education stewarded by Program Chairs in the following departments:

# BIOSCIENCES BUSINESS & MANAGEMENT EDUCATION ENGINEERING & TECHNOLOGY

#### THE VALUE OF A UC CERTIFICATE

UCSC Extension's professional courses, and subsequent certificate programs, were crafted to support the business needs and interests of lifelong learners located in the heart of Silicon Valley. Developed with guidance from key industry leaders and academic experts, these programs present University of California-approved curricula that address the specific requirements of the discipline. Programs take a practical approach, and are structured to accommodate working professionals. When studying with us, you'll interact with students and instructors who work in some of the region's top companies. Thousands of Silicon Valley professionals have studied with us and gone on to successful careers.

We make it easy for residents all over the South Bay to continue their education. The majority of our courses are offered during the evening hours and on weekends. Once enrolled Extension students can choose to study in a few different ways:

- in state-of-the-art labs and classrooms at our Santa Clara location;
- online, via our dynamic learning platform;
- and in hybrid courses, which offer a combination of classroom meetings and online learning.

#### AMENITIES

Take advantage of our computer labs, student lounges, wifi access and free tea and coffee. Our facility is conveniently located off Highway 101, just south of Great America and Levi's Stadium, in Santa Clara. We are located opposite Santa Clara Square, which offers new establishments that make time spent with us on site all the more enjoyable.

#### About You

#### **ELIGIBILITY**

Our courses are offered as open enrollment; open to everyone and no application is required. Though prerequisites vary by department, you need not be a UC Santa Cruz student to enroll.

#### CONCURRENT ENROLLMENT

In addition to professional development courses, UCSC Extension supports concurrent enrollment students (also referred to as Open Campus). You can take classes to fit your time and needs. See page 95 for full details.

#### INTERNATIONAL STUDENTS

International students will be interested in our visa approved programs and internship opportunities. See page 96 for full details that fit your needs.

#### FINANCE

*Pay-as-you-go:* You may pay for courses one at a time. No upfront investment is required.

#### What to ask yourself before enrolling:

- i. Am I interested in enrolling in a specific course or pursuing a certificate?
- ii. Which courses work best with my schedule?
- iii. What delivery mode is available?
  - CLASSROOM
  - ONLINE
  - HYBRID: MIX OF CLASSROOM AND ONLINE
- iv. Do I meet the minimum requirements or prerequisites for this course or program?
  - Program and course requirements vary.
- v. Do I qualify for course exemptions or transfer credit?
- vi. Am I ready to **Declare Candidacy** in a certificate?
- vii. How would I like to purchase a course?
  - Do I qualify for retraining assistance or federal aid?

#### Where To Start:

It is easy to enroll online, in person, or over the phone. Please note that some courses have prerequisites that provide a foundation for a complete learning experience.

If you are seeking a more comprehensive educational experience, explore our certificate programs. Certificates are composed of UC-approved courses organized by departments in specific disciplines. In order to earn a certificate, you must earn a cumulative grade point averages of 3.0 or higher.

# You enrolled in a course. Now what?

- i. Have I gotten my textbooks?
   See page 100 to learn about our Amazon partnership.
- ii. Have I accessed or downloaded my course materials? You may access your course materials starting 24 hours before your course begins.
- iii. Am I familiar with the grade policy?
- iv. Am I interested in transferring credit from another institution?
- v. What happens if I need to drop a class or seek a refund?
- vi. What is the UCSC Code of Conduct?
- vii. What are the UC policies?

Simply turn the page and begin...

"The function of education is to teach one to think intensively and to think critically. Intelligence plus character—that is the goal of true education."

DR. MARTIN LUTHER KING, JR.

Morehouse College Student Paper, The Maroon Tiger, in 1947 http://www.drmartinlutherkingjr.com/thepurposeofeducation.htm





# Quick Guide



#### What to consider:

Research classes and interests.

Are you looking at:

(A) individual courses

or

**(B)** pursuing a certificate



Review schedules: Specific dates and times are online.



Review prerequisites: Knowledge base or required courses.



#### How our system works to your benefit:

**Declare candidacy** in a certificate.



#### Enroll:

**Pay-as-you-go;** Pay only for the courses you enroll in that fit your schedule.

• Enrollment confirmation is sent via email.



Once you've enrolled:

24-hours before your course begins, access your course materials.

NOTE: Full details are found in the General Information & Academic Policy section which starts on page 90.





**Online:** Visit our website at ucsc-extension.edu.

**Credit Card:** We accept the following major credit cards: Visa, MasterCard, American Express and Discover.

By Phone: Call (408) 861-3700.



LOCATE US:

3175 Bowers Avenue Santa Clara, CA 95054 Driveway entry is on Scott Blvd.

# CONTACT US:

-PROGRAM OUTREACH

new students extensionprogram@ucsc.edu 408.861.3860 general **inquiries** 408.861.3700

SERVICE CENTER HOURS\*
M-F 8 am-9:30 pm
Saturday 8 am-5 pm

feedback & comments extensionfeedback@ucsc.edu

#### -STUDENT SERVICES

current students extensionservices@ucsc.edu 408.450.4920 grades.....extension**grades@ucsc.edu** 

drops (deadline restrictions apply) extensiondrops@ucsc.edu
FORMS: ucsc-extension.edu/drops

### transcripts

extensiontranscripts@ucsc.edu

FORMS: ucsc-extension.edu/student-services/transcript-info

-ONLINE SERVICES

online students extensiononline@ucsc.edu 408.861.3832

-INTERNATIONAL DEPARTMENT

international students extensioninternational@ucsc.edu 408.450.4945

M-F: Appointments are recommended for meeting with staff\*.

Ray Porras International Student Advisor

Kathy Harrington International Student Advisor, OPT Specialist

Diane Johansen

International Student Advisor, Internship Coordinator Michael Mrache

international, WDB

<sup>\*</sup>Business days are 8 am-5 pm, Monday through Friday, not including holidays. Administrative staff availability is best between 8:30 am-4:30 pm. Service Center support is available throughout the day and while classes are running. The Service Center is located in the corridor next to reception.

# DISCOVER

# Biosciences

#### WHAT STUDENTS SAY:

"I didn't want to to miss out on any courses.



### BHAVNA DIXIT

#### Biotechnology Student

Bhavna Dixit worked as a biotechnology research scholar in India before moving to California in 2015. Armed with a master's degree in biotechnology and work experience abroad, she started researching programs that could prepare her to work in the Bay Area. She enrolled in UCSC Extension's Biotechnology certificate program and within nine months had completed her course work and an internship, and had been hired as a research technician in Silicon Valley.

#### **Courses Reflect Industry Needs**

"I was excited to see that UCSC Extension offers 'Next Generation DNA Sequencing: Methods and Applications,' because there aren't many programs in the Bay Area that cover that topic," she says. "When I was interviewing for jobs, I discovered that many recruiters seek candidates who are familiar with NGS. I also liked the 'Molecular Diagnostics' course, because I had no experience in that area, and was eager to learn new skills."

She was able to use her new skills at her internship, where she did molecular research related to gene therapies for age-related diseases.

"In our diagnostics course, we had to design a practical experiment for a fictional company—we even had to design a kit for a particular diagnostic," she says. "This helped me understand the tactical challenges that companies face, and it was really helpful."

#### **Practical Applications**

"In the 'Drug Development' course, our instructor taught us about the various challenges scientists have when bringing a drug to market and shared his real-life experiences in industry," she says. "No book can teach you that. The program covered everything."

Tell Us Your Story

We'd love to hear how you applied new skills in the workplace, or how your new credentials led to exciting job opportunities. Share your latest achievements by submitting your Extension story to extensionfeedback@ucsc.edu.

# **Bioinformatics**

#### CERTIFICATE PROGRAM

## **Bioinformatics**

#### PROGRAM SUMMARY

Biological data continue to accumulate at a phenomenal rate. UCSC Extension's Bioinformatics Certificate Program was created in consultation with industry leaders to meet the need for biologists and computer scientists with the ability to analyze and interpret this deluge of biological information. Courses in this program are taught by experienced molecular biologists and bioinformatics professionals who bring real-world perspectives and cutting-edge technologies into their classrooms.

The Bioinformatics Certificate provides theoretical foundations and practical skills in bioinformatics. The required courses provide the necessary computational and scientific foundations. A range of electives allows individuals to tailor their studies to their particular needs and interests. Life scientists learn how to effectively use the tools and methods of bioinformatics to enhance their work, while computer scientists gain a background in molecular biology and important bioinformatics methods and tools

This program is designed for students who have a degree in biology, biochemistry or computer science who want to enrich their careers by learning and applying the key principles and practices of bioinformatics.

#### CERTIFICATE REQUIREMENTS

To satisfy the requirements for the Certificate in Bioinformatics, you must complete **three required courses** and **7 units of electives**, for a minimum total of **16 units**. For GPA requirements and program time limits, see page 90.

To pursue two bioscience-related certificates in parallel or in sequence, see page 13.

#### PREREQUISITES

Familiarity with the principles of modern molecular biology is required. Completion of "Molecular Biology, Introduction" or an equivalent course within the last five years, or equivalent experience satisfies this requirement. An understanding of probability and statistics is required for "Statistical Analysis and Modeling for Bioinformatics and Biomedical Applications." Students without this background should first complete "Statistics" or the equivalent prior to taking "Statistical Analysis and Modeling for Bioinformatics and Biomedical Applications."

#### RECOMMENDED COURSE SEQUENCE

Those new to the field of bioinformatics should start with "Bioinformatics Tools, Databases and Methods" and/or "Experimental Methods in Molecular Biology" (after completing the prerequisites). Courses may then be taken in any sequence unless otherwise specified in the individual course description.

### PROGRAM CHAIR Bioinformatics and Biotechnology



EDWARD ROZHON, Ph.D, has a long and distinguished career as a contributor to the development of drugs for viral and bacterial diseases, autoimmune diseases, and cancer. Dr. Rozhon recently retired from Genentech where he was a senior manager of clinical trials for autoimmune, infectious and ophthalmologic diseases. He worked at Schering-Plough and Roche. Dr. Rozhon completed his Ph.D. at Indiana University and pursued post-doctoral training in neurovirology at the University of Alabama School of Medicine and at Northwestern University School of Medicine, where he was subsequently appointed as faculty. He has taught courses in drug development and virology at UCSC Extension for 16 years.



# INFO

#### Biosciences Programs



discussion geared towards new or returning students interested in one or more of the Bioscience certificate programs—Biotechnology, Bioinformatics, Clinical Trials Design and Management, Regulatory Affairs, and Medical Devices. The event begins with a short overview of the five Bioscience certificates, followed by an open-floor segment for audience questions.

#### CLASSROOM

Monday | 6:30—8 pm | May 22 No fee, but enrollment required.

**Section Number 22402.(017)** 

#### BIOSCIENCES

### IN THIS SECTION

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<b>▶</b> Bioinformatics	11
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▶ Clinical Trials Design and Management	16
► HAZWOPER	21
Medical Devices	18
▶ Regulatory Affairs	20

### Prerequisite Courses

#### **Statistics**

AMS.X400.102 (5.0 quarter 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.

ROBERT KNIGHT, M.S., D.P.M.

ONLINE | June 16-September 28 Enrollment accepted through August 25 Fee: \$860.

Section Number AMS.X400.102.(800)

### Required Courses

#### **Bioinformatics Tools, Databases** and Methods

CMPS.X446.4 (3.0 quarter units)

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 algorithm development and advanced computational methods. You'll learn through computer lab exercises and online demonstrations of databases and Web-based tools. This is the recommended first course for those wanting to gain bioinformatics skills.

Prerequisite(s): "Molecular Biology, Introduction."

JANANI RANGARAJAN, M.S.

ONLINE | June 16-September 28 Enrollment accepted through August 25

Section Number CMPS.X446.4.(800)



#### **BIOINFORMATICS CERTIFICATE**

16-unit minimum		
PREREQUISITE COURSES		Units
Molecular Biology, Introduction		3.0
AND Statistics	1868	5.0
REQUIRED COURSES (3)		Units
Bioinformatics Tools, Databases an Experimental Methods in Molecula Statistical Analysis and Modeling f		3.0 3.0 3.0

ELECTIVE COURSES (7 units required)	Units
Take required courses before electives.	
DNA Microarrays: Principles, Applications and Data Analysis	3.0
Drug Discovery, Introduction	
Gene Expression and Pathways	
Genomics and Next Generation DNA Sequencing: Methods and Applications	3.0

Any one course from UCSC Extension's Biotechnology Certificate may be applied toward the elective unit requirement for the Bioinformatics Certificate Program.

Certificate schedule outline of program curriculum and annual schedule are found online. From the homepage, select: "Area of Study"; department; then certificate title as listed above.

#### **Experimental Methods** in Molecular Biology

NATSC.X446.5 (3.0 quarter units)

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; and the fundamentals of experimental design. You'll also learn about high-throughput sequencing and microarray expression analysis and the types of data these techniques generate.

GUIDO BORDIGNON, M.S., Ph.D.

ONLINE | June 16-September 28 Enrollment accepted through August 25 Fee: \$765.

Section Number NATSC.X446.5.(800)





#### YOU MAY BE CLOSER TO A CERTIFICATE THAN YOU REALIZE

Are you just a few courses away from earning a bioscience certificate? Let us review your academic record and help to fast track your goals.

# Biotechnology

#### CERTIFICATE PROGRAM

# Biotechnology

#### PROGRAM SUMMARY

The Bay Area is a leader in the global biopharmaceutical industry, with local companies and research institutions setting the pace in the discovery and development of biopharmaceuticals to target major unmet medical conditions, such as cardiovascular disease, cancer, AIDS and other degenerative diseases.

The Biotechnology Certificate equips professionals with a rich background in the principles, processes and technologies central to biotechnology. This combination of general and practical knowledge enhances the skills of professionals currently working in this industry and helps prepare others to enter this dynamic field. The certificate program provides a solid understanding of the scientific disciplines that underlie the industry's activities, a foundation in the principles that guide drug discovery and development, an appreciation of cuttingedge bioscience research and technology, and a broader awareness of today's biopharmaceutical industry.

This program benefits professionals from all disciplines who want to develop a solid scientific foundation in the principles and applications of biotechnology, in order

to work more effectively in or transition into the biopharmaceutical sector.

#### CERTIFICATE REQUIREMENTS

To satisfy the requirements for the Certificate in Biotechnology, you must complete the **four required courses** as indicated in both Core A and B, and **8 units of electives** from Track 1 and Track 2, for a minimum total of **19 units**. For GPA requirements and program time limits, see page 90.

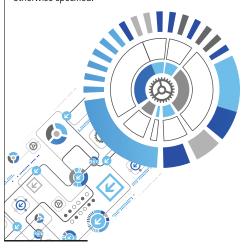
To pursue two bioscience-related certificates in parallel or in sequence, see box item below.

#### **PREREQUISITES**

Familiarity with the principles of modern molecular biology is required. Completion of "Molecular Biology, Introduction" or an equivalent course taken within the last five years, or equivalent experience satisfies this requirement. Please direct questions about the suitability of a prerequisite to extensionprogram@ucsc. edu. For those new to the industry, we recommend that "Biotechnology Basics for Non-Scientists" be taken prior to starting other course work.

#### RECOMMENDED COURSE SEQUENCE

We recommend that you begin with "Drug Discovery, Introduction" or "Drug Development Process." After that, you may take courses in any sequence, unless otherwise specified.



# Biosciences

UCSC Extension's bioscience courses and programs address the needs of Bay Area companies and new and experienced industry professionals. Taught by experts from Silicon Valley's biotechnology, pharmaceutical, and medical device sectors, our



courses offer participants the knowledge base, industry perspectives and important connections needed to build a strong career.

Many of our bioscience certificate programs

are known throughout the industry as unparalleled in rigor and quality. Whether you are interested in learning about the scientific, clinical, computational, regulatory or business aspects of the bioscience fields, UCSC Silicon Valley Extension can help you succeed.

#### **FEATURED SUMMER COURSES**

Drug Quality Fundamentals: Quality Control of Small Molecule Drugs and Biologics	15
Medical Device Verification and Validation	19
Molecular Diagnostics	15

#### LEARN MORE FOR LESS

Do you know that 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 pursuing two certificates need to complete the total number of units indicated in the table below, including all the required courses for both programs. In order to obtain two certificates with the fewest number of units, students must 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	Χ
Medical Devices	31 units	31 units	17 units	31 units	Χ
Regulatory Affairs	32 units	32 units	31 units	19 units	Χ
Bioinformatics	30 units	Х	Х	X	16 units

# ACCESS TO ONLINE COURSES AND MATERIALS



If you are enrolling for the first time in an Online course, or a classroom course with Online Materials, you will receive an account for UCSC Extension Online via email within 12 hours. If you have previously taken a course with online materials, you should use your existing account. Course sites will open one day prior to the official start date.

For more information, including help retrieving your account info, please visit **ucsc-extension.edu/online-faqs.** 

For information on textbooks, see page 92 or visit **ucsc-extension.edu/bookstore.** 

#### **BIOTECHNOLOGY CERTIFICATE** 19-unit minimum PREREQUISITE COURSE Units REQUIRED COURSES A AND B (four) Core A—Both required Drug Development Process......2.0 Core B—Choose 2 of 4 **ELECTIVE COURSES** (8 units required; at least one unit must be from each track.) Track 1: Discovery Biology of Cancer......2.0 DNA Microarrays–Principles, Applications and Data Analysis......3.0 Gene Expression and Pathways ......2.0 Human Physiology in Health and Disease .......3.0 Viruses, Vaccines and Gene Therapy ......1.5 Track 2: Development Drug Quality Fundamentals: Quality Control of Small Molecule Drugs and Biologics.............1.5 Molecular Diagnostics ......1.5 RECOMMENDED COURSE Any **one course** from UCSC Extension's Bioinformatics, Clinical Trials Design and Management, Medical

Certificate schedule outline of program curriculum and annual schedule are found online. From the homepage, select: "Area of Study"; department; then certificate title as listed above.

Devices or Regulatory Affairs Certificate Programs may be applied toward the elective unit requirement for



the Biotechnology Certificate.

#### MEDICAL AND HEALTH CAREER PREPARATION

## Considering a career in medicine?

Medical schools recommend that applicants study advanced topics in biosciences as they relate to health and disease. At UCSC Extension, we offer a variety of courses that fulfill the suggested electives for medical, dental and veterinary colleges.

### Required Courses

#### **Cellular Biology**

NATSC.X428.1 (3.0 quarter units) Professional Credit: CA BRN/LVN Credit–Provider #CEP13114, 30.0 hours.

Essential to any understanding of biology and its practical applications is an appreciation of the structures, functions and complex biological processes at work in the cell. This course covers the essential concepts of cellular biology, including the functions of cellular macromolecules, subcellular organization, nuclear control of cellular activity, cytoskeleton, cell signaling, cancer and more. You'll also learn the experimental approaches used to explore cellular activities.

JUAN JOSE FUNG. Ph.D.

ONLINE | June 16—September 28 Enrollment accepted through August 25 Fee: \$765

Section Number NATSC.X428.1.(800)

# Experimental Methods in Molecular Biology

For course description, see page 12.

#### Immunology, Principles

NATSC.X426.3 (3.0 quarter units) Professional Credit: CA BRN/LVN Credit-Provider #CEP13114, 30.0 hours.

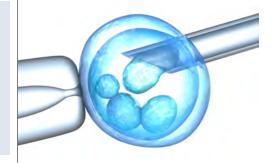
Explore the fundamental principles of immunology along with recent developments in the field and their implications for drug discovery and development, as well as disease treatment. Topics include innate, humoral and cell-mediated immunity; the clonal selection of lymphocytes; antigens, antibodies and their interactions; antibody gene rearrangement; lymphocyte development; and aspects of clinical immunology such as inflammation. Also covered are the immune response to bacterial, viral, fungal and parasitic diseases; vaccines; AIDS and other immunodeficiencies; autoimmune diseases; allergies; transplantation immunology; and cancer. Throughout the course, immunological techniques important in research and clinical laboratories are highlighted.

Prerequisite(s): Knowledge of general microbiology and basic chemistry. Knowledge of cell biology is recommended.

SREENIVASAN PARUTHIYIL, Ph.D.

CLASSROOM WITH ONLINE MATERIALS 9 meetings | 6–9:30 pm | June 20–September 5 Fee: \$765.

Section Number NATSC.X426.3.(1)



### Elective Courses Track 1 - Discovery

#### Stem Cell Biology

BIOL.X400.110 (1.5 quarter units) Professional Credit: CA BRN/LVN Credit-Provider #CEP13114, 15.0 hours.

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.

*Prerequisite(s):* Basic cell biology knowledge is recommended but not required.

CASEY CHRISTOPHER CASE, Ph.D.

CLASSROOM WITH ONLINE MATERIALS 5 meetings | 6–9 pm | May 16–June 13 Fee: \$595.

Section Number 13567.(014)

#### Toxicology Basics for Biotechnology

NATSC.X429.3 (1.5 quarter units) Professional Credit: CA BRN/LVN Credit-Provider #CEP13114, 15.0 hours.

Biopharmaceutical companies expend vast resources to identify new chemical and biological agents that have the potential for clinical benefit. However, before these 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, and toxicity testing. Applications in both pharmacology and drug development are discussed.

*Prerequisite(s):* Completion of at least one college-level chemistry course.

RONALD TJEERDEMA, Ph.D., DABT

ONLINE | June 16–September 28 Enrollment accepted through August 25 Fee: \$580.

Section Number NATSC.X429.3.(800)

### Elective Courses Track 2 - Development

#### Drug Quality Fundamentals: Quality Control of Small Molecule Drugs and Biologics

BIOL.X400.429 (1.5 quarter units)

This introductory course introduces key drug quality concepts and standards for the pharmaceutical and biotechnology industries. Interactive lectures explore quality system and control process best practices in clinical development, drug manufacturing and for commercial products. You'll learn the roles and responsibilities of quality assurance (QA) and quality control (QC) in ensuring the safety, efficacy and quality of drug products. You'll contrast specific quality attributes of large-molecule recombinant biological products with those of small molecule drugs. The course surveys the analytical chemistry methodologies used to assess and control physicochemical properties.

Prerequisite(s): "Drug Development Process," and "Good Manufacturing Practices," and "Regulation of Drugs and Biologics."

MICHAEL DONG, Ph.D.

CLASSROOM WITH ONLINE MATERIALS 2 meetings | 8 am–5 pm | July 14–15 Fee: \$600.

Section Number BIOL.X400.429.(1)

#### **Good Manufacturing Practices**

For course description, see page 20.

#### **Molecular Diagnostics**

BIOL.X400.414 (1.5 quarter units) Professional Credit: CA BRN/LVN Credit—Provider #CEP13114, 15.0 hours.

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. The instructor examines the role of pharmacogenomics in the development of new therapeutics and treatment options and uses case studies to present the applications of molecular diagnostic tools in infectious disease identification and early detection and diagnosis of cancer.

*Prerequisite(s):* "Molecular Biology, Introduction," or college-level biology.

PARISA MOUSAVI-SHAFAEI, Ph.D.

CLASSROOM WITH ONLINE MATERIALS
4 meetings | 9:30 am-3:30 pm | July 22 and 29;
9:30 am-12:30 pm | July 8 and August 5

Section Number BIOL.X400.414.(1)



# INFO

#### Biosciences Programs

For course description, see page 11.

#### ENROLL EARLY!

Enroll at least seven days prior to your course's start date to save your seat and allow time to prepare for the first class meeting. Enrolling early also helps ensure that your course is not cancelled due to low enrollment.

# ACCESS TO ONLINE COURSES AND MATERIALS



If you are enrolling for the first time in an Online course, or a classroom course with Online Materials, you will receive an account for UCSC Extension Online via email within 12 hours. If you have previously taken a course with online materials, you should use your existing account. Course sites will open one day prior to the official start date.

For more information, including help retrieving your account info, please visit **ucsc-extension.edu/online-faqs.** 

For information on textbooks, see page 92 or visit **ucsc-extension.edu/bookstore.** 

# Clinical Trials Design and Management

#### CERTIFICATE PROGRAM

## Clinical Trials Design and Management

#### PROGRAM SUMMARY

The Bay Area and Silicon Valley are leaders in the global biopharmaceutical and medical device industries. The continued success of these industries relies on clinical trials—the complex process of ensuring the safety and effectiveness of new and existing medical products.

UCSC Extension's Certificate in Clinical Trials Design and Management is unparalleled in rigor and quality. It helps professionals gain a solid and practical understanding of the entire clinical trials process—from drug and device development to monitoring—as well as a foundation in the scientific principles, regulations and ethics that are vitally important to the conduct of clinical research. Because of its comprehensive curriculum and intense focus on best practices in the clinical trial process, this certificate is appropriate for current professionals—clinical research associates and coordinators, clinical program managers and physicians, biomedical and research scientists, nurses, IRB members and administrators, and pharmacists—as well as those new to the field.

Many courses in this program qualify for recertification CEUs for those certified as CCRAs and CCRCs through ACRP. Most courses also grant BRN credit for nursing professionals.

#### CERTIFICATE REQUIREMENTS

To obtain the Certificate in Clinical Trials Design and Management, you must complete **6 required courses** and **6 units of elective courses**, for a minimum total of **19 units**. For GPA requirements and program time limits, see page 90.

To pursue two bioscience-related certificates in parallel or sequence, see page 13.

#### PREREQUISITES

Successful completion of "Medical/Clinical Terminology," an equivalent course, or medical training is required. We strongly recommend that students without a medical background take "Human Physiology in Health and Disease" early in their studies.

#### RECOMMENDED COURSE SEQUENCE

We recommend that you begin the program with "Drug Development Process" after completing the prerequisites. You may then take courses in any sequence, unless otherwise specified.

PROGRAM CHAIR



MICHAEL HUSTON, B.S., M.B.A., principal of Huston Associates, LLC, has more than 30 years of experience in development, from basic research to strategic drug development. He has directed project teams through lead identification, IND-enabling and nonclinical pharmacology studies, Phase 1–3 clinical studies; and several new drug applications (NDA), abbreviated new drug applications (ANDA) and biologic license applications (BLA); and product launches. He currently consults for interdisciplinary programs in drug development. Mr. Huston has taught for UCSC Extension since 1999.

### Required Courses

#### **Clinical Statistics for Non-Statisticians**

NATSC.X424.8 (2.0 quarter units) Professional Credit: CA BRN/LVN Credit-Provider #CEP13114, 24.0 hours.

Clinical studies succeed or fail on the strength of their statistics. This course takes a practical approach to fundamental statistical concepts essential for non-statisticians 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 statistics encountered in clinical research and how to communicate effectively with statisticians. The approach is practical, simple and qualitative. No previous background in statistics is required.

**INSTRUCTOR TBA** 

CLASSROOM WITH ONLINE MATERIALS 8 meetings | 6–9 pm | July 17–September 18 Fee: \$750

Section Number NATSC.X424.8.(1)



# Medical Devices: Regulatory Strategies and Marketing Pathways

NATSC.X425.6 (1.5 quarter units) Professional Credit: CA BRN/LVN Credit–Provider #CEP13114, 15.0 hours.

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.

CLARISA TATE, B.S.

CLASSROOM WITH ONLINE MATERIALS
5 meetings | 6–9 pm | June 27–August 8
Fee: \$675

Section Number NATSC.X425.6.(1)

#### Regulation of Medical Devices and Diagnostics

For course description, see page 21.

#### Science of Clinical Trials Design

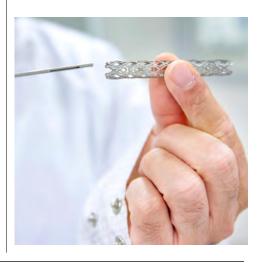
NATSC.X424.2 (2.5 quarter units) Professional Credit: CA BRN/LVN Credit-Provider #CEP13114, 25.0 hours.

This course reviews the science that grounds effective clinical trial design, covering study procedures, basic protocol, pharmacoeconomics, ethical considerations and more. You'll learn to classify and describe trial design by stage in drug and device development, define hypothesis and study objectives, and determine population and sample size. Topics include safety information measures, stopping rules, local standards of practice affecting clinical trials, validity of design, execution, analysis and reporting, and working with marketing to identify unmet medical needs. You'll gain hands-on experience designing clinical trials synopses and Phase 2 development strategies.

MICHAEL HUSTON, B.S., M.B.A.

CLASSROOM WITH ONLINE MATERIALS 6 meetings | 5:45–10 pm | July 6–August 24 Fee: \$765

Section Number NATSC.X424.2.(1)



### **Elective Courses**

#### Clinical Trials Site Monitoring II

NATSC.X424.9 (1.5 quarter units) Professional Credit: CA BRN/LVN Credit-Provider #CEP13114, 15.0 hours.

This course explores a range of approaches to monitoring clinical sites, the development of monitoring plans and some of the more challenging aspects of monitoring clinical trials. Remote data entry, compliance audits, regulatory issues that arise in compliance audits, fraud and misconduct are also addressed. This course is designed for clinical research associates (CRAs) or those planning to become a CRA, clinical trial managers and clinical operations managers.

Prerequisite(s): "Clinical Trials Site Monitoring I." SAVITA SINHA, M.Sc.

CLASSROOM WITH ONLINE MATERIALS 3 meetings | 5–9 pm | June 16–23; and 8:30 am–5 pm | June 24 Fee: \$580.

Section Number NATSC.X424.9.(1)

# Contracting with Contract Research Organizations (CROs)

BUSAD.X477.9 (1.5 quarter units) Professional Credit: CA BRN/LVN Credit—Provider #CEP13114, 15.0 hours.

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. This course takes a practical look at the identification, selection, and management of CROs in the performance of clinical projects. Other topics of discussion include selecting the best CRO for a project; request for proposal (RFP) components; bid review and negotiation; types of agreements; defining roles and responsibilities; and managing the work once the contract is signed.

**INSTRUCTOR TBA** 

CLASSROOM WITH ONLINE MATERIALS 2 meetings | 8:30 am—5 pm | August 25—26 Fee: \$580.

Section Number BUSAD.X477.9.(1)



# STANFORD CLINICAL RESEARCH INTERNSHIP PROGRAM

for recent Graduates of UCSC Extension's Clinical Trials Design and Management Certificate Program

Qualifying recent graduates from the Clinical Trials Design and Management Certificate Program may have the opportunity to bring their course work to life and gain valuable experience in a clinical research setting at Stanford. Space is limited.

#### CLINICAL TRIALS DESIGN AND MANAGEMENT CERTIFICATE

19-unit minimum

PREREQUISITE COURSES	Units
Medical/Clinical Terminology	0.7 ceu
Human Physiology in Health and Disease (Recommended)	
REQUIRED COURSES (13 units)	Units
Drug Development Process	2.0
* Medical Devices: Regulatory Strategies and Marketing Pathways <b>OR</b>	
Regulation of Medical Devices and Diagnostics	1.5
Good Clinical Practices	3.0
Clinical Trials Site Monitoring I	2.0
Science of Clinical Trials Design	2.5
Clinical Statistics for Non-Statisticians	
* Refer to web site for more information.	

ELECTIVE COURSES (6 units required)	Units
Clinical Data Management	2.0
Clinical Project Management	2.0
Clinical Research: The Study Site Perspective	1.5
Clinical Trials Site Monitoring II	
Contracting with Contract Research Organizations (CROs)	
Data Privacy and Security for Healthcare and Biosciences	
Document Preparation: Protocols, Reports, Summaries	1.5
Drug Safety and Adverse Events Reporting	1.5
Electronic Data Capture for Clinical Trials	1.0
Good Manufacturing Practices	3.0
Medical Writing	2.0
Preparing for FDA Inspections and Conducting Sponsor Audits	

Any **one course** from UCSC Extension's Regulatory Affairs Certificate Program may be applied toward the elective unit requirement for the Clinical Trials Design and Management Certificate.

Certificate schedule outline of program curriculum and annual schedule are found online. From the homepage, select: "Area of Study"; department; then certificate title as listed above.

### ACRP: ASSOCIATION OF CLINICAL RESEARCH PROFESSIONALS CONTACT HOURS

Many of the required and elective courses in UCSC Extension's Clinical Trials Certificate Program qualify as contact hours toward ACRP recertification. See the Association of Clinical Research Professionals website at acrpnet.org for certification information.

#### BRN: BOARD OF REGISTERED NURSING

All courses designated BRN are approved for continuing education hours for RNs and LVNs (Provider #CEP13114).

### RAPS: REGULATORY AFFAIRS PROFESSIONAL SOCIETY CREDIT

Many of the required and elective courses in UCSC Extension's Clinical Trials and Regulatory Affairs certificate programs qualify for points toward recertification for RAC. See the Regulatory Affairs Professionals Society at www.raps.org for details.

#### Document Preparation: Protocols, Reports, Summaries

NATSC.X425.7 (1.5 quarter units) Professional Credit: CA BRN/LVN Credit–Provider #CEP13114, 15.0 hours.

Clinical trial documentation must be clear, scientifically sound, conform to regulations and established standard operating procedures, and follow regulatory guidelines. This course provides insight into the preparation of effective documentation for clinical trials, including study protocols, reports, and summaries. Participants have opportunities to create sample documents and apply the rules governing clinical trial documentation.

*Prerequisite(s):* "Good Clinical Practices" or equivalent course or experience.

**INSTRUCTOR TBA** 

CLASSROOM WITH ONLINE MATERIALS 2 meetings | 8:30 am-5 pm | May 20-June 17 Fee: \$580.

Section Number 2636.(023)

#### Drug Safety and Adverse Events Reporting

NATSC.X427.2 (1.5 quarter units) Professional Credit: CA BRN/LVN Credit-Provider #CEP13114, 15.0 hours.

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.

Prerequisite(s): "Good Clinical Practices," and "Medical/Clinical Terminology."

NARINDER SINGH, M.B.A., PharmD

CLASSROOM WITH ONLINE MATERIALS 2 meetings | 8:30 am—5 pm | June 3—10 Fee: \$580

Section Number 3990.(026)

### **Good Manufacturing Practices**

For course description, see page 20.

#### **Medical Writing**

For course description, see web site.



# Medical Devices

#### CERTIFICATE PROGRAM

### **Medical Devices**

#### PROGRAM SUMMARY

Medical devices include a broad spectrum of products, from the simple tongue depressor to surgically implanted stents and *in vitro* diagnostics. Altogether, the U.S. medical device market is estimated at approximately \$100 billion. The Bay Area is home to one of the highest concentrations

of medical device start-ups in the U.S., with a broad array of established companies that vary in size, core technology and therapeutic focus. There are exciting opportunities in this robust industry for professionals from a range of disciplines.

The Medical Devices Certificate program covers topics that are critical to the development and commercialization of safe and effective medical devices and *in vitro* diagnostics (IVDs). Taking a practical and hands-on approach, the courses build a solid foundation that spans product design and development, regulatory and quality issues, innovation strategy, risk management and more.

Experienced and aspiring medical device professionals will gain insight into the technological, regulatory and business aspects of the industry and learn what it takes to be successful in the dynamic and highly regulated medical device industry. Courses in this program will benefit professionals from a wide range of disciplines.

#### AUDIENCE

- Those who want to enter the expanding field of medical devices
- Cross-development teams from medical device and IVD (in vitro diagnostics) companies; including those in quality assurance (QA), regulatory, R&D, product development, software and hardware engineering, product management, customer support, product verification and validation, marketing, operations/ manufacturing and clinical research

#### CERTIFICATE REQUIREMENTS

Total of 17 units

- 11 required units
- 6 elective units

For GPA requirements and program time limits, see page 90. To pursue two bioscience-related certificates in parallel or in sequence, see chart on page 13.

#### PREREQUISITES

There are no prerequisites for entering this program, although an understanding of statistics is necessary. "Statistics" (23588) is recommended for students entering the program without prior knowledge.

#### RECOMMENDED COURSE SEQUENCE

Those new to the field should start by taking "Quality Systems for Medical Devices: FDA QSR and ISO 13485," (formerly "Medical Device Quality Systems"), followed by "Introduction to Medical Device Regulation." After that, core courses can be taken in any order. For those with experience in this field, courses can be taken in any order.

### **PROGRAM CHAIR**Medical Devices and Regulatory Affairs



KIRAN GULATI, B.S., M.B.A., RAB-LA, is a management consultant with more than 20 years of experience in quality systems and process improvement for the medical device and biotech sectors. She has taught for UCSC Extension since 2006. Ms. Gulati has held positions at Genentech and McGhan Medical (formerly Collagen Corporation), where she managed the auditing and quality system training functions. Ms. Gulati has extensive experience designing and presenting training for companies in domestic as well as international settings. Since 2001, she has helped a large number of medical device startups and established companies achieve successful results during ISO 13485, CE Mark assessments and FDA audits.

Ms. Gulati serves on the advisory board for UCSC Extension's Medical Devices and Regulatory Affairs Certificate programs. In addition, she has been a speaker at conferences sponsored by the Institute of Validation Technology (IVT) and the ASQ Silicon Valley Division. Ms. Gulati served as the RAPS San Francisco/Bay Area Chair from 2011 to 2014 and is currently on the RAPS North American Advisory Board.



### Required Courses

# Regulation of Medical Devices and Diagnostics

For course description, see page 21.



#### **Elective Courses**

# Global Medical Device Submissions and Strategy

For course description, see page 21.

#### **Medical Device Verification and Validation**

BME.X400.135 (1.5 quarter units)

Proper verification and validation ensures that a medical device and its manufacturing process meet its design input requirements and conform to user needs and uses. This course reviews regulatory terminology and discusses how to implement a cost-effective medical device verification and validation program. Topics include site validation master plan requirements; the validation of computer systems, facilities, utilities, laboratory instrumentation and manufacturing processes; process validation requirements stated in ISO 13485 and FDA regulations; writing effective verification and validation plans, protocols and final results reports. The course benefits professionals from cross-functional teams in the medical device sector.

Prerequisite(s): Knowledge of regulatory compliance for medical devices is helpful.

BHARAT (BILL) KURANI, M.S.R.A., M.S.E.E.

CLASSROOM WITH ONLINE MATERIALS 5 meetings | 6–9 pm | July 24–August 28 Fee: \$750

Section Number BME.X400.135.(1)

#### MEDICAL DEVICES CERTIFICATE

#### 17-unit minimum

REQUIRED COURSES (12.5 units required)	Units
** Regulation of Medical Devices and Diagnostics	3.0
Quality Systems for Medical Devices: FDA QSR and ISO 13485	2.5
Design Control for Medical Devices	2.0
Risk Management for Regulated Industries	3.0
Human Factors and Usability in Medical Device Development	2.0

\*\* Students who have already completed Introduction to Medical Device Regulation Course: 30058, do not need to retake Regulation of Medical Devices and Diagnostics Course NATSC.X400.(017).

Data Privacy and Security for Healthcare and Biosciences
Global Medical Device Submissions and Strategy 1.5
diobal Mcalcal Device Jubinissions and Strategy
Medical Device Marketing
Medical Device Verification and Validation1.5
Mobile Health: The Evolving Industry and Regulatory Landscape
Mobile Medical Applications
Post-Market Regulatory Obligations for Medical Devices
Regulation of <i>in vitro</i> Diagnostics in Europe and the U.S
Validating Software for Medical Devices and Emerging Technologies2.0
Value-Added Quality Audits1.5

Any **one course** from UCSC Extension's Regulatory Affairs Certificate Program may be applied toward the elective unit requirement for the Medical Devices Certificate.

Certificate schedule outline of program curriculum and annual schedule are found online. From the homepage, select: "Area of Study"; department; then certificate title as listed above.

# INFO

#### Biosciences Programs



For course description, see page 11.

#### **ENROLL EARLY!**

Enroll at least seven days prior to your course's start date to save your seat and allow time to prepare for the first class meeting. Enrolling early also helps ensure that your course is not cancelled due to low enrollment.

## Medical Devices Advisory Board

DOUG ALLEAVITCH, M.B.A., M.S., Vice President of Quality and Operation, Nevro

PEPE DAVIS, Ph.D., Vice President of Business Process Excellence, Carl Zeiss Meditec, Inc.

STEVE GEERDES, CQA, Director of Regulatory Affairs and Quality Assurance, Zonare

KRISTEN GRUMET, B.A., Executive Director, NSF Healthcare

KIRAN GULATI, B.S., M.B.A., RAB-LA, Management Consultant and Program Chair, UCSC Extension's Medical Devices and Regulatory Affairs Certificate Program

CONNIE HOY, B.A., Senior Vice President of Regulatory Affairs and Quality, Cynosure, Inc.

RON KORONKOWSKI, B.S., Director of Quality and Regulatory, Vention Medical Design and Development, Inc.

DIANA LANE, B.A., Director Quality Management and Regulatory Affairs, Roche Sequencing Solutions

# Regulatory Affairs

#### CERTIFICATE PROGRAM

# Regulatory Affairs

#### PROGRAM SUMMARY

Regulatory affairs professionals play critical roles in ensuring compliance with the laws and regulations guiding the development and commercialization of healthcare products. As Bay Area bioscience companies grow and mature, their need for trained regulatory personnel intensifies. Recent industry studies cite regulatory affairs as one of the most crucial human resource needs in the coming decade. However, there are currently few options available in our region for formal, in-depth training for early-stage regulatory professionals.

The Regulatory Affairs Certificate was developed under the guidance of industry and government experts to provide a broad regulatory foundation, exposure to practical, real-world applications of the regulations, and an appreciation of the important roles that regulatory affairs professionals play in the bioscience industry. Courses are taught by experienced regulatory professionals currently working in the device, diagnostic, pharmaceutical and biologic sectors. Instructors bring the regulations to life with relevant examples and hands-on exercises designed to prepare students for rewarding careers in regulatory affairs.

#### **CERTIFICATE REQUIREMENTS**

To obtain the Certificate in Regulatory Affairs, students must complete the six required courses and **5 units of elective courses**, for a minimum total of **19 units**. For GPA requirements and program time limits, see page 90.

To pursue two bioscience-related certificates in parallel or sequence, see page 13.

#### PREREQUISITES

Given the scientific foundations of the bioscience industry and the importance of effective communication to the regulatory role, students who come to the program with a basic understanding of the life sciences and strong written and oral communication skills will benefit most from this program.

#### RECOMMENDED COURSE SEQUENCE

We recommend students begin the program 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."

# View each courses' full schedule online at ucsc-extension.edu

#### REGULATORY AFFAIRS CERTIFICATE

7

#### 19-unit minimum

REQUIRED COURSES (SIX)	Units
Regulation of Medical Devices and Diagnostics Regulation of Drugs and Biologics Interacting with the FDA	3.0
Regulation of Drugs and Biologics	3.0
Interacting with the FDA	1.5
One of the following*	
Drug Development Process <i>OR</i>	2.0
Design Control for Medical Devices	2.0
One of the following*	
Regulatory Submissions: Drugs and Biologics <i>OR</i>	2.0
Regulatory Submissions: Devices and Diagnostics	
One of the following*	
Good Manufacturing Practices <b>OR</b>	3.0
Quality Systems for Medical Devices: FDA QSR and ISO 13485	2.5
* The remaining required courses may be used as electives.	
,	
ELECTIVE COURSES (4–5 units required, must meet minimum 19 units overall)	Units
Drug Quality Fundamentals: Quality Control of Small Molecules and Biologics	
Global Medical Device Submissions and Strategy	15
Good Clinical Practices	3.0
Medical Device Marketing	3.0 3.0
Medical Device Marketing	3.0 3.0 1.0
Medical Device Marketing	3.0 1.0 1.5
Medical Device Marketing	3.0 1.0 1.5
Medical Device Marketing	3.0 1.0 1.5 1.5
Medical Device Marketing	3.0 1.0 1.5 1.5 2.5
Medical Device Marketing	3.0 1.0 1.5 1.5 2.5 3.0
Medical Device Marketing	3.0 1.0 1.5 1.5 2.5 3.0
Medical Device Marketing	3.0 1.0 1.5 1.5 2.5 3.0

Any **one course** from UCSC Extension's Clinical Trials Design and Management or Medical Devices Certificate Programs may be applied toward the elective unit requirement for the Regulatory Affairs Certificate.

Certificate schedule outline of program curriculum and annual schedule are found online. From the homepage, select: "Area of Study"; department; then certificate title as listed above.

### Required Courses

#### **Good Manufacturing Practices**

BUSAD.X479.6 (3.0 quarter units) Professional Credit: CA BRN/LVN Credit-Provider #CEP13114, 30.0 hours.

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.

INSTRUCTOR TBA

CLASSROOM WITH ONLINE MATERIALS
4 meetings | 8 am—5 pm | July 22—August 19
Fee: \$825.

Section Number BUSAD.X479.6.(1)

#### Interacting with the FDA

NATSC.X400.027 (1.5 quarter units)

Regulatory affairs professionals interact with the U.S. Food and Drug Administration (FDA) throughout a biomedical product's life cycle. Lectures, case studies and roleplaying explore interactions that industry has with the FDA, including inspections and key meetings. You'll learn how to prepare for these important events. The course highlights the FDA's structure, mission, jurisdiction and roles, reviews agency centers and field offices, and examines key societal, political, industrial and biomedical drivers that impact policies, priorities, and the U.S. regulatory environment. This course benefits regulatory professionals and anyone who interfaces with the FDA.

MICHELLE CARPENTER, J.D., RAC

CLASSROOM WITH ONLINE MATERIALS 5 meetings | 6–9 pm | July 12–August 23 Fee: \$700.

Section Number NATSC.X400.027.(1)

# Regulation of Medical Devices and Diagnostics

NATSC.X400.017 (3.0 quarter units)

What's the origin story of a medical device? This course defines medical devices, introduces the medical device industry and the historical roots of device regulation. You'll learn about key routes to market, including 510(k) premarket notification and premarket approval applications (PMA). You'll be exposed to the rationale and strategies for these paths, as well as post-market surveillance tools employed by FDA, uses of clinical data for pre-market and reimbursement purposes, and the investigational device exemption (IDE) application process. The course covers international laws and regulations in relation to U.S. counterparts.

Prerequisite(s): "Quality Systems for Medical Devices: FDA QSR and ISO 13485 formerly titled Medical Device Quality Systems."

CLARISA TATE, B.S.

CLASSROOM WITH ONLINE MATERIALS 10 meetings | 6–9 pm | June 27–September 12 Fee: \$825.

Section Number NATSC.X400.017.(1)



#### Regulatory Submissions: Drugs and Biologics

NATSC.X400.014 (2.0 quarter units)

This practical course uses approved drug labels and summary basis of approvals to help students acquire the knowledge and insight needed to understand and begin to construct core U.S. drug and biologics submissions, including premarketing (IND), marketing (NDA/CTD) and postmarketing documents. 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. Students also gain experience with tools that help manage timelines and sections needed from contributors.

Prerequisite(s): "Drug Development Process," and "Regulation of Drugs and Biologics."

INSTRUCTOR TBA

CLASSROOM WITH ONLINE MATERIALS 8 meetings | 6–9 pm | July 17–September 25 Fee: \$860.

Section Number NATSC.X400.014.(1)

#### **Elective Courses**

#### Drug Quality Fundamentals: Quality Control of Small Molecule Drugs and Biologics

For course description, see page 15.

#### Global Medical Device Submissions and Strategy

NATSC.X400.032 (1.5 quarter units)

The global nature of the medical device industry presents opportunities and challenges for medical device companies and regulatory affairs professionals who must navigate a diverse regulatory terrain. In this course, students gain a practical understanding of international medical device requirements and regulations for major and emerging markets around the world, including the EU, Canada, Japan, China and Brazil. A comparative approach highlights similarities and differences between countries and underscores the impact they have on global regulatory and business strategies.

Prerequisite(s): Given the fast-paced, information-rich nature of this course, prior completion of the "Regulation of Medical Devices and Diagnostics" or equivalent course or work experience is required.

**INSTRUCTOR TBA** 

CLASSROOM WITH ONLINE MATERIALS 2 meetings | 8:30 am—5 pm | June 24—July 8 Fee: \$750.

Section Number NATSC.X400.032.(1)

### **HAZWOPER**

#### 8-Hour Annual HAZWOPER Refresher

ENVS.828. (0.8 CEUs) Professional Credit: CSPs can claim COC points 0.8. This event contains .8 CEUs or 8 hours of technical contact time and is eligible for ABIH CM credit.

Professionals who have completed the "40-Hour Hazardous Waste Operations and Emergency Response Training" course 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."

JAY JAMALI, B.S., CSP, CHCM, CHMM

CLASSROOM WITH ONLINE MATERIALS 1 meeting | 8 am–5 pm | June 16 Fee: \$265.

Section Number 5363.(100)

# ACCESS TO ONLINE COURSES AND MATERIALS



If you are enrolling for the first time in an Online course, or a classroom course with Online Materials, you will receive an account for UCSC Extension Online via email within 12 hours. If you have previously taken a course with online materials, you should use your existing account. Course sites will open one day prior to the official start date.

For more information, including help retrieving your account info, please visit ucsc-extension.edu/online-faqs.

For information on textbooks, see page 92 or visit **ucsc-extension.edu/bookstore.** 

# LEAD

# Business & Management

WHAT STUDENTS SAV

"Now I have both the writing background and the digital marketing knowledge to push an organization into the next 10 years.



#### TRAVIS SUMMERS

#### Marketing

When Travis Summers earned his degree in print journalism in the mid-2000s, the industry landscape was shifting. After working as an assistant sports editor at a newspaper, he realized that the job he had been trained to pursue didn't exist as such anymore. That's when he discovered that that he was eligible for workforce retraining—funds that he could apply toward pursuing a certificate in Marketing at UCSC Extension. Shortly after completing the program in 2016, Summers landed a job as marketing project specialist.

#### Forward-Thinking Curriculum

"UCSC Extension offered the best chance to prepare for a digital marketing career, between its search engine optimization, search engine marketing, Web writing and social media marketing classes," he says. "Now I have both the writing background and the digital marketing knowledge to push an organization into the next 10 years."

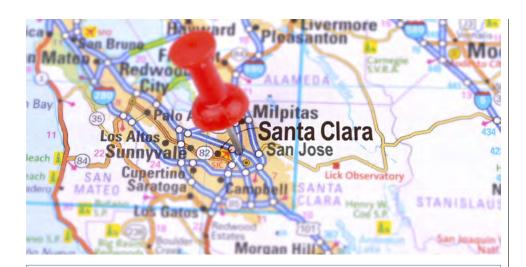
#### Portfolio-Worthy Work

Summers applied many of the skills he learned in class to building out his website.

"One main thing I learned in my 'Web Writing That Works' class was to write to your demographic as well as your secondary market," he says. "My blog speaks to people who don't have a job, and it functions as a portfolio piece. I used some of my class projects as portfolio pieces and built out my blog, which allowed me to stand out in a crowded field. The state of California gave me money to transition into a career field, and one month after completing my program, I have the perfect entry-level job."

Tell Us Your Story

We'd love to hear how you applied new skills in the workplace, or how your new credentials led to exciting job opportunities. Share your latest achievements by submitting your Extension story to extensionfeedback@ucsc.edu.



# Silicon Valley Expertise at Your Fingertips

Our Business and Management Department provides working professionals with UC-quality training in 10 disciplines. We are accredited by WASC's Commission for Senior Colleges and Universities.

Whether you are testing the waters, changing careers, pursuing a degree track, or seeking a recognized credential, you'll benefit from the academic-quality course work we offer at a fraction of the cost elsewhere.

While our curriculum is modeled after the nation's best business, graduate and professional schools, instruction is grounded in real-world practice, designed and taught by local expert practitioners, and approved by the Chair of the world-renowned UCSC Economics Department.

	Certificate Available	Academic Credit	Certification Preparation	Certification Authority
Accounting	•	•	CPA CIA EA	CA Board of Accounting Institute of Internal Auditors Internal Revenue Service
Bookkeeping	•	•	РВ	American Institute of Professional Bookkeepers
Business Administration	•	•	МВА	UC Berkeley, CSU East Bay, Golden Gate University, San José State Univ. School of Business, St. Mary's College of California, Notre Dame de Namur University
Administrative and Executive Assistants				
Personal Financial Planning	•	•	CFP®	Certified Financial Planning Board
Human Resources	•	•	PHR®, SPHR®, GPHR®, PHR-ca®	HR Certification Institute
Marketing				
Paralegal (Core & Advanced)			CA Paralegal	California Business an Professional Code §6450
Project Management		•	CAPM <sup>®</sup> , PMP <sup>®</sup> , PgMP <sup>®</sup> , MPM	Project Management Institute American Academy of Project Management
Technical Writing and Communication		•		

### **BUSINESS & MANAGEMENT** IN THIS SECTION 24 Accounting ▶ Administrative and Executive Assistant 27 ▶ Bookkeeping 29 Business Administration 29 30 ▶ Financial Planning ▶ Human Resource Management 32 ▶ Legal Studies 35 ▶ Marketing 36 ▶ Minimum Continuing Legal Credit 38 (MCLE) ▶ Project and Program Management 39 ▶ Technical Writing and Communication

# Accounting

#### **PROGRAMS**

In recent years, accounting has undergone major change. For aspiring CFOs, the CPA remains the gold standard credential. For mid-career financial managers and accountants, the CMA is a great alternative.

We offer two state-of-the-art programs to help get you there:

- Certificate in Accounting (CPA foundation)
- Accounting core for CPA candidates

Our introductory courses qualify for credit toward accounting degrees and CPA continuing education units.

CPA candidates can also fulfill 100 percent of their general business education requirements by taking courses from our Business Administration, Human Resources, Project Management and Marketing programs.

#### CERTIFICATE PROGRAM

# Accounting

#### PROGRAM SUMMARY

Professional accountants must position themselves as savvy financial and managerial analysts to advance their careers.

#### AUDIENCE

- Aspiring M.B.A.s
- Business owners
- Corporate managers
- Technical professionals
- Bookkeepers who want to move up
- Accounting assistants
- Anyone wanting to understand accounting

#### CERTIFICATE REQUIREMENTS

Total of four required courses.

#### MCLE CREDIT

- "Introduction to Accounting I: Financial Accounting," 38.5 hours
- "Introduction to Accounting II: Managerial Accounting," 38.5 hours

#### PROGRAM CHAIR



DIANNE CONRY, M.S. in financial accounting, CPA, is a consultant with Kranz & Associates and has more than 20 years of accounting experience both in public accounting (Pricewaterhouse Coopers) and in private industry (Sony Electronics, Accretive Solutions, Clinimetrics and RoseRyan). She is an experienced instructor who has taught financial accounting at several area colleges and has been teaching with UCSC Extension since 1996.

### Required Courses

#### Intermediate Accounting I

BUSAD.X436.4 (4.0 quarter units)

Designed for those specializing in accounting, this intermediate-level course covers the theory and application of accounting. The course emphasizes revenue recognition, current assets and liabilities, and fixed asset accounting.

Prerequisite(s): "Introduction to Accounting II: Managerial Accounting," and "Introduction to Accounting I: Financial Accounting."

DANIEL SPINOZZI, M.B.A.

CLASSROOM WITH ONLINE MATERIALS 10 meetings | 6 am-10 pm | July 6-September 7 Fee: \$775.

Section Number 5675.(071)

#### Intermediate Accounting II

BUSAD.X436.5 (4.0 quarter 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.

Prerequisite(s): "Introduction to Accounting II: Managerial Accounting," and "Introduction to Accounting I: Financial Accounting," and "Intermediate Accounting I."

BRETT LAYTON, M.S., CPA

CLASSROOM WITH ONLINE MATERIALS 10 meetings | 6–10 pm | July 11–September 12 Fee: \$775.

Section Number 6381.(067)

# Introduction to Accounting I: Financial Accounting

BUSAD.X434.8 (4.0 quarter units) Professional Credit: MCLE–Minimum Continuing Legal Education State Board of CA.; HRCI–PHR, SPHR and GPHR strategic recertification credit.

The fundamentals of financial accounting are presented in this course, as well as the identification, measurement and reporting of the financial impacts of economic events on enterprises. Topics include 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; depreciation of operational assets; accounting for investments; and accounting for liabilities and present value concepts.

DIANNE CONRY, M.S. CPA

CLASSROOM WITH ONLINE MATERIALS 10 meetings | 6–10 pm | July 5–September 6 Fee: \$775.

Section Number 3658.(160)

# Introduction to Accounting II: Managerial Accounting

BUSAD.X434.9 (4.0 quarter units) Professional Credit: MCLE–Minimum Continuing Legal Education State Board of CA, 38.5 hours; HRCI–PHR, SPHR and GPHR strategic recertification credit, 37.5 hours.

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.

 $\ensuremath{\textit{Prerequisite(s):}}$  "Introduction to Accounting I: Financial Accounting."

DANIEL SPINOZZI, M.B.A.

CLASSROOM WITH ONLINE MATERIALS 10 meetings | 6–10 pm | July 11–September 12 Fee: \$775.

Section Number 1224.(081)



#### **ACCOUNTING PROGRAMS**

#### Not unit-specific

ACCOUNTING CERTIFICATE REQUIRED COURSES	Units
Introduction to Accounting I: Financial Accounting	
Introduction to Accounting II: Managerial Accounting	
Intermediate Accounting I	
Intermediate Accounting II	4.0
CPA PREPARATION	Units
Accounting (36 units required)	
Advanced Accounting	
Auditing and Attestation	
Corporate Income Tax Accounting	
Cost Accounting	4.0
Financial Statement Analysis	
Income Tax Accounting	4.0
Introduction to Accounting I: Financial Accounting	4.0
Introduction to Accounting II: Managerial Accounting	
Intermediate Accounting I	
Intermediate Accounting II	4.0
General Business (36 units required)	
Business and Professional Writing	2.0
Business Law and Its Environment	3.0
Finance I, Fundamentals	3.0
Finance for the Business Professional	
Business Statistics I	
Business Statistics II	
Implementing Winning Marketing Strategies	2.0
Integrated Marketing Communication	
Macroeconomics, Introduction	
Management and Organization, Principles	
Microeconomics, Introduction	4.0
Organizational Development and Change, Introduction	2.0
Principles of Marketing	2.0
Project Leadership and Communication	3.0
Power of Market Research	
Role of the Project Manager	1.5
CERTIFIED BOOKKEEPER PROGRAM	Units
Certified Bookkeeper Program	7.5 CEUS

Certificate schedule outline of program curriculum and annual schedule are found online. From the homepage, select: "Area of Study"; department; then certificate title as listed above.



# Get University of California Santa Cruz Credit!

Several UCSC Extension courses are recognized by the UCSC Economics Department and may be used to waive the corresponding UCSC economics degree requirements. The following courses apply:

#### **UCSC Extension Courses**

- X434.8, Introduction to Accounting I: Financial Accounting
- X434.9, Introduction to Accounting II: Managerial Accounting
  - X414, Introduction to Microeconomics
  - X415, Introduction to Macroeconomics

## Qualify to waive the following UCSC Courses

- 10A, Economics of Accounting
- 10B, Economics of Accounting
  - Introductory Microeconomics: Resource Allocation and Market Structure
  - 2, Introductory Macroeconomics: Aggregate Economic Activity

If you have questions, call (408) 861-3860



or email extensionprogram@ucsc.edu.

# CPA Preparation

#### PROGRAM SUMMARY

The accountant's role encompasses a great deal of analysis, making the position more important and certainly more complex. This program addresses these issues and offers students the background needed to remain successful in this field.

This program helps participants meet the requirements to take the Certified Public Accountant (CPA) examination—still the gold standard credential in the profession.

#### GOALS

The goals of this program are to provide:

- More advanced training on complex accounting issues
- Advanced U.S. accounting principles for professionals trained in other countries
- Academic accounting requirements and accounting units to prepare students to take the CPA examination

#### COURSES

We offer 10 accounting courses (40 quarter units) and 16 general business courses (36 quarter units). The minimum requirements for taking the CPA exam in California are:

- A bachelor's degree
- 36 quarter units of accounting
- 36 guarter units of general business courses.

Candidates must complete all educational requirements prior to sitting for the exam.

For more information, please refer to the California Board of Accountancy at dca.ca.gov/cba.

## CalCPA

The California Society of CPAs is the nation's largest state accounting organization and the largest CPA association in California. It serves almost 35,000 members in public practice, private industry, education and government. CalCPA's student membership offers individuals an opportunity to connect early with the CPA profession and includes free résumé posting, discounts on the CPA Exam, access to employers at local networking events, and much more. Visit www.calcpa.org.

# View each courses' full schedule online at ucsc-extension.edu

### Accounting-General Business

#### **Business and Professional Writing**

For course description, see page 28.

#### **Business Statistics II**

For course description, see page 29.

#### Finance for the Business Professional

For course description, see page 28.

#### Finance I, Fundamentals

For course description, see page 29.

#### Financial Statement Analysis

BUSAD.X400.001 (4.0 quarter units) Professional Credit: MCLE–Minimum Continuing Legal Education State Board of CA, 40.0 hours.

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

Prerequisite(s): "Introduction to Accounting II: Managerial Accounting," and "Introduction to Accounting I: Financial Accounting."

BRETT LAYTON, M.S., CPA

CLASSROOM WITH ONLINE MATERIALS 10 meetings | 6–9 pm | June 19–August 21 Fee: \$775.

Section Number 6938.(019)

# Introduction to Accounting I: Financial Accounting

For course description, see page 24.

# Introduction to Accounting II: Managerial Accounting

For course description, see page 24.

#### Intermediate Accounting I

For course description, see page 24.

#### Intermediate Accounting II

For course description, see page 24.

#### Organizational Development and Change, Introduction

For course description, see page 34.

#### Principles of Marketing

For course description, see page 36.

#### **Project Leadership and Communication**

For course description, see page 40.

#### Role of the Project Manager

For course description, see page 40.





# Administrative and Executive Assistant

#### CERTIFICATE PROGRAM

### Administrative and Executive Assistant

#### PROGRAM SUMMARY

This is the profession the *Mercury News* calls "the power behind the CEO," and ours is the training program that is generating all the excitement in Silicon Valley.

Enroll in the Bay Area's only training program for administrative and executive assistants. Whether you are looking to enter the profession or aiming for the next level, you'll receive tailored instruction and mentoring delivered by experienced CEO and executive assistants. This program will help get you into one of the most-sought-after jobs in the market today!

Acquire essential skills while learning methods that your manager will notice immediately:

- Increase your productivity and effectiveness
- Improve your ability to organize and prioritize
- Expand your network and build alliances
- Develop self-confidence
- Garner respect for your position, yourself and others
- Set realistic goals for yourself that achieve positive results

Adding this certificate to your résumé can open doors to Fortune 500 companies, regardless of your educational background.

#### AUDIENCE

- Administrative professionals at any level
- Current assistants seeking improved skill-sets
- Mid-career assistants wanting to enhance their prospects
- Career changers

#### CERTIFICATE REQUIREMENTS

Total of 14.5 units:

- 9 required units
- 5.5 elective units



#### PROGRAM CO-CHAIR



BONNIE TOKIWA-SAVAGE has more than 25 years of experience in the high-tech industry. She has taught for UCSC Extension since 2007. She is currently an executive assistant at Agilent Technologies. Ms. Savage's career includes similar positions at Avaya Inc., JDSU Corporation, Aspect Communications, Beyond.com and Skystream Corporation, early-stage and public companies in the e-commerce and Internet area. She is also a leader to the administrative teams, providing resources and insight to improve overall company efficiency and teamwork. Ms. Savage is a member of the Silicon Valley Catalyst Association (SVCA), a group of executive assistants to Silicon Valley CEOs.

#### PROGRAM CO-CHAIR



SHERRY PARSONS, B.S.B.M., has more than 30 years of experience in the administrative field and is currently senior executive assistant to the CMO & SVP/GM of Networking for Avaya, Inc. She has taught at UCSC Extension since 2006. Prior to joining Avaya, Ms. Parsons supported senior executives at Earthbound Farm, Network General, Aspect Communications, and Advanced Micro Devices in Silicon Valley. She is an advisory board member for the Hilton Santa Clara and a past advisory board member for the AdminAwards, Silicon Valley.

#### **ENROLL EARLY!**

Enroll at least seven days prior to your course's start date to save your seat and allow time to prepare for the first class meeting. Enrolling early also helps ensure that your course is not cancelled due to low enrollment.

### Administrative and Executive Assistant Advisory Board

BONNIE TOKIWA-SAVAGE, Executive Assistant, Agilent Technologies DEBBIE GROSS, CEA Assistant, Cisco Systems SHERRY PARSONS, Senior Executive Assistant, Avaya

### Required Courses

#### **Business and Professional Writing**

BUSAD.X440.9 (2.0 quarter 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 immediately improve your written business communications through concrete, no-nonsense tools that will serve you throughout your career. The workshop format provides action-oriented feedback that builds confidence through in-class exercises, while homework practice solidifies your new skills.

Prerequisite(s): Sound knowledge of English grammar.

LINDA RODGERS-PRICE, B.S., M.A.

CLASSROOM WITH ONLINE MATERIALS 6 meetings | 6-9:30 pm | June 19-July 31 Fee: \$660.

Section Number 5916.(059)

#### Finance for the Business Professional

BUSAD.X437.5 (1.0 quarter units) Professional Credit: HRCI-PHR, SPHR and GPHR strategic recertification credit.

This hands-on seminar focuses on learning to read, analyze and evaluate the numbers behind a good financial statement and their relevant data. Materials include the tools used to improve an organization's financial performance and to assess its competitive strength. The course covers key accounting concepts, financial statements, cash budgets, strategic plans, detailed budgets, and financial ratios.

DIANNE CONRY, M.S., CPA

CLASSROOM WITH ONLINE MATERIALS 4 meetings | 6-9:30 pm | July 11-August 1 Fee: \$515.

Section Number 30473.(005)

#### ADMINISTRATIVE AND EXECUTIVE ASSISTANT CERTIFICATE

#### 14.5-unit minimum

14.5-unit minimum	
REQUIRED COURSES (9 units are required.)	Units
Administrative and Executive Assistants' Practicum	2.0
Business and Professional Writing	2.0
Communication Skills for Administrative and Executive Assistants	
Finance for the Business Professional	1.0
Project Management for Administrative and Executive Assistants	2.0
ELECTIVE COURSES (5.5 units are required.)	Units
Adobe Illustrator, Introduction	1.5
Adobe Photoshop, Introduction	1.5
Business Grammar	2.0
Business Statistics I	2.5
Business Statistics II	2.5
Cross-Cultural Negotiation: Asian and Western Business Environments	1.5
Cultural Proficiency	2.0
Facilitation Skills	2.0
Graphic Design Fundamentals	2.0
HTML Fundamentals	2.0
Improving Your Business Presentation Skills	2.0
Interviewing for Success: Using Structured Interviewing Techniques	
Business Communications	2.0
Leading and Facilitating Productive Meetings	0.5
Leading People Through Change	0.5
Management and Organization, Principles	2.0
Organizational Development and Change, Introduction	2.0
Role of the Project Manager	1.5

Certificate schedule outline of program curriculum and annual schedule are found online. From the homepage, select: "Area of Study"; department; then certificate title as listed above.

#### Flective Courses

#### Adobe Photoshop, Introduction

For course description, see page 82.

#### **Business Statistics II**

For course description, see page 29.

#### Cross-Cultural Negotiation: Asian and **Western Business Environments**

For course description, see page 36.

#### **Cultural Proficiency**

For course description, see page 54.

#### HTML Fundamentals

For course description, see page 82.

#### **Improving Your Business** Presentation Skills

For course description, see web site.

#### Leading People Through Change

For course description, see page 34.

#### Organizational Development and Change, Introduction

For course description, see page 34.

#### Role of the Project Manager

For course description, see page 40.





# Bookkeeping



## Certified Bookkeeper Program

#### PROGRAM OVERVIEW

Bookkeepers need to have a competitive edge to enhance their standing and earning potential. According to the U.S. Bureau of Labor Statistics, Certified Bookkeepers will have the best prospects.

Our program is endorsed by the American Institute of Professional Bookkeepers and consists of a single 12-week course, during which you will:

- Receive in-depth instruction to prepare you for the three certification exams
- Complete personal-study workbooks outside of class
- Take the Certified Bookkeeper qualification examinations

#### PREREQUISITE

Two years of general-ledger bookkeeping experience or completion of "Introduction to Accounting I."

#### **AUDIENCE**

- Bookkeepers
- Accounting clerks
- Small-business owners
- Auditing clerks
- Anyone wanting to understand modern bookkeeping

Offered in the Fall Quarter, please visit our website for details.

### AMERICAN INSTITUTE OF PROFESSIONAL BOOKKEEPERS

AIPB—the American Institute of Professional Bookkeepers—is the bookkeeping profession's national association. AIPB's mission is to achieve recognition of bookkeepers as accounting professionals; keep bookkeepers up-to-date on changes in bookkeeping, accounting and tax; answer bookkeepers' everyday bookkeeping and accounting questions; and certify bookkeepers who meet high, national standards. Founded in 1987, the current membership is over 30,000.

# Business Administration

#### CERTIFICATE PROGRAM

### **Business Administration**

#### PROGRAM SUMMARY

Today's business leaders must command a broad set of skills—from sales and marketing to economics, finance, and management. This not only requires hands-on experience in the day-to-day aspects of running a business, but also fundamental training and education in the latest business administration practices. This program is designed to equip new managers, subject-matter professionals who have been promoted to management positions, and those interested in the broad theory of business to develop the competency in critical functions of business. We also offer a range of electives to target knowledge in specific subjects.

Individual courses may also fulfill MCLE and CPA continuing education requirements—which you can obtain through the Business Administration Certificate program at UCSC Silicon Valley Extension.

#### **CERTIFICATE REQUIREMENTS**

Five required courses: 14.0 units. Electives: 11.0 units

#### MCLE CREDIT

"Business Law and Its Environment," 29.0 credit hours

#### PROGRAM CHAIR



JEFF COX, B.A., M.S., is a veteran human resources professional with over 30 years of experience in the field. His areas of expertise include program development and improvement, executive and management development, maximizing employee performance, continuous improvement in operations, administration, HROD, healthcare, and hi-tech—software, hardware and infotechnology—in both for-profit and non-profit domestic and international companies. In addition, he regularly provides pro-bono advice to non-profit organizations.

Mr. Cox has twenty years of experience in academic program development, has taught more than 100 graduate and undergraduate courses in 30 subjects, and has authored courses in HR, International HR and international business.

### Required Courses

#### Finance I, Fundamentals

BUSAD.X441.6 (3.0 quarter units) Professional Credit: MCLE–Minimum Continuing Legal Education State Board of CA.

This course addresses the alignment of an organization's financial and corporate planning goals. Financial management, including fundamental principles, planning and evaluation, and appropriate financial tools are covered. Topics include: key financial ratios for business analysis; financial statement analysis; funding, financial forecasting and risk analysis; cost of capital and the time value of money; capital budgeting and investment risk; valuing stocks, bonds and preferred stocks; capital budgeting systems; and working capital and cash management.

MALKIET SANDHU, M.A.

CLASSROOM WITH ONLINE MATERIALS 10 meetings | 6–9 pm | June 9–August 11 Fee: \$745.

**Section Number 3636.(063)** 

#### Principles of Marketing

For course description, see page 36.

### **Elective Courses**

#### **Business Communications**

For course description, see web site.

#### **Business and Professional Writing**

For course description, see page 28.

#### Business Statistics II

BUSAD.X450.2 Professional Credit: HRCI-PHR, SPHR and GPHR strategic recertification credit, 24.72 hours.

The second half of the General 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.

Prerequisite(s): "Business Statistics I."

LAURENCE O'CONNELL, M.A.

ONLINE | June 27—September 15 Fee: \$720.

Section Number 6538.(046)

#### Cross-Cultural Negotiation: Asian and Western Business Environments

For course description, see page 36.

# Effective Negotiations: Principles, Strategies, and Techniques

For course description, see web site.

#### **BUSINESS ADMINISTRATION CERTIFICATE**

REQUIRED COURSES (14 units)	Units
Business Law and Its Environment Finance I, Fundamentals Management and Organization, Principles Microeconomics, Introduction Principles of Marketing	3.0 2.0 4.0 2.0
ELECTIVE COURSES (11 units)	Units
Business Essentials Business and Professional Writing	1.5 2.0 4.0
Financial Analysis/Accounting Business Statistics I	2.5 4.0 4.0
Management Development Business Communications Human Resources Management, Introduction Organizational Development and Change, Introduction Marketing Business Development	1.5
Marketing Operations 2.0: Tactical Discipline to Strategic Vision	2.0

Certificate schedule outline of program curriculum and annual schedule are found online. From the homepage, select: "Area of Study"; department; then certificate title as listed above.

#### Financial Statement Analysis

For course description, see page 26.

#### Human Resource Management, Introduction

For course description, see page 34.

# Introduction to Accounting I: Financial Accounting

For course description, see page 24.

# Introduction to Accounting II: Managerial Accounting

For course description, see page 24.

# Organizational Development and Change, Introduction

For course description, see page 34.

#### Product Management: Moving the Product to Market

For course description, see page 37.

### Also of Interest

#### Leading People Through Change

For course description, see page 34.

#### Role of the Project Manager

For course description, see page 40.

# Financial Planning

#### CERTIFICATE PROGRAM

## Personal Financial Planning

#### PROGRAM SUMMARY

Financial planning and wealth management remains a fast-growing field because of the complexity of the financial decisions confronting almost everyone, including the "Boomer" generation, which is about to retire en masse. This cultural and economic shift presents rewarding career opportunities for those interested in personal finance. UCSC Extension offers Silicon Valley's only CERTIFIED FINANCIAL PLANNER™® Board-registered program. Our training will ground you in CFP Board education requirements—fulfilling a qualification for you to sit for the rigorous CFP® examination.

Additionally, because of our program's alignment with the Financial Planning Association, you receive the unique opportunity to network within the professional community while earning this universally recognized credential. All our instructors are leading practitioners. They provide real-world practices and the latest information and insight into the field. Take individual courses to expand or update specific knowledge—or pursue the certificate and put yourself on track to become a CFP® professional.

#### AUDIENCE

- Anyone interested in their financial well-being
- Financial planners (uncredentialed)
- Real estate and mortgage professionals
- Accountants
- Attorneys
- Trust officers
- Stockbrokers
- Insurance agents
- Private bankers
- Career changers

#### PROGRAM PREREQUISITES

If you intend to pursue the Certificate in Personal Financial Planning (PFP) 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.

#### CERTIFICATE 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.

#### COURSE SEQUENCE

The two prerequisite courses ("Applied Mathematics for Financial Planning" and "PFP, Survey") must be completed prior to enrolling in the remaining courses. The final course for all candidates is the "Personal Financial Planning, Practicum."

# PERSONAL FINANCIAL PLANNING CERTIFICATE

#### Not unit-specific

PREREQUISITE COURSES	Units
Applied Mathematics for Financial Planning	3.0
Applied Mathematics for Financial Planning Personal Financial Planning, Survey	4.0
The state of the s	
REQUIRED COURSES	Units
Employment Benefits and Retirement Planning in Personal Financial Planning	3.5
Estate Planning	3.5
Income Taxation in Personal Financial Planning	3.5
Investments in Personal Financial Planning:	
Principles and Methods	
Risk Management in Personal Financial Planning	3.5
FINAL REQUIRED COURSE	Units
Personal Financial Planning, Practicum	3.0
ENROLLED AGENT PROGRAM	Units
Enrolled Agent Review, Part 1—Individuals	3.0
Enrolled Agent Review, Part 2—Businesses	3.5
Enrolled Agent Review, Part 3—Representation, Practices and Procedures	

Certificate schedule outline of program curriculum and annual schedule are found online. From the homepage, select: "Area of Study"; department; then certificate title as listed above.

#### ABOUT CFP® CERTIFICATION

Certified Financial Planner Board of Standards, Inc., owns the trademarks CFP®, CERTIFIED FINANCIAL PLANNER™ and CFP (with flame logo)® certification marks in the U.S., which it awards to individuals who successfully complete the CFP Board's initial and ongoing certification requirements.

UCSC Silicon Valley Extension does not certify individuals to use the CFP®, Certified Financial Planner™ or CFP (with flame logo)® certification marks. CFP® certification is granted only by the Certified Financial Planner Board of Standards, Inc., to those persons who, in addition to completing an educational requirement such as this CFP Board-registered program, have met its ethics, experience and examination requirements.

#### CFP® EXAMINATION INFORMATION

For information regarding the CFP® examination and experience requirements, please write the CFP Board, 1425 K St., NW, Suite 500, Washington, DC 20005, call toll-free (800) 487-1497, or visit www.cfp.net.

#### PROGRAM CHAIR



RENÉE SNOW, Ph.D., CFP®, EA, has worked as a Certified Financial Planner® for the past 20 years and has combined technical expertise with psychology and philosophy in service to her clients. She earned a M.S. in accounting and worked eight years for a large regional CPA firm. Dr. Snow manages her own firm and specializes in tax planning, asset management and the psychological aspects of wealth management. As a financial planning instructor at UCSC Extension, she grounds students in the philosophy of economics while giving them the practical tools to work in the financial services industry.

# Earn Graduate Credit!

Credit Transfer Agreement for Personal Financial Planning

#### Cal Lutheran

You can earn graduate degree credit by taking Personal Financial Planning courses at UCSC Extension, thanks to our articulation agreement with California Lutheran University—California Institute of Finance. Completion of Extension's Certificate in Personal Financial Planning equates to 15 graduate credits in the Cal Lutheran M.B.A. Financial Planning degree, with the following stipulations:

- The UCSC Extension Certificate in Personal Financial Planning must be completed before a student applies for admission to the M.B.A. in Financial Planning at Cal Lutheran University— Institute of Finance.
- 2) A grade of "B" or better must be earned in all Extension course work to qualify for credit towards the Cal Lutheran M.B.A. in Financial Planning. The courses required to earn the Extension certificate (28 quarter credit units) translate to 18.67 units (quarter credits are 67% of the semester credits) eligible for transfer to the California Lutheran University—Institute of Finance program in Financial Planning.
- 3) The following courses qualify for graduate credit towards the M.B.A. in Financial Planning:

Cal Lutheran Courses S	Semester Credits
a.BUS 501 Introduction to	
Financial Planning	3 credits
b.BUS 502 Tax Planning and Str	rategy 3 credits
c. BUS 505 Retirement Planning	3 credits
d.BUS 506 Insurance Planning	3 credits
e.BUS 507 Estate Planning	3 credits
Total	15 credits

#### PROGRAM ENDORSEMENTS



FPA: "SILICON VALLEY

#### FINANCIAL PLANNING ASSOCIATION

The Financial Planning Association (FPA) is the professional organization for financial planners. Career-oriented students in the Personal Financial Planning Certificate Program are encouraged to consider joining the FPA as associate members. The FPA may be contacted at fpasv.org.

### Personal Financial Planning Advisory Board

RENÉE SNOW, Ph.D., CFP®, EA CYNTHIA J. RILEY, B.S. ERIC SOLVE, CFP® JAMES PARK, B.S.

### Prerequisite Courses

#### Applied Mathematics for Financial Planning

BUSAD.X458.3 (3.0 quarter 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.

CYNTHIA RILEY, B.S.

CLASSROOM WITH ONLINE MATERIALS 10 meetings | 6-9pm | June 19 - August 28 Fee: \$690

Section Number 30486.(002)



# View each courses' full schedule online

### Required Courses

#### **Employment Benefits and Retirement** Planning in Personal Financial Planning

BUSAD.X460.2 (3.5 quarter units)

This course provides theoretical and practical insights into the retirement planning process, and includes methods to determine the adequacy of clients' retirement resources and income. In addition, the various employee benefit and government programs that provide health care and retirement security are covered. Topics include tax-deferred retirement plans (pension, profit sharing, 401(k), 403(b), 457, SEP, IRA, and other tax-qualified plans) as well as employee stock options and rights, nonqualified deferred compensation, group health and life insurance, Social Security and Medicare. 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.

Prerequisite(s): "Mathematics for Financial Planning," and "Personal Financial Planning, Survey."

SADIE POURFATHI, B.S., M.A., B.A.

CLASSROOM WITH ONLINE MATERIALS 10 meetings | 6-9:30 pm | June 22-August 24 Fee: \$720.

Section Number 6310.(046)

#### **Estate Planning**

BUSAD.X460.3 (3.5 quarter units) Professional Credit: MCLE-Minimum Continuing Legal Education State Board of CA, 30 hours.

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.

Prerequisite(s): "Mathematics for Financial Planning," and "Personal Financial Planning, Survey."

DAVID FREEMAN, J.D.

CLASSROOM WITH ONLINE MATERIALS 10 meetings | 6-9:30 pm | June 21-August 23 Fee: \$720.

Section Number 1743.(043)



# Human Resource Management

#### CERTIFICATE PROGRAM

## Human Resource Management

#### PROGRAM SUMMARY

Human resource management is a dynamic profession that continues to grow in complexity and stature. HR professionals need a broad, comprehensive skill set across all human resource functional areas in order to succeed.

Take individual courses to update specific skills or pursue the certificate for comprehensive training from the pros who share this important profession in Silicon Valley. Most of our courses are approved for credit by the HR Certification Institute and we offer five state-ofthe-art curricula to help you achieve your career goals:

- HRM Certificate: Our highly regarded generalist training for HR professionals
- Talent Acquisition and Workforce Planning: The latest in talent acquisition and sourcing practices, tools and strategy
- Leadership Development Specialty: Training, facilitation and instructional design, including content from our renowned Instructional Design and Delivery program
- Employee Relations Specialty: Performance management essentials focused on best practices and real-world
- HR Business Partner Specialty: Designed to build your business acumen and credibility "on the line" with internal clients.

Several courses fulfill MCLE credit requirements.

#### AUDIENCE

This program is designed for:

- Current HR professionals who want to upgrade or expand their skills
- · Career changers looking to explore HR
- Managers from technical fields or other fields who need HR knowledge to enhance their leadership skills

#### CERTIFICATE REQUIREMENTS

Total of 11 courses:

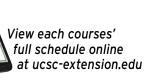
- Eight required courses
- Three elective courses

#### RECOMMENDED COURSE SEQUENCE

We recommend that you start with "Human Resource Management, Introduction."

#### MCLE CREDIT

• "Finance for the Non-Financial Manager," 13 hours



#### **HUMAN RESOURCE MANAGEMENT CERTIFICATE**

#### Not unit-specific.

REQUIRED COURSES	Units
Benefits Management: A Comprehensive Study of Employee Benefit Procompensation Management Effective Employee Relations Finance for the Business Professional Human Resource Management, Introduction Law and Human Resource Management Managing the Staffing Function Organizational Development and Change, Introduction	grams 2.0 2.0 1.5 1.0 1.5 2.0 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5
ELECTIVE COURSES (Choose three)	Units
Recruiting and Staffing Building Your HR Career From the Inside Out Interviewing for Success: Using Structured Interviewing Techniques Talent Acquisition 101 Effective Performance Management	0.5 1.5
Leadership Development Designing Training Programs Facilitation Skills Instructional Needs Assessment and Evaluation Leading People Through Change Learning Theories and Styles Business Communications Improving Your Business Presentation Skills	
Employee Relations Effective Negotiations: Principles, Strategies and Techniques Cultural Proficiency Terminating and Managing Problem Employees Workplace Investigations	2.0 0.5
HR Business Partners/Generalist HR Technology—What You Need to Know to Be a Technology Proponent Management and Organization, Principles	2.0

Certificate schedule outline of program curriculum and annual schedule are found online. From the homepage, select: "Area of Study"; department; then certificate title as listed above.

#### PROGRAM CHAIR

NANCY NELSON, B.A., SPHR-CA®, GPHR®, principal of HRProse, LLC, and has more than 20 years of experience managing a variety of corporate HR functions in the telecommunications and high-tech sectors. She has taught for UCSC Extension since 2007. She most recently served as HR director for Ultra Clean Technology. Ms. Nelson is past adjunct faculty in the CSU East Bay College of Business and Economics and has facilitated the Northern California Human Resource Association PHR/SHRM certification prep course. She is certified as a Senior Professional in Human Resources by the Human Resources Certification Institute.



#### HRCI PROVIDER APPROVAL



HR Certification Institute (HRCI), the national certification board for HR professionals, has certified our HRM program as an Approved Provider.

All our HRM courses now qualify for recertification credit hours, based on HRCI standards. Taking just three of our courses every two years can fulfill all recertification requirements. See hrci.org for complete details.

The use of this seal is not an endorsement by HRCI of the quality of the program. It means that this program has met HRCI's criteria to be pre-approved for recertification credit.

### Human Resource Management Advisory Board

NANCY NELSON, B.A., SPHR-CA®, GPHR® ROBERT COON, Ph.B., Wayne State University LEA VALENCIA DAVIS, M.B.A., Santa Clara University JEFF JACOBS, B.S., Santa Clara University STEPHEN McELFRESH, Ph.D. JD, SPHR®, Boston College RICK PARTRIDGE, M.Ed., Ed.S., University of Florida

# ACCESS TO ONLINE COURSES AND MATERIALS



If you are enrolling for the first time in an Online course, or a classroom course with Online Materials, you will receive an account for UCSC Extension Online via email within 12 hours. If you have previously taken a course with online materials, you should use your existing account. Course sites will open one day prior to the official start date.

For more information, including help retrieving your account info, please visit **ucsc-extension.edu/online-faqs.** 

For information on textbooks, see page 92 or visit **ucsc-extension.edu/bookstore.** 

### Required Courses

#### **Compensation Management**

BUSAD.X425. (2.0 quarter units) Professional Credit: HRCI–PHR, SPHR and GPHR general recertification credit, 22 hours.

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.

Prerequisite(s): "Human Resource Management, Introduction."

LYNN HUGHES, M.A., SPHR, CCP

ONLINE | June 9—August 4.

Fee: \$710.

Section Number 4506.(095)

#### **Effective Employee Relations**

BUSAD.X446.3 (1.5 quarter units) Professional Credit: HRCI–PHR, SPHR and GPHR general recertification credit, 16 5 hours

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; and the impact of mergers and acquisitions.

*Prerequisite(s):* "Human Resource Management, Introduction

JILL PODOLSKY, B.S.

CLASSROOM WITH ONLINE MATERIALS 5 meetings | 6–9 pm | May 17–June 14; and 9 am–4 pm | June 10

Fee: \$650.

Section Number 4698.(079)

CLASSROOM WITH ONLINE MATERIALS 5 meetings | 6–9 pm | July 10–31; and 9 am–4 pm | July 29 Fee: \$650.

Section Number 4698.(80)

### Human Resource Management, Introduction

BUSAD.X425.1 (1.5 quarter units)

Human resource management is a rapidly evolving profession. This introductory course and intensive overview provides an in-depth exploration of today's HR function and its place in the modern organization. Designed for those who are new to the field, as well as those who would like a refresher, this highly interactive course covers key HR functions through lecture, class discussions, and team exercises. You will be provided an overview of primary HR roles including talent acquisition, rewards strategy, business partnership, and other practices that are aligned to drive business success.

NANCY NELSON, B.A. PAT MAHONY, M.A., M.S.

CLASSROOM WITH ONLINE MATERIALS 2 meetings | 9 am—5 pm | August 26, September 9 Fee: \$610.

Section Number 5580.(149)

#### Organizational Development and Change, Introduction

BUSAD.X424.3 (2.0 quarter units) Professional Credit: HRCI-PHR, SPHR and GPHR general recertification credit.

Designed for those charged with bringing about change, this course is valuable for managers, human resource professionals, internal or external consultants, as well as those interested in pursuing a career in this field. The course is experiential and is delivered in a participative workshop style, which includes groupwork outside of class. An overview of OD, the nature of change, and the OD practitioner is provided. Topics include the 21st century organization; organizational structure, design, culture, systems and rewards; management and leadership; and diagnostic models and systematic change intervention.

JUDY LACROIX, B.A., M.B.A.

CLASSROOM WITH ONLINE MATERIALS 4 meetings | 9 am–4 pm | July 15–August 5 Fee: \$710.

**Section Number 2719.(099)** 

### **Elective Courses**

### **Cultural Proficiency**

For course description, see page 54.

#### **Designing Training Programs**

For course description, see page 54.

#### Improving Your Business Presentation Skills

BUSAD.X446.9 (2.0 quarter units)

Do you struggle with public speaking? This course is designed to help improve your presentations using simple, proven and effective techniques. Learn how to develop materials, communicate with confidence and use the power of your personal style. Through a series of improvisation exercises, the instructor guides you

through the process of triumphing over fear and becoming an inspired speaker. You will learn ways to cope with stage fright, grab the audience's attention, organize your presentation, open and close in a compelling manner, handle impromptu speaking, and simplify your message.

BILLIE SHEPARD, B.A.

CLASSROOM WITH ONLINE MATERIALS 3 meetings | 9am-5pm | July 8—July 22 Fee: \$680

Section Number 0913.(039)

# Instructional Needs Assessment and Evaluation

For course description, see page 54.

#### Leading People Through Change

BUSAD.X419.2 (0.5 quarter units)

Managers and supervisors often bear the responsibility of maintaining morale and productivity during difficult change processes. Achieving this goal effectively requires grasping the impact of change on people, understanding the change process, acquiring critical coping skills, optimizing 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 change process; fundamental processes in change management; and strategies for harnessing the power of change for you, employees and your organization. You will develop a personal action plan for leading people through change.

LYNN HUGHES, M.A.

ONLINE | June 9–23 Fee: \$420.

ree: \$420.

Section Number 4689.(022)

### **Learning Theories and Styles**

For course description, see page 54.

#### Role of the Project Manager

For course description, see page 40.

#### **Workplace Investigations**

BUSAD.X455.3 (0.5 quarter units) 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.

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.

DEANNA MOUSER, B.S., J.D., LLM

Section Number 5512.(025)

CLASSROOM WITH ONLINE MATERIALS 1 meeting | 9 am—5 pm | August 19 Fee: \$420.



# Legal Studies

### CERTIFICATES OF COMPLETION

### Paralegals

### PROGRAM SUMMARY

We offer The Center for Legal Studies' nationally acclaimed paralegal training online. Our comprehensive two-course sequence is designed for maximum efficiency of instruction and will prepare you for employment as a paralegal in the State of California.

### PROGRAM REQUIREMENTS

You must complete both the paralegal core courses and the advanced paralegal courses to meet the requirements for California Business and Professions Code 6450.

### **ONLINE COURSES**

The total number of class hours is comparable to classroom instruction offered elsewhere. Students are expected to complete an average of 15 hours of homework outside of class sessions.

- Core Paralegal Certificate Course
- Advanced Paralegal Certificate Course

### **2017 SESSION DATES**

Online courses are held during two seven-week sessions. The dates below reflect the available start dates for each 14-week course. End dates vary depending on when a student commences instruction.

- 2017 Session 1: January 9-February 24
- 2017 Session 2: March 6-April 21
- 2017 Session 3: May 1-June 16
- 2017 Session 4: June 26-August 11
- 2017 Session 5: August 21–October 6
- 2017 Session 6: October 16-December 1

Students will be required to purchase the Westlaw® access for this course directly from The Center for Legal Studies. The Center for Legal Studies will send students logon information on the day the session begins.



### CERTIFICATE OF COMPLETION

### Paralegal Core Course

### Paralegal Core Certificate Course

LGST.803. (9.0 CEUs)

Our core Paralegal curriculum is a 14-week intensive, nationally acclaimed program designed for beginning as well as advanced legal workers. The instruction is practice-oriented and relates to those areas of law in which paralegals are the most in demand:

- Legal terminology, documents, ethics and the litigation process
- Introduction to the evidentiary predicate, which covers the rules of evidence and civil procedure
- Identification of relevant authority
- Introduction to legal research practice, which covers research techniques for use in legal memoranda, motions, and briefs
- Legal research practice, which emphasizes shepardizing statutes, case law, and the use of computerized legal research terminal (Research assignments will be discussed and critiqued, and the West Key Number System® will be reviewed thoroughly)
- Legal writing and appellate procedure, which concentrates on the preparation and critique of legal memoranda, including an interoffice memorandum of law and an appellate brief

The subject material for this course is broken down into two seven-week modules: Paralegal I and Paralegal II.

The course fee includes both sessions. At the conclusion of Paralegal I, students will be asked to "enroll" for the second session (Paralegal II). Registration for Paralegal II is done through The Center for Legal Studies and not UCSC Extension.

Students will be required to purchase Westlaw® access for Paralegal II directly from The Center for Legal Studies. The Center for Legal Studies will send student logon information on the first day of class.

The section below is for the entire two part program.

ONLINE | June 26–August 11

Fee: \$1289.

Section Number 0710.(086)

ONLINE | August 21–October 6

Fee: \$1289.

Section Number 0710.(087)

### CERTIFICATE OF COMPLETION

### Advanced Paralegal Course

### **Advanced Paralegal Certificate Course**

LGST.809. (27.0 CEUs)

In this challenging course designed to meet the requirements of California Business and Professions Code §6450, participants choose six of the following topics: 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; and Water Law.

ONLINE | June 26—August 11 Fee: \$1800.

Section Number 5827.(081)

Prerequisite(s): "Paralegal Core Certificate Course."

ONLINE | August 21—October 6 Fee: \$1800.

Section Number 5827.(082)



### IMPORTANT INFORMATION

# Legal Studies

### **CURRICULUM DETAILS**

For curriculum details, textbooks, Westlaw access and syllabus, visit the CLS website at www.legalstudies.com, call (800) 522-7737 or email info@legalstudies.com.

### **COURSE FEE**

No courses offered in conjunction with The Center for Legal Studies qualify for discounts, gift certificates or comps.

### FOR ADDITIONAL INFORMATION

UCSC Extension Program Contact: Business and Management Department, (408) 861-3860, or email extensionprogram@ucsc.edu.

### **ENROLLMENT POLICY**

Students are subject to UCSC Extension policies and pay the fees associated with the policies. For our enrollment policies, please see page 90.



### **CERTIFICATE PROGRAM**

### Marketing Management

### PROGRAM SUMMARY

Nearly every industry relies on marketing professionals to promote their goods or services to retain and acquire customers. Customer-driven marketing has become increasingly important to Silicon Valley companies. Our marketing curriculum brings this orientation to the forefront and reflects the latest developments in marketing technology and practice.

We offer two tailored tracks that blend key principles with cutting-edge techniques:

- Marketing Management
- Digital Marketing (includes social media)

Take individual courses to expand or master the array of marketing disciplines from tactical know-how to strategic insight or pursue the certificate for comprehensive training from the pros that have helped make Silicon Valley what it is today.

### CERTIFICATE REQUIREMENTS

Total of 14 units

- 6.5 required units
- 7.5 elective units

### RECOMMENDED COURSE SEQUENCE

It is recommended you start with "Principles of Marketing."

### PROGRAM CHAIR



LY-HUONG PHAM, Ph.D., M.B.A., M.S., has over 30 years of experience as an executive in the high tech industry and is CEO of Mobiscale LLC, a provider of strategic management, educational, and software system development services. Ms. Pham has developed a co-creator index, a global sourcing framework to maximize competitive advantages as part of her research, and has over a dozen patents. Her clients range from startups to Fortune 500 companies in high-tech, social media, mobile, education and healthcare sectors.



### Required Courses

### **Principles of Marketing**

BUSAD.X433.5 (2.0 quarter units) Professional Credit: HRCI–PHR, SPHR and GPHR strategic recertification credit; MCLE–Minimum Continuing Legal Education State Board of CA, 19.25 hours.

This 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. You will also explore the impacts of changing lifestyles and international market forces on American buying patterns, consumer and organizational buying behaviors, and methods and resources for researching and segmenting markets.

STEVEN CLARKE, M.B.A., Ph.D.

ONLINE | June 13–July 18

Fee: \$630.

Section Number 0104.(078)

### **Elective Courses**

### **Business and Professional Writing**

For course description, see page 28.

### Cross-Cultural Negotiation: Asian and Western Business Environments

BUSAD.X401.13 (1.5 quarter units)

This course introduces the theory and practice of negotiations between Western and Asian cultures. Learn to develop conceptual frameworks to analyze negotiations and prepare effective cross-cultural negotiations skills. You will gain an understanding of the role of cross-cultural negotiations in shaping deals, building and salvaging relationships, and achieving better outcomes at the international bargaining table. Develop valuable planning techniques and tactics that you can use when entering or expanding your business in Asia. The course is designed for established and aspiring buyers, purchasers, manufacturers, sales people, project managers, human resources managers, and managers.

### MARKETING MANAGEMENT CERTIFICATE

14 units (Certificate students should complete the required units, and then the required final project\*.)

Implementing Winning Marketing Strategies 2.0 Integrated Marketing Communication 2.5 Principles of Marketing 2.0  SPECIALIZED ELECTIVES (7.5 units) 3.1  Digital Marketing Advanced Social Media Marketing: A Practical Approach for Business 1.5  Applied Digital Marketing for Business 2.0  CRM: Customer Relationship Management, Fundamentals 2.0  Customer Acquisition 2.0: Strategies, Retention and Win-Back 1.5  Database Management and Social Selling 1.5  Leveraging Social Media Partners 1.5  Search Engine Marketing 2.0  Fundamentals, Social Media Marketing 2.0  Web and Mobile Analytics 1.5  Web Writing That Works 1.5  Marketing Management 8  Business and Professional Writing 2.0  Cross-Cultural Negotiation: Asian and Western Business Environments 1.5  Consumer Insights: Data Analysis and Interpretation 1.5  Marketing Operations 2.0: Tactical Discipline to Strategic Vision 2.0  Medical Device Marketing 3.0  Power of Market Research 2.0  Positioning and Brand Management 1.5  Product Management: Moving the Product to Market 2.0  Public Relations: Winning the Mindshare Battle 1.5  Final Project *Capstone: Social Media 2.0	REQUIRED COURSES (6.5 units)	Units
Principles of Marketing Communication	Implementing Winning Marketing Strategies	2.0
SPECIALIZED ELECTIVES (7.5 units)UnitsDigital MarketingAdvanced Social Media Marketing: A Practical Approach for Business1.5Applied Digital Marketing for Business2.0CRM: Customer Relationship Management, Fundamentals2.0Customer Acquisition 2.0: Strategies, Retention and Win-Back1.5Database Management and Social Selling1.5Leveraging Social Media Partners1.5Search Engine Marketing2.0Fundamentals, Social Media Marketing2.0Web and Mobile Analytics1.5Web Writing That Works1.5Marketing Management1.5Business and Professional Writing2.0Cross-Cultural Negotiation: Asian and Western Business Environments1.5Consumer Insights: Data Analysis and Interpretation1.5Marketing Operations 2.0: Tactical Discipline to Strategic Vision2.0Medical Device Marketing3.0Power of Market Research2.0Positioning and Brand Management1.5Product Management: Moving the Product to Market2.0Public Relations: Winning the Mindshare Battle1.5	Integrated Marketing Communication	2.5
SPECIALIZED ELECTIVES (7.5 units)UnitsDigital MarketingAdvanced Social Media Marketing: A Practical Approach for Business1.5Applied Digital Marketing for Business2.0CRM: Customer Relationship Management, Fundamentals2.0Customer Acquisition 2.0: Strategies, Retention and Win-Back1.5Database Management and Social Selling1.5Leveraging Social Media Partners1.5Search Engine Marketing2.0Fundamentals, Social Media Marketing2.0Web and Mobile Analytics1.5Web Writing That Works1.5Marketing Management1.5Business and Professional Writing2.0Cross-Cultural Negotiation: Asian and Western Business Environments1.5Consumer Insights: Data Analysis and Interpretation1.5Marketing Operations 2.0: Tactical Discipline to Strategic Vision2.0Medical Device Marketing3.0Power of Market Research2.0Positioning and Brand Management1.5Product Management: Moving the Product to Market2.0Public Relations: Winning the Mindshare Battle1.5	Principles of Marketing	2.0
Advanced Social Media Marketing: A Practical Approach for Business		
Advanced Social Media Marketing: A Practical Approach for Business	Digital Maybeting	
Applied Digital Marketing for Business	Advanced Social Media Marketing: A Practical Approach for Rusiness	1 5
CRM: Customer Relationship Management, Fundamentals	Applied Digital Marketing for Pusiness	
Customer Acquisition 2.0: Strategies, Retention and Win-Back	CPM: Customer Polationship Management Fundamentals	2.0
Database Management and Social Selling		
Leveraging Social Media Partners		
Search Engine Marketing	Layoraging Social Modia Partners	1.5
Fundamentals, Social Media Marketing	Search Engine Marketing	2.0
Web and Mobile Analytics1.5Web Writing That Works1.5Marketing Management2.0Business and Professional Writing2.0Cross-Cultural Negotiation: Asian and Western Business Environments1.5Consumer Insights: Data Analysis and Interpretation1.5Marketing Operations 2.0: Tactical Discipline to Strategic Vision2.0Medical Device Marketing3.0Power of Market Research2.0Positioning and Brand Management1.5Product Management: Moving the Product to Market2.0Public Relations: Winning the Mindshare Battle1.5Final Project	Fundamentals Social Media Marketing	2.0
Web Writing That Works1.5Marketing Management2.0Business and Professional Writing2.0Cross-Cultural Negotiation: Asian and Western Business Environments1.5Consumer Insights: Data Analysis and Interpretation1.5Marketing Operations 2.0: Tactical Discipline to Strategic Vision2.0Medical Device Marketing3.0Power of Market Research2.0Positioning and Brand Management1.5Product Management: Moving the Product to Market2.0Public Relations: Winning the Mindshare Battle1.5Final Project	Weh and Mohile Analytics	1.5
Marketing Management Business and Professional Writing		
Business and Professional Writing	<b>3</b>	
Cross-Cultural Negotiation: Asian and Western Business Environments		
Consumer Insights: Data Analysis and Interpretation	Business and Professional Writing	2.0
Marketing Operations 2.0: Tactical Discipline to Strategic Vision	Cross-Cultural Negotiation: Asian and Western Business Environments	1.5
Medical Device Marketing		
Power of Market Research	Marketing Operations 2.0: Tactical Discipline to Strategic Vision	2.0
Positioning and Brand Management	Medical Device Marketing	3.0
Product Management: Moving the Product to Market		
Public Relations: Winning the Mindshare Battle1.5  Final Project	Positioning and Brand Management	1.5
Final Project	Product Management: Moving the Product to Market	2.0
	Public Relations: Winning the Mindshare Battle	1.5
	Final Project	
		2.0

Certificate schedule outline of program curriculum and annual schedule are found online. From the homepage, select: "Area of Study"; department; then certificate title as listed above.

STEVEN CLARKE, M.B.A., Ph.D.

ONLINE | June 13-July 18

Fee: \$610

Section Number 30236.(010)

### Customer Acquisition 2.0: Strategies, Retention and Win-Back

BUSAD.X400.087 (1.5 quarter 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. 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, and consumer trends. Numerous real world experience case studies are presented.

**INSTRUCTOR TBA** 

CLASSROOM WITH ONLINE MATERIALS 5 meetings | 9 am–12 pm | July 15–August 12 Fee: \$580

Section Number 22408.(013)

### **Database Marketing and Social Selling**

BUSAD.X441.3 (1.5 quarter units)

When marketers fail to track and follow up on customer interactions, they risk losing income and leads. The growth of social networking sites such as Facebook, LinkedIn and Twitter has created a new customer interaction channel that 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. This course addresses several aspects of the latest database marketing techniques, including how to augment the customer feedback loop, work with large data sets, and measure campaign effectiveness.

THOMAS MOYER, M.B.A.

CLASSROOM AND ONLINE (HYBRID)
5 meetings | 1–4 pm | July 15–August 12
Fee: \$580.

Section Number 3162.(012)

### **Leveraging Social Media Partners**

BUSAD.X400.098 (1.5 quarter units)

How do you leverage the business potential of social media? This course covers the opportunities, platforms, listening tools, and best practices of today's social landscape. You'll learn to use the three Ms of process improvement (Manage, Maximize and Measure), leverage conversations on Twitter and harvest Facebook, LinkedIn, Google+ and Twitter for business partners and customer leads. Hands-on exercises demonstrate how social listening and analytics can help you find, track and measure campaigns. Your final team project is to create a #partnersocial marketing business plan and present it to industry experts.

**INSTRUCTOR TBA** 

CLASSROOM WITH ONLINE MATERIALS 2 meetings | 9 am–5 pm | June 17–24 Fee: \$580.

Section Number 23098.(013)

### Product Management: Moving the Product to Market

BUSAD.X456.4 (2.0 quarter units)

This course is an in-depth introduction to product management, product marketing and product marketing engineering—from core concepts and terminology to process management. Participants learn to analyze customer needs, develop product requirements, and manage the process of shaping final products and taking them into the marketplace—all from the perspective of the customer advocate.

STEVEN CLARKE, M.B.A., Ph.D.

ONLINE | June 13-July 18

Fee: \$630.

Section Number 2466.(028)

### Public Relations: Winning the Mindshare Battle

BUSAD.X421.4 (1.5 quarter units)

It is critical that today's public relations practitioner be an integrated media person who can create an ongoing customer dialogue. This course explores how public relations can build credibility, trust, goodwill and reputation through a series of readings, exercises, case studies and guest speakers. Topics include trade shows, event management, wire services, search-optimized press releases, crisis communications, in-house versus agency PR, and ongoing public relations management. By the end of the course, you'll be able to apply key PR tools and identify a career path in media and analyst relations, etc.

GARY KATZ, M.S.O.D.

CLASSROOM WITH ONLINE MATERIALS 5 meetings | 6–9 pm | June 29–July 27 Fee: \$580.

Section Number 0511.(013)

### Web and Mobile Analytics

BUSAD.X400.105 (1.5 quarter units)

Web and mobile analytics play an important role in understanding and optimizing customer reach and growth. To compete in the Web 2.0 global economy, organizations need to employ agile digital marketing techniques that can continuously adapt to customer needs. This course covers metrics that help capture customer experience in Web and mobile environments and collect, filter and normalize data about individuals or groups.

Prerequisite(s): "Implementing Winning Marketing Strategies," "Principles of Marketing," and "Integrated Marketing Communication."

ASSIMAKIS (MIKE) TZAMALOUKAS, M.B.A., Ph.D.

CLASSROOM WITH ONLINE MATERIALS 2 meetings | 9 am–5 pm | August 19–26 Fee: \$580.

Section Number 23392.(012)

### Capstone: Social Media

BUSAD.X400.117 (2.0 quarter units)

This course is a capstone class that builds on the courses "Fundamentals of Social Media" and "Advanced Social Media Strategies," enabling you to apply the range of your newly acquired social media and marketing skills in a simulated real-world environment. The course will further sharpen your 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.

NATASCHA THOMSON, M.B.A.

LAB WITH ONLINE MATERIALS 6 meetings | 6-9:30pm | June 7–July 12 Fee: \$630

Section Number 30484.(002)

# ACCESS TO ONLINE COURSES AND MATERIALS



If you are enrolling for the first time in an Online course, or a classroom course with Online Materials, you will receive an account for UCSC Extension Online via email within 12 hours. If you have previously taken a course with online materials, you should use your existing account. Course sites will open one day prior to the official start date.

For more information, including help retrieving your account info, please visit

ucsc-extension.edu/online-faqs.

For information on textbooks, see page 92 or visit **ucsc-extension.edu/bookstore.** 

# Minimum Continuing Legal Credit (MCLE)

# MBA in Brief for Attorneys

### BETTER EQUIP YOURSELF TO RUN YOUR PRACTICE WHILE YOU FULFILL YOUR MCLE REQUIREMENTS

Learning to deal with the general business issues that attorneys confront in finance, accounting and management is part of your continuing professional education. The M.B.A. in Brief for Attorneys at UCSC Extension is designed to meet the goals and time constraints today's attorneys face. Our courses are accredited, convenient, and attractively priced to help you fulfill your Minimum Continuing Legal Education (MCLE) credit requirements.

You'll receive UC-quality instruction studying at UCSC Extension, where working professionals make us the choice for their advanced educational needs.

### Courses

### **Business Statistics II**

For course description, see page 29.

### **Estate Planning**

For course description, see page 32.

### Finance for the Business Professional

For course description, see page 28.

### Finance I, Fundamentals

For course description, see page 29.

### **Financial Statement Analysis**

For course description, see page 26.

# Introduction to Accounting I: Financial Accounting

For course description, see page 24.

# Introduction to Accounting II: Managerial Accounting

For course description, see page 24.

### Principles of Marketing

For course description, see page 36.

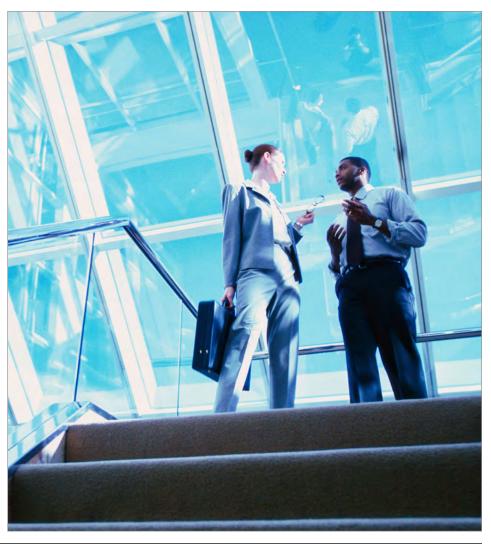
### **Workplace Investigations**

For course description, see page 34.

### **MCLE CREDIT**

COURSES	Hours
Accounting Introduction to Accounting I: Financial Accounting Introduction to Accounting II: Managerial Accounting Financial Statement Analysis Business Statistics II	38.5
Finance Estate Planning Finance I, Fundamentals Finance for the Business Professional	30.0 30.0 13.0
General Business Administration Business Law and Its Environment	19.25
Human Resources Management Law and Human Resource Management Terminating and Managing Problem Employees Workplace Investigations	6.0

Certificate schedule outline of program curriculum and annual schedule are found online. From the homepage, select: "Area of Study"; department; then certificate title as listed above.



# Project Management

### **CERTIFICATE PROGRAM**

### Project and Program Management

### PROGRAM SUMMARY

Learn project management the Silicon Valley way, and acquire the sophisticated project management methods and systems that are the benchmark of industry. We are certified with PMI®'s highest designation—Global Registered Education Provider. Our program is renowned for its real-world curriculum tailored to the fast-moving, constantly changing workplace in Silicon Valley.

Our instructors are working professionals and experts in their fields. They incorporate the newest technology and processes into our courses to ensure you graduate with cutting-edge skills.

### FLEXIBLE LEARNING OPTIONS

Take individual courses to expand or update specific skills, graduate with our certificate before becoming a certified PMI® Project Management Professional, or put yourself firmly on course for an M.S.

Our PPM Certificate's reputation is national, and our courses may qualify for credit toward Master of Science programs in project management and related disciplines at leading graduate schools.

### **CERTIFICATE REQUIREMENTS**

Total of seven courses:

- 4 required courses
- 3 elective courses

### COURSE SEQUENCE

"Role of the Project Manager" is the first required course.
"Role of the Project Manager," "Project Leadership and Communication," and "Project Integration and Risk Management" must be completed before enrolling in "Applied Project Management."

### PROGRAM CHAIR



FRANK MANGINI, M.S.E.E., M.B.A., PMP®, PMI®-ACP, CSP, has over 25 years of experience in project management and product development and served as the director of programs for the ARGOSystems/Boeing Electronic Defense Systems. He has taught for UCSC Extension since 2002. His special interests are project risk management, critical chain project management (CCPM) and Agile-Lean development projects.

### Required Courses

### **Applied Project Management**

BUSAD.X418. (3.0 quarter units) Professional Credit: Project Management Institute-PMP Professional Development Units 30 hours; HRCI-PHR, SPHR and GPHR general recertification credit, 27.5 hours.

In this final course, you'll be given tools to develop a realistic team project. The course emphasizes practical application of PM principles, processes, and techniques affecting control, cost management, project tracking, and outsourcing. You will learn how to minimize "scope creep." Topics include project portfolio management techniques, as well as how to estimate project costs and forecast investment returns, apply cybernetic-control techniques to schedules and budgets, use earned-value management (EVM) to track projects, fast-track and crash the project's critical path, and use stochastic techniques to ensure accurate project schedules.

Prerequisite(s): "Role of the Project Manager,"
"Project Integration and Risk Management," and
"Project Leadership and Communication."

BILL BROOKS, M.A., MPM, CIPM

CLASSROOM WITH ONLINE MATERIALS 10 meetings | 6–9 pm | June 20–August 29 Fee: \$880.

Section Number 5837.(143)

### Project Integration and Risk Management

BUSAD.X482.6 (3.0 quarter units) Professional Credit: Project Management Institute–PMP Professional Development Units 30.0 hours; HRCI–PHR, SPHR and GPHR general recertification credit, 27.5 hours.

Designed for project leaders, team members, engineering and marketing managers, directors and vice presidents, this course provides a proven set of global best practices to achieve fast time to market. It will equip you with project-integration and risk-management tools and techniques to 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; and successfully managing project risks.

Prerequisite(s): "Role of the Project Manager."

CARL RAND, M.B.A., PMP®

CLASSROOM WITH ONLINE MATERIALS 10 meetings | 6–9 pm | July 5–September 6 Fee: \$880.

Section Number 2356.(097)

FRANK MANGINI, M.B.A., M.S.E.E.

ONLINE | June 13—August 24 Fee: \$880.

Section Number 2356.(098)

### PROJECT MANAGEMENT INSTITUTE

PMI® is the global association of project management professionals that administers the popular PMP® Certification. Those individuals looking to make project management a career should consider joining PMI® at pmi.org.

### SILICON VALLEY PMI®

The Silicon Valley Chapter of PMI®, one of its most active chapters, serves the South Bay and can be reached at pmisv.org.





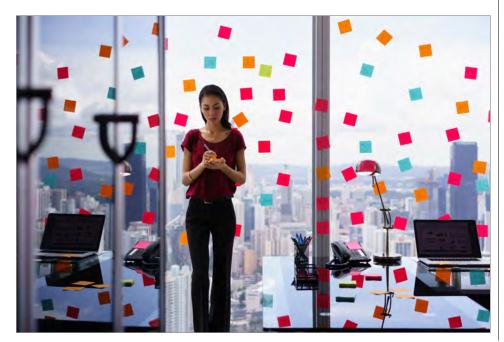
### Project and Program Management Advisory Board

FRANK M. MANGINI, M.S.E.E., M.B.A., PMP®, PMI®-ACP, CSP, Program Chair WILLIAM BROOKS, M.A., MPM, CIPM OLIVER GILDERSLEEVE, M.S.E.E., PMP® BLANCA PRADENAS, M.S. RICH RONDEAU, M.S., CSM, ITIL, PMP®

### PROJECT AND PROGRAM MANAGEMENT CERTIFICATE

Not unit-specific.	
S D	
REQUIRED COURSES	Units
Role of the Project Manager	1.5
Project Integration and Risk Management 1869	3.0
Project Leadership and Communication	3.0
Applied Project Management	3.0
ELECTIVE COURSES (Choose any three)	Units
Specialized Project Management	
Advanced Schedule Optimization Techniques	1.5
Agile Product Life-cycle Management (APLM)	1.5
Agile Project Management Using Scrum	1.5
Clinical Project Management	2.0
Creating the Successful Project Team	1.5
Decision-Making Tools and Techniques	1.5
Effective Negotiations: Principles, Strategies, and Techniques	1.5
Extreme/Agile Project Management	
Lean-Agile Project Management: Achieving Business Value	
Managing International Projects	
Managing Projects at Start-up Companies	
Managing Projects with Microsoft Project	1.5
Managing Software Projects	1.5
Managing the Development of New Products	1.5
Principles of Business Analysis	3.0
Project Procurement: Outsourcing and Contract Management	1.5
Schedule Optimization Techniques for Managers	1.5
Strategic Thinking and Problem Solving	2.0
SPECIAL OFFERING	Units
PMP® Preparation	2.5
PMP® Examination Preparation: 35 Hour	3.5 CEU

Certificate schedule outline of program curriculum and annual schedule are found online. From the homepage, select: "Area of Study"; department; then certificate title as listed above.



### **Project Leadership and Communication**

BUSAD.X486.5 (3.0 quarter units) Professional Credit: Project Management Institute-PMP Professional Development Units 30.0 hours; HRCI-PHR, SPHR and GPHR general recertification credit, 27.5 hours.

This course covers the soft skills needed to manage projects, including leadership, communications, team organization and development, conflict management, quality management, and negotiating. You'll explore aspects of participative management such as building commitment, leadership styles, organizational cultures and configurations, interpersonal skill development, project staffing, and working with distance-separated teams. You'll learn to establish project goals, overcome communication problems, write performance reports, and manage agreement. Topics include project leadership versus project management, improving project communications, building project commitment, managing conflict, and using the Johari Window to assess your interpersonal skills.

Prerequisite(s): "Role of the Project Manager."

ALAN TSUDA, M.B.A.

CLASSROOM WITH ONLINE MATERIALS

10 meetings | 6–9 pm | July 6–September 7

Section Number 4550.(094)

### Role of the Project Manager

BUSAD.X454.9 (1.5 quarter units) Professional Credit: Project Management Institute–PMP Professional Development Units 15 hours; HRCI–PHR, SPHR and GPHR general recertification credit, 13.75 hours.

This course is designed to acquaint you with project management and the roles that a project manager plays in the five primary processes involved in managing projects: 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; and understanding project phases and project life cycles. You'll learn the life cycle of typical projects and identify the diverse skills needed to successfully play these project manager roles.

ALAN TSUDA, M.B.A.

CLASSROOM WITH ONLINE MATERIALS 2 meetings | 8:30 am-5 pm | June 3-10 Fee: \$720.

Section Number 0306.(219)

VAIDEHI BHANDARI, M.S., PMP®

CLASSROOM WITH ONLINE MATERIALS 5 meetings | 6–9 pm | July 12–August 9 Fee: \$720.

Section Number 0306.(222)

SANJAY BHATIA, B.S., PMP®

ONLINE | July 10—August 14 Enrollment accepted through July 10 Fee: \$720.

Section Number 0306.(223)

### **Elective Courses**

### Agile Project Management Using Scrum

BUSAD.X400.111 (1.5 quarter 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, executing, monitoring, and 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.

Prerequisite(s): "Role of the Project Manager."

RAVI KALLURI, M.S.E.E., M.B.A., PMP®, CSM

CLASSROOM WITH ONLINE MATERIALS 3 meetings | 12 am—5 pm | June 3—17 Fee: \$720.

Section Number 23596.(014)

### **Creating the Successful Project Team**

BUSAD.X495.4 (1.5 quarter units) Professional Credit: Project Management Institute-PMP Professional Development Units, 15.0 hours

Explore the fundamental principles of teams and characteristics of highly effective teams. You'll gain perspective on how people work and why they think differently, how they make decisions and the mindset and behaviors that are conductive to effective team building and team performance. Additional topics include virtual teams, teams and change management, teams and high performance organization. Finally, you'll complete the course with a team tool kit to take home that includes practical techniques for effective team meetings, creative thinking, the decision-making framework, and constructive confrontation.

Prerequisite(s): "Role of the Project Manager."

SANJAY BHATIA, B.S., PMP®

ONLINE | July 18-August 22

Fee: \$720.

Section Number 1156.(042)

### Effective Negotiations: Principles, Strategies, and Techniques

For course description, see web site.

### Lean-Agile Project Management: Achieving Business Value

BUSAD.X400.110 (1.5 quarter units) Professional Credit: Project Management Institute–PMP Professional Development Units 15.0 hours

This course is an introduction to managing development projects and programs at both the team and enterprise levels using Agile and Lean processes. This course covers agile and lean thinking principles as implemented by the Scrum, Kanban and Scrumban project management frameworks. The course will also address the business case for agility, lean projects, portfolio management, and becoming a Lean-Agile enterprise. Other topics include the role of management in Lean-Agile development, the kaizen culture, mapping the value stream and the Kanban method for accelerating the delivery of business value.

Prerequisite(s): "Role of the Project Manager."

FRANK MANGINI, M.B.A., M.S.E.E.

CLASSROOM WITH ONLINE MATERIALS 5 meetings | 6–9 pm | August 8–September 5 Fee: \$720.

Section Number 23595.(012)

### Managing Projects at Start-up Companies

BUSAD.X479.8 (1.5 quarter units) Professional Credit: Project Management Institute-PMP Professional Development Units 15 hours

Standard practices and techniques in the Guide to the Project Management Body of Knowledge (PMBOK® Guide) Fifth Edition, Project Management, Institute, 2013, work very well at established companies, but are not always applicable to young companies or fast-track projects. In these turbulent environments, change occurs faster, so managers and executives need to learn how to customize and use generally accepted project-management practices in circumstances 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; and Web-based project management.

Prerequisite(s): "Role of the Project Manager

SANJAY BHATIA, B.S., PMP®

CLASSROOM WITH ONLINE MATERIALS 2 meetings | 8:30 am—5 pm | July 8—15 Fee: \$720.

Section Number 0338.(039)

### Managing Projects with Microsoft Project

BUSAD.X479.7 (1.5 quarter units) Professional Credit: Project Management Institute-PMP Professional Development Units.

This course presents practical concepts and techniques for using a commonly available, but often-misused, management tool to reduce the time spent on planning and increase the time available to manage the project. The course is based on PM processes, not on software features, so students learn how to effectively leverage the tool during all phases of project management, from requirements analysis, detailed planning, and tracking/implementation to close-out. Topics include preplanning activities, defining tasks and resources, resource leveling, schedule optimization, establishing buy-in, tracking actual data, multiple projects and users, resource pooling, customizing the software, and valuable add-on tools. No software programming experience is required.

Prerequisite(s): "Role of the Project Manager."

OLIVER GILDERSLEEVE, M.S.E.E., PMP®

LAB WITH ONLINE MATERIALS 2 meetings | 8:30 am—5 pm | August 12—19 Fee: \$720.

Section Number 4556.(077)

# Managing the Development of New Products

BUSAD.X450.7 (1.5 quarter units) Professional Credit: Project Management Institute–PMP Professional Development Units 15 hours.

Learn the best practices that project managers use worldwide to get results in half the time and half the cost. This course addresses the root problem and demonstrates proven techniques to create product visions, build effective teams, make wise cost-benefit-risk trade-offs, 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, and biotech.

Prerequisite(s): "Role of the Project Manager."

ERIC HEILMANN, B.S., M.S., M.B.A.

ONLINE | June 20–July 25 Fee: \$720.

Section Number 3196.(063)



### ENROLL **EARLY!**

Enroll at least seven days prior to your course's start date to save your seat and allow time to prepare for the first class meeting. Enrolling early also helps ensure that your course is not cancelled due to low enrollment.

# Technical Writing and Communication

### CERTIFICATE PROGRAM

### Technical Writing and Communication

### PROGRAM SUMMARY

Technical communicators work in a variety of fields, and professionals must expand their skills to keep pace with the needs of the world's most innovative companies. Whether addressing advanced topics or grammar basics, our comprehensive program centered around information usability educates superb technical communicators at all levels in all technical disciplines.

Our program is structured into five categories of courses, each catering to a different need and expertise within the professional community:

- Technical Communication Fundamentals
- Advanced Topics in Communication
- Project Leadership
- Tools and Technologies
- Engineering Communication

Take individual courses to expand or update specific skills, or pursue the certificate for comprehensive instruction from the professionals who helped define the profession in Silicon Valley.

#### AUDIENCE

- Information developers, engineers and architects
- Career changers
- Documentation project leads
- · Engineering managers
- Technical writers, editors and communicators
- User experience architects and designers
- Usability engineers
- Visual designers

### CERTIFICATE REQUIREMENTS

- Total of 10 courses
- -Seven required courses
- -Three elective courses
- Overall GPA of 3.0
- 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

### RECOMMENDED COURSE SEQUENCE

- It is strongly recommended that you start with "Technical Communication: An Introduction to the Profession."
- You must end with "Final Project: Preparing Your Job Search."

### PROGRAM CHAIR



ANDREA AMES, M.S., is a senior technical staff member (STSM) and information experience strategist and architect at IBM. She has taught for UCSC Extension since 1998. She specializes in user-centered information usability, strategy, architecture and design. Ms. Ames' specialty is architecting and designing information for software user interfaces—such as labels, embedded instructional text, and hover help—and making the interfaces deploying that information as easy to explain as possible before developing traditional documentation. She teaches at the university level and is in demand as a conference speaker internationally. She is a fellow and past president (2004–05) of the Society for Technical Communication and a distinguished engineer of the Association for Computing Machinery.



### Required Courses

### Grammar and Style for Technical Communicators

WRIT.X403.9 (3.0 quarter units)

This course provides an intensive review of modern English grammar, style, and punctuation, and examines how these subjects pertain to current technical writing. We review parts of speech, clauses, phrases, subjects, and predicates; discuss sentence patterns, forms, and voice; and review sentence errors such as comma splices, fragments, pronoun and verb agreement, and dangling and misplaced modifiers. This course also examines wordiness, parallelism, and word choice.

MICHELLE CORBIN, B.A., M.S.

ONLINE | June 19–September 11

Fee: \$735.

Section Number 4360.(053)

# Writing Successful Instructions, Procedures and Policies

WRIT.X404.9 (1.5 quarter units)

This course focuses on the role of the writer in eliciting software requirements supporting iterative development; creating step-by-step instructions suitable for user guides; and writing policies, processes, and procedures for corporate governance. Students will download lecture notes, join discussions, take quizzes, and write in these genres.

JONATHAN PRICE, D.F.A.

ONLINE | June 4–July 17

Fee: \$670.

Section Number 1931.(023)

### **Elective Courses**

### **Content Management**

BUSAD.X466.2 (1.5 quarter units)

In this course, you will learn how to decide whether your organization needs content management, what content management might do for you, and what challenges you could face in moving from a document-centric world to a complex interactive system alive with content. Topics include content inventory, personalization and customization, best tools, social networks, and collaborative environments.

JONATHAN PRICE, D.F.A.

ONLINE | July 17-August 28

Fee: \$630.

Section Number 6117.(026)



### TECHNICAL WRITING AND COMMUNICATION CERTIFICATE

### Not unit-specific

ot unit-specific	
REQUIRED COURSES	Units
Technical Communication Fundamentals	
Technical Communication: An Introduction to the Profession	1.5
Grammar and Style for Technical Communicators	3.0
Technical Writers' Workshop	
Writing Successful Instructions, Procedures and Policies	
Developing Technical Information from Plan to Completion	2.0
Advanced Topics in Communications	
Information Architecture and Design Basics	1.5
Final Project: Preparing Your Job Search	1.5
ELECTIVE COURSES (Choose three)	Units
Building and Maintaining Your Technical Eminence	2.0
Content Management	1.0
DITA Authoring, Introduction	2.0
DITA Information Architecture	1.5
DITA Information Architecture	1.5 2.0
DITA Information Architecture	1.5 2.0 2.0
DITA Information Architecture	

Certificate schedule outline of program curriculum and annual schedule are found online. From the homepage, select: "Area of Study"; department; then certificate title as listed above.

### Managing Technical **Documentation Projects**

BUSAD.X408.2 (1.0 quarter 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; and schedules to meet due dates and control costs. In addition, students learn to track and close out projects and manage documentation projects in Agile environments.

TIM BOMBOSCH, Ph.D.

ONLINE | May 23-July 4

Fee: \$580.

Section Number 1025.(043)

### Role of the Project Manager

For course description, see page 40.

### XML for the Rest of Us

BUSAD.X481.3 (1.0 quarter units)

In this course, you'll learn why XML has become a key standard on the Web, how it changes the way you write, and how XML tags take your text through a maze of software between your desk and the user. The course covers using a parser to monitor the tags you write and ensure accuracy, check the structure of your document, and make sure it matches a standard defined in a Document Type Definition or Schema. You'll learn how to author an XML document, start and end a tag, write names correctly, enter values, and place the actual content. Through a series of exercises, students learn to create all the components of an XML document, including a prolog with an XML declaration, comments and processing instructions, and a body with elements, attributes, and entity references. By the end of the course, you will have several short XML documents and one complex XML document to use in your portfolio.

Prerequisite(s): You do not need to know programming of any kind.

JONATHAN PRICE, D.F.A.

ONLINE | July 17-August 14

Fee: \$580.

Section Number 3560.(014)





### ACCESS TO **ONLINE COURSES** AND MATERIALS



If you are enrolling for the first time in an Online course, or a classroom course with Online Materials, you will receive an account for UCSC Extension Online via email within 12 hours. If you have previously taken a course with online materials, you should use your existing account. Course sites will open one day prior to the official start date.

For more information, including help retrieving your account info, please visit ucsc-extension.edu/online-faqs.

For information on textbooks, see page 92 or visit ucsc-extension.edu/bookstore.

# Education Education

WHAT STUDENTS SAY:

"UCSC Extension was the best place for me to pursue my education."



### ANGELA ALCANTARA-CRUZ

Early Childhood Education

After graduating from UCSC with a degree in sociology, Angela Alcantara-Cruz earned a master's in organizational development and led a successful 20-year career in business operations in the semiconductor industry. She felt her career start to shift after becoming a parent and coping with some health issues. The pace and stress of her Silicon Valley job began to lose its appeal, and after investigating her options, she decided to enroll in UCSC Extension's Early Childhood Education certificate program. The experience helped her realize her ultimate goal: to create her own after-school enrichment program for children.

"I really like working with kids," she says. "When I got sick, I decided to quit my semiconductor career. At the time I was volunteering at a local preschool, and I realized that when I was working with kids, I didn't feel sick. The kids gave me so much joy that I felt like I was getting better as I was spending time with them."

### Transformative Learning

At UCSC Extension, Alcantara-Cruz learned valuable skills that were transferrable to the classroom, especially in her "ECE: Creative Arts for the Young Child (Preschool through Grade 3)" course.

"That class has made me stop and think through how to talk to my children, as well as the kids at my school," she says. "It's not just about art; this philosophy extends to other facets of children's lives."

### First-Hand Experience

As part of her certificate program, Alcantara-Cruz completed a practicum and gained first-hand experience in the classroom.

"For my practicum, I volunteered over 150 hours at my daughter's preschool," she says. "It was interesting volunteering there while I was taking classes, because I took mental note of things that I would modify or adapt. I definitely thought it was a great experience to be in that environment, gaining experience. I now work there as a substitute teacher. While someday I want to run my own program, working at this school has been a great way to gain experience."

Tell Us Your Story

We'd love to hear how you applied new skills in the workplace, or how your new credentials led to exciting job opportunities. Share your latest achievements by submitting your Extension story to extensionfeedback@ucsc.edu.

### **SB 2042 CREDENTIALS**

SB 2042 Preliminary—Healthy Environments, Special Populations, Technology

UCSC Silicon Valley Extension offers CCTC-approved courses to meet selected standards for SB 2042 Teacher Preparation and Teacher Induction.

### **UCSC Extension Courses**

### **Notes**

Becoming a Professional Educator
XSC2652
UCSC SB 2042

5 units: Teacher Preparation Standards 10 and 14. Combines special populations (mainstreaming) and supportive, healthy environments (health ed). Does not include CPR.

Introduction to Technology in Schools XSC209

2 units: Approved by the commission for SB 2042 Teacher Preparation Standard 11.

For information and guidance, contact the Education Department at (408) 861-3860 or email extensionprogram@ucsc.edu.

- 1. California Commission on Teacher Credentialing. See www.ctc.ca.gov.
- 2. To satisfy the Mainstreaming and Health Education requirements, the Education Department offers a combined course approved by the CCTC: "Becoming a Professional Educator: Special Populations and Healthy Environments" (Course Number 4317).

### CERTIFICATION

### Credential Courses

### COURSES FOR CLEARING PRELIMINARY CREDENTIAL

UCSC Extension offers programs for educators seeking to meet selected teacher preparation requirements for the SB 2042 Preliminary credential. Many of our credential courses are offered online for the convenience of professional educators. Please confirm with the administrator of your credential program that the course you intend to take is acceptable.

#### PROGRAM CHAIR



VIVIAN RHONE-LAY, Ph.D., has been an educator for over ten years. During that time, she has worked in many roles, including teaching, academic counseling, university admissions, higher education management, program development, educational software development, and educational research. Dr. Rhone-Lay has experience with peer-evaluation in teaching, and supervising and supporting colleagues within the K-12 and university settings. Her publications and conference presentations have addressed issues such as teacher preparation and school-based initial training, accountability in schools, professional identities, supporting immigrant learners and disadvantaged students, and topics in comparative education, among others.

### SPECIAL OFFERING

### Introduction to the Common Core State Standards (K-12): What Counts as Common Core?

EDUC.X391 (1.5 quarter units)

As school districts throughout the country transition to the Common Core Standards, it is critical that teachers learn an entirely new way of presenting and assessing their subject matter. This course explains the differences between the California 1997 State Standards (97s) and the Common Core State Standards (2010), including what constitutes Common Core lessons and assessments, under what conditions, for what outcomes and according to whom. You will learn how to use online and paper-based tools for curriculum development and collaborative planning with other teachers. Your grade will be based on quizzes, article summaries, reflections, lesson plans, mockup assessments, and class participation.

VIVIAN RHONE-LAY, Ph.D.

CLASSROOM AND ONLINE (HYBRID) 3 meetings | 6–8:30 pm, June 1–15. Fee: \$295.

Section Number 30278.(006)

### EDUCATION

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### Becoming a Professional Educator: Special Populations and Healthy Environments

EDUC.XSC265. (5.0 quarter units)

Meets the California Commission on Teacher Credentialing requirements in (a) healthy environment and special populations for SB 2042 preliminary Multiple or Single Subject. On the path to your SB 2042 Multiple or Single Subject teaching credential? This course will train you in the best practices for creating and maintaining a healthy and positive learning environment for all learners. It offers an overview of the Individualized Education Program (IEP) and the expanded role of the teacher in developing literacy across content areas and fostering social-emotional development. By the end of the course, you'll be able to perform essential teaching tasks such as designing learning experiences and creating effective social environments for student learning.

VIVIAN RHONE-LAY, Ph.D.

ONLINE | June 29–August 26 Enrollment accepted through July 16 Fee: \$915.

Section Number 4317.(085)

# Technology in Schools, Introduction (SB 2042 Standard 11)

EDUC.XSC 209 (2.0 quarter units)

This course meets the SB 2042 Level 1 technology requirement (Standard 11) for teacher preparation. This course meets the SB 2042 Level 1 technology requirement (Standard 11) for teacher preparation. The course prepares K-12 teacher candidates to use appropriate technology to facilitate the teaching and learning process. You'll learn to leverage multiple modalities to communicate with students, parents, colleagues and administration; design technology-integrated instructional activities; gain insight into related legal and ethical issues; and practice using a variety of technology for instruction and assessment. By the end of the course, you'll have a toolkit of technology resources and strategies you can use in your classroom.

NATALIE BERNASCONI, Ed.D.

ONLINE | June 19–July 21

Fee: \$370.

Section Number 23388.(031)

# Early Childhood Education

### CERTIFICATE PROGRAM

### Early Childhood Education

### PROGRAM SUMMARY

The Early Childhood Education (ECE) program at UCSC Extension prepares preschool teachers and operators to manage the unique challenges they face in our region. Whether preparing to become the director of a day-care center or a teacher in one, our ECE program provides a full range of University of California-certified course work to meet the needs and requirements of two levels of expertise.

Our entry-level ECE program provides all the training and background needed to understand child growth and development, strategies for effective classroom teaching, developmentally based curriculum, and current research and trends.

Our instructors are among the top teachers and administrators of Early Childhood Education in the greater Bay Area. As a result, our students network with career professionals and educational leaders in early childhood education and day-care service, while acquiring University of California-certified training.

### CERTIFICATE REQUIREMENTS

To obtain the Certificate in Early Childhood Education, you must successfully complete **32 units of required courses** and **3 units of electives**.

### **PREREQUISITES**

Enrollment for "ECE 7" requires the completion of "ECE 1," "ECE 3" and "ECE 4."

#### PROGRAM CO-CHAIRS



MELISSA LE, B.A., Multi-Subject Teaching Credential, has more than 23 years of experience working with children from infants to preschool-age students, and in K-6 classrooms. Ms. Le has worked in public and private school settings, and examined a variety of learning programs such as Challenger, Montessori, High Scope, college-run preschools at DeAnza, San José State University, and Stanford, to name a few. She has also supervised K-6 after-school programs, where she developed lesson plans and curriculum to meet the needs of diverse populations and students with special needs. Ms. Le has extensive experience mentoring emerging teachers in the SJSU and Stanford student-teacher programs, as well as beginning teachers completing their two year BTSA programs. Ms. Le's expertise is in identifying the needs of her students, both children and adults, and helping them to reach their full potential.

JUANITA CAMPBELL-RODRIGUEZ, M.Ed., M.A., M.A.T., has been an educator for over 15 years. Mrs. Campbell-Rodriguez has a B.A. from the University of San Diego, a Master of Education with a specialization in Cross-Cultural Teaching, a Master of Arts in English, and a Master of Arts in Teaching with a specialization in early childhood education. Additionally, she has a Professional Clear Teaching Credential with a CLAD and Gifted and Talented Education (GATE) certification. Mrs. Campbell-Rodriguez has worked as a classroom teacher, program chair, college professor, mentor, course designer, and faculty trainer in pre K-12 through college environments. She enjoys helping teachers develop their instructional programs to meet the needs of a diverse student population. She is pursuing a doctorate of education in leadership with a specialization in curriculum, instruction, and assessment, and is working on her first children's book.





### **EARLY CHILDHOOD EDUCATION CERTIFICATE**

#### 35-unit minimum

ECE CERTIFICATE REQUIRED COURSES	Units
ECE 1: Development in Early Childhood  ECE 2: Introduction to Teaching Young Children	4.0
ECE 2: Introduction to Teaching Young Children	3.0
ECE 3: Curriculum Development in Early Childhood Programs	4.0
ECE 4: The Young Child in the Family and Community	
ECE 5: Positive Guidance and Discipline for the Young Child	3.0
ECE 6: Culture and Diversity in the Early Childhood Classroom	3.0
ECE 7: Practicum in Early Childhood Education	5.0
ECE 8: Child Health, Safety and Nutrition	3.0
ECE 9: Language and Literacy for the Young Child	3.0
ELECTIVE COURSES (three units)	Units
Attention Deficit Hyperactivity Disorder (ADHD) in the Classroom	3.0
Differentiated Learning	1.5
ECE: Brain Development in Early Childhood	1.0
ECE: CPR and First Aid	0.0
ECE: Creative Arts for the Young Child (Preschool Through Grade 3)	3.0
ECE: Infant/Toddler Growth and Development	2.0
ECE: Principles of Infant/Toddler Caregiving	2.0
Math Development in Young Children	2.0
Science Play: Inquiry-Based Learning Made Easy	1.0
Introduction to the Common Core State Standards (K-12):	
What Counts as Common Core?	1.5

Certificate schedule outline of program curriculum and annual schedule are found online. From the homepage, select: "Area of Study"; department; then certificate title as listed above.

### Required Courses

### ECE 1: Development in Early Childhood

EDUC.X305.40 (4.0 quarter units)

In this course, you'll explore human development from prenatal stages through middle childhood and study the interrelationships among social, emotional, physical and cognitive development, focusing on the role of play in early childhood. Using observational techniques, the course identifies developmentally appropriate characteristics and activities.

MELISSA LE, B.A., Multi-Subject Teaching Credential

CLASSROOM WITH ONLINE MATERIALS 4 meetings | 9 am-3 pm | June 24–July 29 Fee: \$510.

Section Number 1185.(054)

# ECE 4: The Young Child in the Family and Community

EDUC.X346.16 (4.0 quarter 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. You'll explore ways to develop communication skills between young children and peer groups, parents and teachers. The course also reviews community resources and social services, including healthcare, welfare and counseling.

JUANITA CAMPBELL-RODRIGUEZ, M.A.T., M.Ed.

ONLINE | June 13—July 30 Fee: \$510.

Section Number 6482.(044)

# INFO

### Early Childhood Education



This free evening event provides a short overview of the five Education certificate programs for new or returning students. Education department staff and instructors will be available to answer individual questions and recommend course sequences. You'll also have the opportunity to network with fellow students and discuss career options for educators in various fields. We encourage you to enroll early to reserve your space.

#### CLASSROOM

1 meeting | 6:30–8:30 pm | August 23 No fee, but enrollment is required. **Section Number 23594.(019)** 

### **ENROLL EARLY!**

Enroll at least seven days prior to your course's start date to save your seat and allow time to prepare for the first class meeting. Enrolling early also helps ensure that your course is not cancelled due to low enrollment.

# ECE 5: Positive Guidance and Discipline for the Young Child

EDUC.X343.34 (3.0 quarter units)

In this course, you'll learn to identify children's behavior to determine whether it is normal, developmentally appropriate or problematic. You'll also explore cooperative discipline in the wider context of classroom management, working with staff and parents. The course examines behaviors and offers practical approaches for preventing certain behaviors and guiding children through the use of positive discipline. The course focuses on how an adult can behave when a difficult situation arises and be as effective as possible.

MELISSA LE, B.A., Multi-Subject Teaching Credential

CLASSROOM AND ONLINE (HYBRID)

5 meetings | 5:30–8:30 pm | July 31–August 28 Fee: \$470.

Section Number 2529.(041)

### ECE 8: Child Health, Safety and Nutrition

EDUC.X300.151 (3.0 quarter 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.

NINET MORADI, M.A.

ONLINE | July 17-August 27

Fee: \$470.

Section Number 23240.(014)

# ECE 9: Language and Literacy for the Young Child

EDUC.X300.143 (3.0 quarter 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. There will also be a review of the reading process, along with various reading theories and issues.

JUANITA CAMPBELL-RODRIGUEZ, M.A.T., M.Ed.

ONLINE | May 16-June 25

Fee: \$470.

Section Number 23230.(013)

# View each courses' full schedule online at ucsc-extension.edu

### **Elective Courses**

# Attention Deficit Hyperactivity Disorder (ADHD) in the Classroom

EDUC.X361.30 (3.0 quarter 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.

ERIN POWERS, M.Ed., BCET

CLASSROOM AND ONLINE (HYBRID) 6 meetings | 6–9 pm | June 16, July 7, 21; and 9 am–5 pm | June 17, July 8, 22 Fee: \$360.

Section Number 1004.(023)

### **ECE: CPR and First Aid**

EDUC.812 (0.0 quarter units) Professional Credit: CPR Certification

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.

CRITICAL MOMENTS, LLC

CLASSROOM

1 meeting | 9 am-5 pm | August 5

Fee: \$85.

Section Number 30243.(008)

# ECE: Creative Arts for the Young Child (Preschool Through Grade 3)

EDUC.X305.41 (3.0 quarter units)

Can you make the most of your teaching with art? How can you organize lessons that inspire your students? This course reviews art expression at each early childhood development stage and explores ways to foster creativity and the creative process. You'll work hands-on with art processes such as painting, modeling, and weaving. Through mini-lectures, discussions, videos, and readings, you'll prepare age-appropriate lessons that build visual and spatial awareness and relate art to science, mathematics, language arts, and social studies. You'll create an individualized portfolio, complete with lesson plans and objectives.

MELISSA LE, B.A., Multi-Subject Teaching Credential

CLASSROOM AND ONLINE (HYBRID)
3 meetings | 9:30 am-4:30 pm | August 12-26
Fee: \$360.

Section Number 0077.(025)

### Science Play: Inquiry-Based Learning Made Easy

EDUC.X308.31 (1.0 quarter units)

Young children are 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 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 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.

ROBYN STONE, M.A.

CLASSROOM AND ONLINE (HYBRID) 2 meetings | 6–9 pm | June 22–July 20 Fee: \$200.

Section Number 5741.(014)



### CERTIFICATE PROGRAM

### Early Childhood Education: Supervision and Administration

### PROGRAM SUMMARY

In California, prospective directors of child-care centers require specialized training in administration and supervision to qualify for licensing. Once licensed, they also require ongoing professional development to renew permits.

The ECE Supervision and Administration Certificate program at UCSC Extension provides comprehensive preparation for this role. It is designed specifically for child-care professionals who aspire to run child-care centers. The curriculum delivers targeted instruction in budget administration, facilities management, and personnel recruitment and supervision.

Educators or working professionals interested in exploring careers as directors of private child-care centers will benefit from this program, as will parents interested in learning more about ECE administration.

### CERTIFICATE REQUIREMENTS

To earn the Certificate in Supervision and Administration of Early Childhood Centers, you must first successfully complete the Certificate in Early Childhood Education or its equivalent, followed by 12 units of required courses and 6 units of ECE electives.

### RECOMMENDED COURSE SEQUENCE

ECE 11 should be taken before ECE 12.

### PREREQUISITES

You must complete the Certificate in Early Childhood Education or equivalent before enrolling for these courses.

# EARLY CHILDHOOD EDUCATION: SUPERVISION AND ADMINISTRATION CERTIFICATE

### 18-unit minimum

	REQUIRED COURSES	Units
	ECE 10: Supervision and Administration: Parents as Partners in Education ECE 11: Supervision and Administration of Early Childhood Centers, Part A	
	ECE 12: Supervision and Administration of Early Childhood Centers, Part B	3.0
	ECE 13: Supervision and Administration: Adult Supervision and Mentoring	3.0
_	ELECTIVE COURSES (six units)	Units
	Attention Deficit Hyperactivity Disorder (ADHD) in the Classroom	
	Differentiated Learning	1.5
	ECE: Brain Development in Early Childhood	1.0
	ECE: CPR and First Aid	
	ECE: Creative Arts for the Young Child (Preschool Through Grade 3)	
	ECE: Infant/Toddler Growth and Development	
	ECE: Principles of Infant/Toddler Caregiving	
	Math Development in Young Children	
	Science Play: Inquiry-Based Learning Made Easy	
	Introduction to the Common Core State Standards (K-12):	-
	What Counts as Common Core?	1.5

Certificate schedule outline of program curriculum and annual schedule are found online. From the homepage, select: "Area of Study"; department; then certificate title as listed above.



# ENERGIZE YOUR TEACHING



UCSC Silicon Valley Extension offers programs for educators who wish to meet credential requirements and strengthen their teaching with new ideas and skills. Thousands of Bay Area teachers list our certificates on their résumés, advance on district salary schedules by earning academic units, clear their credentials with course work, and apply the latest innovations in their classrooms.

### BROAD CURRICULUM FOR PROFESSIONAL EDUCATORS

Professional educators will find training in a variety of curricular areas at UCSC Silicon Valley Extension, including reading methods, mainstreaming, technology in education, and online instruction. We also offer credential courses approved by the California Commission on Teacher Credentialing (CCTC) and the UCSC Education Department.

### ACADEMIC UNITS AND SALARY INCREASES

Extension courses numbered X300 through X399 are designated as professional courses in education. Courses in this series have been approved by the Education Department on the UCSC campus and, when required, approved by the California Commission on Teacher Credentialing (CCTC). Courses with XSC numbers are UCSC courses.

### **COURSE SUBSTITUTIONS**

If you have taken professional development courses within the past five years, you may be able to substitute one course in which you have received a grade of B or above. You are only able to substitute one course toward any Education Certificate.

### ATTENTION SCIENCE TEACHERS

Let UCSC Extension's science courses help you bring cutting-edge science into your classroom and expand your knowledge of the ever-changing life sciences field. See the Biosciences section, page 10.

### Required Courses

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

EDUC.X343.29A (3.0 quarter 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.

NINET MORADI, M.A.

ONLINE | May 15–June 18

Fee: \$470.

Section Number 6290.(031)

### ECE 12: S/A of Early Childhood Centers, Part B

EDUC.X343.29B (3.0 quarter units)

This course explores the challenges and issues related to the supervision and operation of preschool programs. You'll also discuss staff-administrator relationships, staff in-service education and how to work with parents.

NINET MORADI, M.A.

ONLINE | June 19–July 23

Fee: \$470.

Section Number 3655.(027)

### ECE 13: S/A Adult Supervision and Mentoring

EDUC.X343.30 (3.0 quarter 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.

ROBYN STONE, M.A.

ONLINE | July 24-August 27

Fee: \$470.

Section Number 5956.(026)

### **Elective Courses**

# Attention Deficit Hyperactivity Disorder (ADHD) in the Classroom

For course description, see page 48.

### **ECE: CPR and First Aid**

For course description, see page 48.

# ECE: Creative Arts for the Young Child (Preschool Through Grade 3)

For course description, see page 48.

### Science Play: Inquiry-Based Learning Made Easy

For course description, see page 48.





# **Educational Therapy**

### CERTIFICATE PROGRAM

# Educational Therapy



### PROGRAM SUMMARY

In this program, you will learn how to work with young children, adolescents and adults who struggle with learning problems, and gain the latest instructional techniques and strategies in special education. The program covers administration and support of individual education plans, data collection and reporting, state and federal laws, and communication and family involvement. You will be trained in the most current and innovative approaches to providing resources and support for parents, guardians, and families of children with disabilities.

Our Educational Therapy program thoroughly prepares educational specialists and tutors to serve students with special needs, emphasizing practical application and experience. Our course work is in accordance with the Association of Educational Therapists' requirements and culminates in an internship. Students who have established candidacy for the full certificate are encouraged to apply for an AET associate level membership.

### **CERTIFICATE REQUIREMENTS**

To obtain the Certificate in Educational Therapy, you must successfully complete **26 units of required courses**, and **4 units of elective courses**. You must attain an overall average GPA of 3.0 to qualify.

As you make your way through the courses and internship, you will compile a portfolio for review by the program chair.

### TO QUALIFY AS A CERTIFIED EDUCATIONAL THERAPIST

The Certificate in Educational Therapy issued by UCSC Extension is an important step. However, there are additional requirements to qualify as a professional member in the Association of Educational Therapists (AET), as well as more requirements to qualify as a Certified Educational Therapist with AET.



To learn more about the requirements, call (818) 843-1183 or visit www.aetonline.org

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Note: This certificate is not intended to meet the requirements for adult and vocational education credentials issued by the State of California. For information, consult the California Commission on Teacher Credentialing at www.ctc.ca.gov.



### **EDUCATIONAL THERAPY CERTIFICATE**

#### 30-unit minimum

REQUIRED COURSES	Units
Educational Therapy: Reading I	3.0
Principles of Educational Therapy	3.0
Strategies for Learning Differences in Mathematics	3.0
Assessment for Educational Therapists—Using Formal and Informal Approaches	3.0
Assessment for Educational Therapists Practicum	3.0
Techniques of Educational Therapy: Affective, Cognitive and Perceptual Elements	3.0
Management of Clinical Practice	3.0
Practicum in Educational Therapy	
••	
ELECTIVE COURSES (four units)	Units

ELECTIVE COURSES (four units)	Units
Attention Deficit Hyperactivity Disorder (ADHD) in the Classroom	3.0
Differentiated Learning	
Understanding Learning Differences	3.0
Psychology of Human Learning	2.0
ECE: Managing Behaviors That Are Challenging	2.0
ECE: Brain Development in Early Childhood	1.0

Certificate schedule outline of program curriculum and annual schedule are found online. From the homepage, select: "Area of Study"; department; then certificate title as listed above.

### PROGRAM CHAIR



SHARMILA ROY, Ph.D., has over 27 years of experience in education; primarily in teaching, teacher training, program development, educational therapy, classroom interventions, and curriculum development for special education. Dr. Roy is the co-founder and director of MyndFlex, a nonprofit after-school program. At MyndFlex, Dr. Roy supervises therapists and interns who specialize in the areas of cognition, attention, learning, study skills and organization, and socioemotional skills. She has extensive experience working one-on-one with exceptional students, facilitating in-service seminars for teachers.

### Required Courses

### Assessment for Educational Therapists, Practicum

EDUC.X347.15 (3.0 quarter 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.

Prerequisite(s): "Assessment for Educational Therapists—Using Formal and Informal Approaches."

DEBORAH CRIM, M.S., BCET

CLASSROOM WITH ONLINE MATERIALS
5 meetings | 9 am—4 pm | July 15—August 12
Fee: \$590

Section Number 4217.(034)

# INFO

### Educational Therapy



This free evening event provides a short overview of the five Education certificate programs for new or returning students. Education department staff and instructors will be available to answer individual questions and recommend course sequences. You'll also have the opportunity to network with fellow students and discuss career options for educators

in various fields. We encourage you to enroll early to reserve your space.

CLASSROOM

1 meeting | 6:30–8:30 pm | August 23 No fee, but enrollment is required.

Section Number 0726.(078)

# ACCESS TO ONLINE COURSES AND MATERIALS



If you are enrolling for the first time in an Online course, or a classroom course with Online Materials, you will receive an account for UCSC Extension Online via email within 12 hours. If you have previously taken a course with online materials, you should use your existing account. Course sites will open one day prior to the official start date.

For more information, including help retrieving your account info, please visit ucsc-extension.edu/online-faqs.

For information on textbooks, see page 92 or visit **ucsc-extension.edu/bookstore.** 

### Elective Courses

# Attention Deficit Hyperactivity Disorder (ADHD) in the Classroom

For course description, see page 48.

### Management of Clinical Practice

EDUC.X347.12 (3.0 quarter units)

Establishing and operating a successful private practice can be a challenging process for those entering the field of educational therapy. This course fosters the confidence that comes with knowledge of basic business practices. Topics include the development of a business plan, office procedures, record-keeping, insurance requirements, fee structures, public relations, advertising, time management, and community involvement.

SHARMILA ROY, PH.D.

ONLINE | July 17-September 3

Fee: \$590

Section Number 4615.(030)

### **Practicum in Educational Therapy**

EDUC.X347.18 (5.0 quarter 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.

SHARMILA ROY, PH.D.

FIELD STUDY/PRACTICUM

4 meetings | 9 am-12 pm | July 29—December 9

Fee: \$865

Section Number 6361.(061)

### Psychology of Human Learning

EDUC.X347.10 (2.0 quarter 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.

MICHAELA DE SAPIO-YAZAR, M.S.

ONLINE | May 22-June 25

Fee: \$415.

**Section Number 3536.(041)** 

### **Understanding Learning Differences**

EDUC.X347.9 (3.0 quarter 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.

SHARMILA ROY, PH.D. ERIN POWERS, M.Ed., BCET

ONLINE | June 13-July 30

Fee: \$590

Section Number 0384.(041)



# Instructional Design and Delivery

### **CERTIFICATE PROGRAM**

# Instructional Design and Delivery

### PROGRAM SUMMARY

This program will develop your capacity to organize and deliver learning using methods that take into account learner needs, learning styles, organizational goals and effective evaluation practices. The principles and practices apply in traditional settings ranging from K-12 classrooms to colleges and universities, as well as professional training settings in corporations and government.

The certificate is recommended for K-12 teachers and subject-matter experts, current and future adult educators in university, community college, preparatory school, and adult education settings; and government and business trainers, consultants, and human resource professionals.

Instructors model the best of instructional design, starting with assessments of each participant's needs, and then coach toward the next developmental stage. Instructors work from the premise that each participant will develop or expand existing skills, building on natural talents and strengths. Assessments reveal areas in need of special attention, such as facilitating group discussions or setting up company-wide evaluation schemes. Throughout the program, participants build practical approaches to online learning, facilitation, the use of emerging technologies, intercultural communication, and the evaluation of curriculum and training vendors.

Note: This certificate is not intended to meet the requirements for adult and vocational education credentials issued by the State of California. For information, consult the California Commission on Teacher Credentialing at www.ctc.ca.gov.

### CERTIFICATE REQUIREMENTS

To obtain the Certificate in Instructional Design and Delivery, you must successfully complete 6 units of required courses and 8 units of elective courses.

### RECOMMENDED COURSE SEQUENCE

"Introduction to Instructional Design and Delivery" should be in the first quarter of your program.

"Practicum—Instructional Design and Delivery" should be taken in the final quarter of your program.

# INSTRUCTIONAL DESIGN AND DELIVERY CERTIFICATE

#### 14-unit minimum

PEOUPER COURSES (Six units)	llu:ta
REQUIRED COURSES (six units)	Units
Instructional Design and Delivery, Introduction	1.0
Learning Theories and Styles	1.0
Cultural Proficiency	2.0
Practicum—Instructional Design and Delivery	2.0
<b>3</b>	
ELECTIVE COURSES (eight units)	Units
Online Instruction	
Introduction to Online Teaching	2.0
Ruilding Online Learning Communities	2.0
Building Online Learning Communities  Designing Online Instruction	2.0
Designing Online instruction	2.0
Instructional Design for Corporate Trainers	
Facilitation Skills	2.0
Designing Training Programs	2.0
Instructional Needs Assessment and Evaluation	
Improving Your Business Presentation Skills	2.0
Role of the Project Manager	1.5

Certificate schedule outline of program curriculum and annual schedule are found online. From the homepage, select: "Area of Study"; department; then certificate title as listed above.



### PROGRAM CO-CHAIR

ALAN TSUDA, M.B.A., Yale University, has taught for UCSC Extension in the Project Management and Instructional Design programs since 1999. He has over 15 years of industry experience as a consultant in technology and corporate training and is the founder of ResultWorks, a Silicon Valley consultant firm. A veteran of the computer and tech industries, Mr. Tsuda specializes in the application of technology to learning. As a consultant, he focuses on helping clients learn. Mr. Tsuda has assisted with the development of technical training programs for two consulting firms, and served on advisory boards for curriculum review and program redesign projects at UCSC Extension and UC Berkeley Extension. He has worked with many current and emerging instructors at UCSC Extension, some of whom have become colleagues and collaborators in developing and delivering instruction.



### PROGRAM CO-CHAIR

HOLLY CORNELISON HOPLA, M.Ed., has worked in public and private institutions for over two decades as an instructor, teacher trainer, curriculum developer, and program manager. Ms. Cornelison Hopla holds Single and Multiple Subject teaching credentials in California, and her credentials in Washington are endorsed in English Language Arts and English Language Learners. She has also earned certificates in both Instructional Design and Delivery and Online Teaching through UCSC Extension. She taught elementary school, high school and continuing education in top performing schools in California and Washington. As a master teacher, she has mentored new teachers in the classroom, helping them to develop their craft as instructors and classroom managers. As a consultant for her academic coaching business, Holly Hopla, Educational Coaching, LLC, she supports students with academic needs such as organization, motivation, advocacy, and self-confidence.

# INFO

### Instructional Design and Delivery



This orientation session introduces our certificate programs in online teaching and instructional design and delivery. This session will benefit anyone seeking ways to create meaningful instruction, effectively manage courses, and develop appropriate methods of assessing students in an online environment. The event provides an opportunity to network with students from other Education programs.

### CLASSROOM

1 meeting | 6:30–8:30 pm | August 23 No fee, but enrollment is required.

Section Number 23236.(021)

# ACCESS TO ONLINE COURSES AND MATERIALS



If you are enrolling for the first time in an Online course, or a classroom course with Online Materials, you will receive an account for UCSC Extension Online via email within 12 hours. If you have previously taken a course with online materials, you should use your existing account. Course sites will open one day prior to the official start date.

For more information, including help retrieving your account info, please visit **ucsc-extension.edu/online-faqs.** 

For information on textbooks, see page 92 or visit **ucsc-extension.edu/bookstore.** 

### Required Courses

### **Cultural Proficiency**

CMMU.X403.1 (2.0 quarter units)

Because an increasing number of companies have an international workforce, staffers and managers must be culturally proficient; they need to recognize diverse communication styles to best collaborate. This interactive course applies the latest research to intercultural business activities. You'll explore studies in competition and teamwork, feedback and clarification, appraisal and motivation, optimal time use, coaching employees through cultural transitions, and strategic use of cultural resources. By the course's conclusion, you'll understand the difference between workplace politics and diplomacy; differentiate between communication styles and start a plan for communicating more effectively.

HOLLY CORNELISON HOPLA, M.Ed.

ONLINE | July 20-August 27 Fee: \$535.

Section Number 6475.(027)

### Instructional Design and Delivery, Introduction

EDUC.X300.070 (1.0 quarter units)

Instructional designers must integrate expected outcomes with knowledge of adult-learning theories, learning styles, and student needs. What should 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? What will students do as they engage in instructor-led or self-paced sessions? This course allows you to practice face-to-face delivery, delivery through remote channels, balancing instructor and student activity, and matching activities to expected outcomes.

ALAN TSUDA, M.B.A.

CLASSROOM AND ONLINE (HYBRID) 2 meetings | 6:30-9:30 pm | June 19-July 17 Fee: \$460.

Section Number 30396.(026)

### Learning Theories and Styles

BUSAD.X444.5 (1.0 quarter units)

This seminar for training and learning professionals covers adult learning theories and styles, and encourages you to explore your own learning style/preferences through instruments, discussion and experience. You'll learn how to relate to others' styles, identify and resolve learning problems related to style issues. The course discusses how to incorporate a variety of learning experiences to accommodate different styles when instructing or designing training, and helps you use creative and effective training methods to reach learning objectives. Discussions focus on applications for yourself, work and training environments.

PURNIMA KRISHNAMURTHY, M.B.A.

CLASSROOM WITH ONLINE MATERIALS 2 meetings | 9 am-5 pm | July 8-15

Section Number 3967.(046)

### **Flective**

### **Designing Training Programs**

BUSAD.X450. (2.0 quarter units) Professional Credit: HRCI-PHR, SPHR and GPHR general recertification credit, 20.0 hours.

This course offers an introduction to designing training events and programs for professionals entering the field. Topics include needs analysis, adult learning theory with a focus on learning goals and objectives, experiential methods, organization and evaluation. The course emphasizes using design skills to create a learning activity. You'll design training activities for the individuals and groups you serve, and you'll gain valuable feedback on your training design.

Prerequisite(s): "Instructional Design and Delivery, Introduction.'

PURNIMA KRISHNAMURTHY, M.B.A.

CLASSROOM WITH ONLINE MATERIALS 4 meetings | 6-9:30 pm | June 6, 13; and 9 am-5 pm | June 10, 17. Fee: \$660.

Section Number 3132.(059)

### Instructional Needs Assessment and Evaluation

BUSAD.X401.5 (1.5 quarter units) Professional Credit: HRCI-PHR, SPHR and GPHR general recertification credit, 12.0 hours.

This course builds the skills needed to plan and implement assessment and evaluation in corporate training, and college and university settings. Best practices 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. You'll also learn about methods (e.g., performance-based, self-assessment, portfolios, teamwork, and fieldwork) and ways instructors can conduct self-assessments (e.g., teaching or training portfolios).

PURNIMA KRISHNAMURTHY, M.B.A.

CLASSROOM WITH ONLINE MATERIALS 2 meetings | 8:30 am-5 pm | August 19, 26 Fee: \$610.

Section Number 1659.(055)

### Introduction to Online Teaching

EDUC.X400.50 (2.0 quarter 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.

Prerequisite(s): "Instructional Design and Delivery, Introduction.

ALAN TSUDA, M.B.A.

ONLINE | June 19-July 30 Fee: \$460.

Section Number 22175.(021)

### Role of the Project Manager

For course description, see page 40.





# Teaching English to Speakers of Other Languages (TESOL)

### **CERTIFICATE PROGRAM**

# Teaching English to Speakers of Other Languages (TESOL)

### **PROGRAM SUMMARY**

Teachers of English as a second language generally work with immigrants and foreign nationals living in English-speaking countries. TESOL teachers need special preparation to meet the unique challenges in settings where students have had some exposure to English but are still struggling. UCSC Silicon Valley Extension offers a specialized sequence of courses in linguistics and education to prepare instructors to enter the TESOL field. The program provides teachers with the knowledge, strategies and practice they need to feel comfortable teaching English classes to students of various levels and backgrounds. Join the hundreds of students who have completed this certificate and gone on to rewarding careers.

### **CERTIFICATE REQUIREMENTS**

To obtain the TESOL Certificate, you must successfully complete **23 units of core courses and 4 units of electives.** In order to be eligible for this certificate, you must maintain an overall 3.0 grade-point average (GPA) for all required and elective courses.

### RECOMMENDED COURSE SEQUENCE

The practicum course is taken at the end, but the other courses can be taken in any order. We also recommend that you attend the Info Session.

### PROGRAM CHAIR



JESSE GILLISPIE, Ph.D., has a doctorate in Education with an emphasis in Applied Linguistics and Language in Social Interaction. She has written about and conducted research on the relationship between language, identity and learning. Dr. Gillispie has worked with a diverse group of English Language Learners from elementary students to postdoctoral researchers. She has presented her work at numerous conferences including ethnography forums, the American Anthropological Association, the American Educational Research Association, and the American Association of Applied Linguistics. Her publications and conference presentations span topics covering identity development and second language learning, teaching and learning in everyday classroom interaction, and the role of classroom management in student success and identity development. A native Northern Californian, Dr. Gillispie lived in Germany and France before settling in the Bay Area.

# ENGLISH ENGLISH ENGLISH ZEAL

# INFO

### **TESOL**





five Education certificate programs for new or returning students. Education department staff and instructors will be available to answer individual questions and recommend course sequences. You'll also have the opportunity to network with fellow students and discuss career options for educators in various fields. We encourage you to enroll early to reserve your space.

### **CLASSROOM**

1 meeting | 6:30–8:30 pm | August 23 No fee, but enrollment is required.

Section Number 23593.(018)

### ENROLL **EARLY!**

Enroll at least seven days prior to your course's start date to save your seat and allow time to prepare for the first class meeting. Enrolling early also helps ensure that your course is not cancelled due to low enrollment.

### TEACHING ENGLISH TO SPEAKERS OF OTHER LANGUAGES (TESOL) CERTIFICATE

### 27-unit minimum

REQUIRED COURSES (23 units)	Units
Language StructureFirst and Second Language Development	3.0
First and Second Language Development	3.0
Methodology of Bilingual and English Language	
Development	4.0
Culture and Cultural Diversity	4.0
Fundamentals of English Grammar for ESL Teachers	2.0
Assessment, Evaluation and Placement	2.0
TESOL Practicum	5.0
	5.0 Units
ELECTIVE COURSES (four units) English as a Second Language Through Music and Movement	Units 2.0
ELECTIVE COURSES (four units) English as a Second Language Through Music and Movement	Units 2.0
ELECTIVE COURSES (four units) English as a Second Language Through Music and Movement Instructional Design and Delivery, Introduction	Units2.0
ELECTIVE COURSES (four units)  English as a Second Language Through Music and Movement  Instructional Design and Delivery, Introduction  Teaching Beginning ESL Students: Principles and Practices  Teaching English to Asian Students. U.S. and Abroad	Units2.01.0
TESOL Practicum	Units

Certificate schedule outline of program curriculum and annual schedule are found online. From the homepage, select: "Area of Study"; department; then certificate title as listed above.

### Required Courses

### Assessment, Evaluation and Placement

EDUC.X366.11(2) (2.0 quarter 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, participants review the purpose, methods and limitations of assessment, evaluation and placement. Activities include hands-on practice writing, analyzing and evaluating a variety of test types in TESOL.

DEBORAH CHOE, Ed.D.

CLASSROOM WITH ONLINE MATERIALS 6 meetings | 6–9 pm | June 14–July 19 Fee: \$395.

Section Number 20031.(026)

### **Culture and Cultural Diversity**

EDUC.X366.5 (4.0 quarter 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 analyze how culture is depicted in fiction and write a social, cultural, and historical analysis of a cultural group in California. By assuming an anthropological view of culture as a phenomenon of learned practices, products and perspectives in a community, you will expand your ideas about language, culture, teaching and learning.

JESSE GILLISPIE, Ph.D.

CLASSROOM WITH ONLINE MATERIALS 4 meetings | 9 am-3 pm | July 8-August 26 Fee: \$780.

Section Number 0776.(088)

### Fundamentals of English Grammar for ESL Teachers

EDUC.X366.47 (2.0 quarter 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 goal of this course is to explore these points.

FRAUKE UHLENBRUCH, Ph.D. DANIEL HECKMYER, M.A.

CLASSROOM WITH ONLINE MATERIALS 6 meetings | 6–9 pm | July 25–August 29 Fee: \$395.

Section Number 30089.(014)

### Language Structure

EDUC.X366.10 (3.0 quarter units)

In order to develop teaching expertise in TESOL and bilingual education, it is critical that educators understand language structure and use, with emphasis on language universals and varieties. This course focuses

on sound systems (phonology), word formation (morphology), grammar (syntax), word meanings (semantics), language in context, written and oral discourse, and language variation. You'll also learn about the structure of selected languages and transcription of sounds.

SARAH HARMON, Ph.D.

CLASSROOM WITH ONLINE MATERIALS 4 meetings | 9 am—4 pm | July 15—August 19 Fee: \$590.

Section Number 1851.(123)

### **Elective Courses**

# Attention Deficit Hyperactivity Disorder (ADHD) in the Classroom

For course description, see page 48.

### English As a Second Language Through Music and Movement

X300.246 EDUC (2.0 quarter units)

Music is a part of all cultures and plays an important role in our lives. It can also be an exceptional tool for teaching ESL. Music and movement activities in the classroom can offer a beneficial break from routine. They can help your students develop primary language skills of listening, speaking, reading and writing. This course provides the tools that teachers need to easily foster the acquisition of ESL through song lyrics and student movement. You'll develop practical lesson plans with activities that can be used in the classroom.

KRISTIE LAMBERT, M.A.

ONLINE | June 28–July 30 Fee: \$395.

Section Number 30000.(008)

### Instructional Design and Delivery, Introduction

For course description, see page 54.

# Teaching Beginning ESL Students: Principles and Practices

EDUC.X366.26 (1.5 quarter units)

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? This course offers 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.

DEBORAH CHOE, Ed.D.

CLASSROOM WITH ONLINE MATERIALS 5 meetings | 6–9 pm | July 24–August 21 Fee: \$300.

Section Number 5818.(025)





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Participating in this educational program does not in itself provide preference in admission to the University of California. Students interested in applying to UC should refer to the UC Admissions Web site or the admissions office of the UC campus they wish to attend for details about the admissions process.

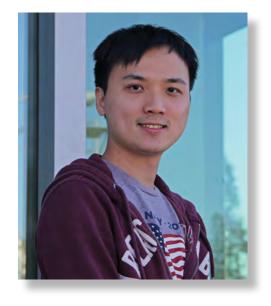
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# INNOVATE

# Engineering & Technology

WHAT STUDENTS SAV

I learned about UCSC Extension's programs online and found that this was the shortest way to get an OPT visa.



### **POC HSU**

### Computer Programming

Before arriving in Silicon Valley, Poc Hsu had an established career as a software developer in Taiwan. During the final two years of his five year long tenure in the field, he developed a passion for Web development, and made the decision to switch careers. He began to look for work, but soon realized that job prospects in his native Taiwan were scarce. Hsu began to look abroad, and eventually decided to work in the US.

"I wanted to work in America," he says. "As a foreigner, you have to get an OPT to work. I learned about UCSC Extension's programs online and found that this was the shortest way to get an OPT visa."

### Skills Put to Immediate Use

While planning his course schedule, Hsu applied his programming skills to develop an application for the Extension website designed to help international students plan their academic course schedule. The application was so helpful that it caught the attention of Extension's Director of Engineering, who collaborated with Hsu on further iterations.

"The course planning tool is designed to help students find course details on the website, such as day of week, time of day, cost and units," Hsu says. "I hope to help future students with their course planning."

### Courses Translate to the Workplace

Hsu has been able to leverage his skills to land an internship with Cloud Landing, while still completing his certification.

"I intern as a full-stack developer at Cloud Landing, using REACT and Redux on the front-end," he says. "I took the 'Web Application Development Using React and Flux' course, which is really helping me for the position."

The ability to work and attend school simultaneously has provided Hsu with the opportunity to learn from a cultural standpoint as well.

"One of the benefits of doing an internship while I study is that I gain a lot of experience working with people from different cultures and different countries," he says. "Silicon Valley is a great place to expose us to people from around the world."

Tell Us Your Story

We'd love to hear how you applied new skills in the workplace, or how your new credentials led to exciting job opportunities. Share your latest achievements by submitting your Extension story to extensionfeedback@ucsc.edu.

# Hardware Systems and VLSI Engineering

### CERTIFICATE PROGRAM

### Embedded Systems

### PROGRAM SUMMARY

Embedded systems refer to a growing range of function-specific computer and communication systems, including mobile devices, Internet of Things, networking equipment, industrial controllers and military electronics. This certificate program offers a comprehensive curriculum in Embedded Systems that will help new engineers gain experience in the field and benefit practitioners who want to keep up with changing technology. Instruction is geared to working professionals in a wide variety of fields, including:

- Hardware design: System architecture, board design, protocols and components
- FPGA implementation: Logic design, verification and system implementation
- Firmware and device programming: CPU architecture, IO and memory interface
- Embedded software development: Real-time embedded programming, Linux-based systems

### **PROGRAM BENEFITS**

- Wide variety of advanced topics helps students develop areas of specialization
- Courses taught by working professionals
- Board and programming projects for hands-on learning
- Courses frequently updated to reflect changing technology and industry needs

### **CERTIFICATE REQUIREMENTS**

To obtain the Certificate in Embedded Systems, you must successfully complete a total of **14 units**, including one of the five core courses. One related outside elective or "Also of Interest" course may be counted toward certificate upon department approval.

### PREREQUISITES

You will need a degree in a technical field or equivalent knowledge acquired through training and experience in system design and development. C programming knowledge is recommended.

### RECOMMENDED COURSE SEQUENCE

Students should follow the recommended prerequisites or skills needed of each course. The sequence may vary based on student background and professional interest.

Some courses may be listed in more than one program. However, only one course may be shared between two Engineering and Technology certificate programs unless otherwise noted.

### Courses

### C Programming for Beginners

For course description, see page 70.

### C Programming, Advanced

For course description, see page 70.

# Comprehensive Signal and Power Integrity for High-Speed Digital Systems

EE.X400.121 (3.0 quarter units)

This course covers signal and power integrity analysis of high-speed digital systems, and the modeling and design techniques used in high-speed links (in board, package, and connector). The instructor introduces IO modeling including IBIS, behavioral, functional, and ESD. Also explained are the concepts of equalization design and signaling techniques such as differential, NRZ, and pulse. At the system level, topics include clocking schemes such as PLL, DLL and CDR; timing jitter analysis; and power analysis topics such as IR drop, AC noise, simultaneous switching noise and decoupling capacitor.

Prerequisite(s): "Jitter Essentials," and "Printed Circuit Board Design for Signal Integrity and EMC Compliance." Students must have a basic understanding of signal integrity, electromagnetic compatibility, printed circuit boards or packages.

WENDEM BEYENE, Ph.D.

CLASSROOM WITH ONLINE MATERIALS
10 meetings | 6:30–9:30 pm | August 18–October 27
Fee: \$1020.

Section Number 22874.(016)

### Design Overview of High Efficiency Switch-mode Power Supply

EE.X400.138 (3.0 quarter units)

In this course, you'll gain a hands-on understanding of high efficiency analog and digital switch-mode power supplies that can meet system needs and regulatory requirements. The course covers the concepts, operations, and design considerations related to efficiency, EMI, thermal and safety. The lectures will be supplemented with hardware demonstrations and waveform observations of power supply behaviors. The course will equip you with the modern integrated solutions needed to achieve high efficiency and high power density, and includes the topics of digitally controlled power supplies.

Prerequisite(s): Knowledge of electronics and basic understanding of an electrical system design with power supply.

EDWARD ONG, M.S., DBA

CLASSROOM WITH ONLINE MATERIALS 8 meetings | 9 am–1 pm | June 24–August 12 Fee: \$980.

Section Number 23590.(013)

# INFO SESSION

### Embedded Systems and VLSI Engineering Programs



This free event is an

informal session for new or returning students who are interested in our Embedded Systems and VLSI Engineering certificate programs. You'll learn the program objectives, requirements and the technical skills you'll gain by studying with us. In addition to general Q&A, program staff will be available to answer your questions, help you select courses and plan a course sequence that fits your goals. This is an excellent opportunity to receive course counseling for upcoming quarters. Enroll early to reserve your space.

#### CLASSROOM

1 meeting | 6:30–8:30 pm | June 7 No fee, but enrollment is required.

### **Section Number 22403.(023)**

CLASSROOM

1 meeting | 6:30–8:30 pm | August 22 No fee, but enrollment is required.

Section Number 22403.(024)

### **ENGINEERING & TECHNOLOGY**

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▶ User Experience and Web Design

80

### **EMBEDDED SYSTEMS CERTIFICATE** 14-unit minimum \*Choose one of these five core courses Units System Design Printed Circuit Board Design for Signal Integrity and EMC Compliance......1.5 Comprehensive Signal and Power Integrity for High-Speed Digital Systems.......3.0 System Design for Low Power Management ......1.0 **FPGA Design** \*Practical Design with Xilinx FPGAs......3.0 Embedded Design with Xilinx FPGAs......3.0 SystemVerilog for ASIC and FPGA Design......3.0 **Embedded Software** \*Embedded Firmware Essentials ......2.0

Certificate schedule outline of program curriculum and annual schedule are found online. From the homepage, select: "Area of Study"; department; then certificate title as listed above.





### The Internet of Things: Sensors, Platforms, Communications, and Applications

EE.X400.129 (3.0 quarter units)

This course introduces the fundamentals of the Internet of Things, with emphasis on designing end-to-end IoT systems and end-point IoT devices. You'll learn the basics of designing and developing IoT applications, include building blocks, characteristics of IoT systems, and design patterns. The course also presents real-world case studies and domain-specific IoT applications. In addition, you'll learn to design and prototype IoT applications with a particular focus on end-point IoT devices. The different components of end-point devices such as sensors, actuators and IO interfaces are covered in detail.

Prerequisite(s): "C Programming for Beginners." Knowledge of embedded system hardware and programming experience with C.

GILBERT GARCIA, B.S., M.B.A.

CLASSROOM WITH ONLINE MATERIALS 10 meetings | 6:30–9:30 pm | June 23–August 25 Fee: \$910.

Section Number 30402.(007)

### Jitter Essentials

EE.X400.085 (1.5 quarter units)

Learn the definitions of various types of jitter (including phase noise), understand which type of jitter is important to your application and why, plus learn how to propagate jitter through a system, create jitter budgets, measure and minimize jitter, and more. 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.

GARY GIUST, Ph.D.

LAB WITH ONLINE MATERIALS 2 meetings | 9 am–5 pm | August 19–26 Fee: \$760

Section Number 21321.(019)

### **Linux Device Drivers**

For course description, see page 67.







### Linux Device Drivers, Advanced

For course description, see page 67.

### **Practical Design with Xilinx FPGAs**

CMPE.X432.1 (3.0 quarter units)

This course offers a practical introduction to programmable logic design with Xilinx FPGAs. Using several examples and design techniques, you will be taken through a complete programmable logic device (PLD) design. Implementation topics include clocking, handling signals across clock domains, managing clock jitter, and debouncing input from asynchronous signals. You will also learn to manage ground bounce and power dissipation. By the end of the course, you should be able to complete a design with Xilinx FPGAs and understand design and timing reports. The course includes a student project.

Prerequisite(s): Experience with logic design of digital systems or equivalent knowledge. Familiarity with Verilog design language.

JESSE JENKINS, Ph.D.

CLASSROOM WITH ONLINE MATERIALS 10 meetings | 6:30–9:30 pm | June 28–August 30 Fee: \$910.

Section Number 30413.(005)

### Real-time Embedded Systems Programming, Introduction

CMPE.X439.7 (3.0 quarter units)

This introductory course provides a foundation in real-time embedded systems with hands-on learning. The course offers the fundamentals of real-time scheduling and resource management protocols, then covers the use of RTOS to meet real-time requirements. You'll learn about interrupt handling, polling, using timers, and detecting and preventing deadlocks. The course discusses multi-threading, cooperative versus preemptive multi-tasking and inter-process communications, focusing on programming in FreeRTOS and internals. You'll design and code a real-time embedded systems project in C language on a development board using an ARM-based SDK and an open-source RTOS.

 $\label{lem:precedent} \textit{Prerequisite(s):} \ A \ \text{strong background in C programming} \\ \text{and an understanding of embedded system architecture.}$ 

SHAHED SIDDIQUI, M.S.

CLASSROOM WITH ONLINE MATERIALS 10 meetings | 6:30–9:30 pm | June 29–August 31 Fee: \$910.

Section Number 5381.(039)

### SystemVerilog for ASIC and FPGA Design

For course description, see page 64.

### Also of Interest

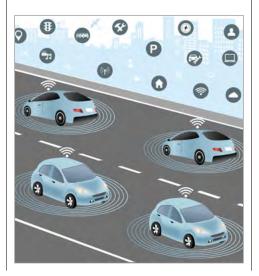
### TCP/IP Essentials

For course description, see page 66.









### EARN CREDIT TOWARD AN M.S. IN ENGINEERING

The Engineering and Technology Department has secured a transfer agreement with the University of Wisconsin—Platteville. This agreement specifically assists students who have completed either an Embedded Systems Certificate or a Software Engineering and Quality Certificate, and would like to pursue an online Master of Science in Engineering degree. Applicants to the master's degree program must hold a bachelor's degree from an accredited institution and fulfill the school's admissions requirements.

### GRADUATE-DEGREE CREDIT TRANSFER AGREEMENTS FOR SELECTED

### **CERTIFICATE HOLDERS**

#### UNIVERSITY OF WISCONSIN-PLATTEVILLE

Before entering the UW–Platteville M.S. in Engineering Program, students must complete the UCSC Extension Embedded Systems or Software Engineering and Quality Certificate with a grade of B or better in all courses. Completion of the UCSC Extension Certificate (with 14 quarter units) equates to 9 graduate elective credits in the UW–Platteville online M.S. in Engineering Program. See school website for other requirements: www.uwplatt.edu/disted

For information on this agreement, contact the Engineering and Technology Department at (408) 861-3860, or extensionprogram@ucsc.edu.

# ACCESS TO ONLINE COURSES AND MATERIALS



If you are enrolling for the first time in an Online course, or a classroom course with Online Materials, you will receive an account for UCSC Extension Online via email within 12 hours. If you have previously taken a course with online materials, you should use your existing account. Course sites will open one day prior to the official start date.

For more information, including help retrieving your account info, please visit ucsc-extension.edu/online-faqs.

For information on textbooks, see page 92 or visit **ucsc-extension.edu/bookstore.** 

### CERTIFICATE PROGRAM

### VLSI Engineering

### PROGRAM SUMMARY

UCSC Silicon Valley Extension offers the VLSI (Very Large Scale Integration) Engineering Certificate Program for professionals working in the integrated circuit, ASIC, semiconductor, EDA, device and system industries. With more than 20 UC-quality courses, our VLSI program is the most complete integrated circuit curriculum available in Silicon Valley. Students gain practical experience using the latest EDA tools on Linux in our state-of-the-art VLSI Lab. Our expert faculty teaches hardware specification, logic design, verification, synthesis, physical implementation, circuit design, and testing of integrated circuit products. We keep you up-to-date with the latest design methodology and tools. This program has served Silicon Valley VLSI professionals for over 20 years.

### CERTIFICATE REQUIREMENTS

To obtain the Certificate in VLSI Engineering, you must successfully complete a total of 14 units, including two of the five core courses. One related outside elective or "Also of Interest" course may be counted in certificate upon department approval.

### **PROGRAM BENEFITS**

- Learn from VLSI experts
- Practice with real EDA tools
- Access labs integrated with lectures
- Learn using real-world test cases
- Keep up-to-date with trends in the chip industry

### PREREQUISITES

You will need a degree in a technical field or equivalent knowledge acquired through training and experience in hardware design and development. Experience with Linux or UNIX is required for the lab sessions. Knowledge of a programming language (e.g., C, Perl or Bash Shell) may be helpful.

### RECOMMENDED COURSE SEQUENCE

Students should follow the recommended prerequisites or skills needed of each course. The sequence may vary based on student background and professional interest.

Some courses may be listed in more than one program. However, only one course may be shared between two Engineering and Technology certificate programs unless otherwise noted.



### VLSI ENGINEERING CERTIFICATE

### 14-unit minimum

\*Choose two of these five core courses

Units

### **Design Methodology**

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

### **Logic and Functional Design**

*Digital Logic Design Using Verilog	3.0
Logic Synthesis, Introduction	3.0
*Practical DFT Concepts for ASICs: With Nanometer Test Enhancements	
IO Concepts and Protocols: PCI Express, Ethernet, and Fibre Channel	3.0
Digital Design with FPGA	
3	

### SystemVerilog and Verification

ernog and vermeation
erilog Essentials Functional Verification and Simulation
erilog for ASIC and FPGA Design3.0
erilog Assertions and Formal Verification
l Verification with SystemVerilog OOP Testbench3.0
nd Functional Verification Using UVM (Universal Verification Methodology)3.0
2

### Physical Design and Timing Closure

*Physical Design Flow from Netlist to GDS-II	3.0
ASIC Physical Design, Advanced	3.0
Timing Closure in IC Design	3.0
3	

Circuit Design	
Low-Power Design of Nano-Scale Digital Circuits	
*Analog IC Design, Introduction	3.0
IO Design Fundamentals	3.0
Wireless Communication and Mobile Antenna Design, Introduction	3.0
Jitter Essentials	
Comprehensive Signal and Power Integrity for High-Speed Digital Systems	3.0

Certificate schedule outline of program curriculum and annual schedule are found online. From the homepage, select: "Area of Study"; department; then certificate title as listed above.



### Courses

# Advanced Verification with SystemVerilog OOP Testbench

CMPE.X400.292 (3.0 quarter units)

This course focuses on the use of advanced verification features in SystemVerilog. Students will gain experience developing an industrial-strength object-oriented programming (OOP) testbench. The course starts with building flexible testbench components and continues with functional coverage to round up the development of a complete verification environment. The objective is for students to become familiar with the flexibility of an OOP-centric technique, the power of constrained random verification and the use of functional coverage tools. It is also the prerequisite to "System and Functional Verification Using UVM (Universal Verification Methodology)" (course #0027). Concepts introduced in class are reinforced in the lab.

Prerequisite(s): "SystemVerilog Essentials: Functional Verification and Simulation" and "SystemVerilog for ASIC and FPGA Design." 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.

BENJAMIN TING, M.S.E.E.

LAB WITH ONLINE MATERIALS 10 meetings | 6:30–9:30 pm | June 29–August 31 Fee: \$1020.

Section Number 18966.(036)

# Physical Design Flow from Netlist to GDS-II

CMPE.X446.7 (3.0 quarter units)

This course is an introduction to ASIC physical design flow and tools from netlist to GDS-II. The course starts with floor planning and block pin assignment. The instructor then addresses 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.

Prerequisite(s): Basic knowledge of backend design flow. Hands-on experience with Linux/Unix will be required for lab exercises.

SAM HUYNH, Ph.D.

LAB WITH ONLINE MATERIALS 10 meetings | 6:30–9:30 pm | July 5–September 6 Fee: \$980.

Section Number 4436.(024)

### Practical DFT Concepts for ASICs: With Nanometer Test Enhancements

CMPE.X443.9 (3.0 quarter units)

This course is ideal for IC designers seeking a deeper understanding of test issues and test engineers wanting to stay current with emerging trends and tools. You will gain hands-on experience building scan chains and generating test patterns using Synopsys DFT Compiler (DFTC) and TetraMAX ATPG. Advanced topics include building multiple scan-chain insertion, employing sequential ATPG, optimizing DFT logic, understanding LBIST and MBIST. By the end of the course, you will be able to hand off a full-scan design and generate a high-coverage test program for nanometer ASIC.

*Prerequisite(s):* A working knowledge of digital logic design is recommended.

CHARLES DANCAK, M.S.E.E.

LAB WITH ONLINE MATERIALS
10 meetings | 6:30–9:30 pm | June 28–August 30
Fee: \$980.

Section Number 5373.(029)

# Comprehensive Signal and Power Integrity for High-Speed Digital Systems

For course description, see page 59.

### **Jitter Essentials**

For course description, see page 60.

### Logic Synthesis, Introduction

CMPE.X402.4 (3.0 quarter units)

This course outlines various concepts of logic synthesis. Starting with the basics of synthesis, the course explains the Synopsys tools and their use in synthesizing highlevel language into gates. It also covers various options such as partitioning, design, gate-level optimization, time/area constraints and library management. This course is intended for design engineers with some knowledge of hardware description languages such as Verilog HDL or VHDL. It is a lab-based course with hands-on exercises.

*Prerequisite(s):* Some knowledge of a hardware description language (Verilog or VHDL).

PRAVIN BHUSARI, M.S.E.E.

LAB WITH ONLINE MATERIALS

10 meetings | 9 am—12 pm | June 17—August 19 Fee: \$980.

Section Number 4377.(109)

# Low-Power Design of Nano-Scale Digital Circuits

EE.X400.097 (3.0 quarter units)

This course introduces advanced topics in nanoscale (below 90nm) VLSI device and circuit design. High-performance and low-power design issues in modern and future nano-scale CMOS technologies are discussed in detail. Students will learn low power design approaches and techniques at different levels of abstraction. New design techniques will be introduced to deal with nano circuit designs under excessive leakage and process variations. Several non-classical CMOS devices for circuit design in such technologies will be explored. Prospects of future non-silicon nanotechnologies will be reviewed.

Prerequisite(s): Knowledge of CMOS technology and digital circuit design in CMOS is recommended, but an overview will be provided.

HAMID MAHMOODI, Ph.D.

ONLINE | June 16—September 15 Enrollment accepted through July 21. Fee: \$980.

Section Number 21941.(807)

ONLINE | August 4—November 3 Enrollment accepted through September 8. Fee: \$980.

Section Number 21941.(808)

### Practical Design with Xilinx FPGAs

For course description, see page 61.

# System and Functional Verification Using UVM (Universal Verification Methodology)

CMPE.X439.8 (3.0 quarter units)

Universal Verification Methodology (UVM) is the industry standard for functional verification methodology. This course introduces the UVM architecture; its core set of base-classes and utility methods, and associated factory automation techniques. 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. Through labs, take-home assignments, and a team project, you'll learn the power of UVM for successfully designing complex constraint-random coverage driven verification projects.

Prerequisite(s): 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.

BENJAMIN TING, M.S.E.E.

LAB WITH ONLINE MATERIALS 10 meetings | 6:30–9:30 pm | June 27–September 5 Fee: \$1020.

Section Number 0027.(036)



# SystemVerilog Assertions and Formal Verification

CMPE.X400.348 (3.0 quarter units)

This course introduces SystemVerilog Assertion (SVA) concepts and syntax, using small examples and a realistic design. It covers the OVL checker library, writing and debugging assertions. The second part of the course introduces the formal verification theory and tool. You will learn FV application in several design stages and in different functional areas, such as SoC connectivity, coverage closure, and x-propagation checks. The course addresses key topics in detail, from language constructs to assertion coding guidelines that include practical examples of how to use assertions in verification.

Prerequisite(s): "SystemVerilog Essentials: Functional Verification and Simulation." Skills Needed: Knowledge of basic logic design, simulation and familiarity with a hardware description language.

MANDAR MUNISHWAR, B.S.

LAB WITH ONLINE MATERIALS 10 meetings | 6:30–9:30 pm | June 22–August 24 Fee: \$980.

Section Number 20062.(016)

### SystemVerilog for ASIC and FPGA Design

CMPE.X400.363 (3.0 quarter units)

This course prepares hardware engineers, ASIC and FPGA designers, and design-support staff to use the high-level syntax of SystemVerilog to design, debug, and synthesize digital logic for ASICs, FPGAs, and IP cores. Students will learn SystemVerilog's basic building blocks and language constructs, including synthesizable data types and operators, structures and unions, 2-D arrays and loops, and the bus interface unit. In lab sessions, they will write code and synthesize it into digital logic and bus fabric, using both ASIC and FPGA tools.

Prerequisite(s): "Logic Synthesis, Introduction," and "Practical Design with Xilinx FPGAs." Familiarity with either Verilog or VHDL. No prior exposure to SystemVerilog is needed.

CHARLES DANCAK, M.S.E.E.

LAB WITH ONLINE MATERIALS

10 meetings | 6:30–9:30 pm | June 30–September 8 Fee: \$980.

Section Number 20095.(020)

### Also of Interest

### Perl Programming, Comprehensive

For course description, see page 72.



# Information Technology

### CERTIFICATE PROGRAM

### Information Technology

### PROGRAM SUMMARY

Our Information Technology Certificate features rich offerings in the areas of networking fundamentals, Linux system administration, data center technology and cloud computing, virtualization, storage networking, security technologies, IT automation and database management. Select a few courses to suit your professional needs or pursue our IT certificate to access new job opportunities or advance in your career. Individuals will find that our program is a focused and efficient means of staying current with the industry trends. This unique program is the only IT-specific credential of its kind available in Silicon Valley with University of California certification.

### CERTIFICATE REQUIREMENTS

To obtain the Certificate in Information Technology, you must take at least two of the five core courses from different tracks and complete **14 units.** One related outside elective or "Also of Interest" course may be counted in certificate upon department approval.

The IT Certificate includes five major areas of study:

- Networking and the Internet: These fundamental courses build essential knowledge and are designed for students who are new to the field or changing careers.
- Linux Administration: This track is designed for those who work on the most popular server and device platform operating system.
- Data Center and Cloud Computing: This series
  of courses in virtualization, storage networking, data
  centers, cloud computing, server performance tuning
  and network design covers the core IT innovations
  in recent years.
- IT Security Technologies: We offer a series of high-impact courses in IT security technologies such as cryptography and e-commerce security.
- IT Automation: For those interested in IT automation, database management and programming applications, we offer electives that will enhance your marketable skills.

For additional requirements, go to ucsc-extension.edu.



### PREREQUISITES

Students enrolled in this program are expected to be familiar with the Internet, and possess basic knowledge of computer networking and communications. You should be familiar with at least one modern computer operating system. Many of the courses in this program have specific prerequisites that are listed in the course descriptions.

### RECOMMENDED COURSE SEQUENCE

For those new to IT, we recommend that you begin with Network Fundamentals courses, such as "Computer Networking Essentials" and "TCP/IP Essentials." To gain a solid understanding of the entire industry, students should consider taking all fundamental courses, though they are not required. For those on the Linux Administration track, it is strongly recommended that you take courses in the order listed. For those interested in Data Center Technologies and Systems Security, courses may be taken based on your interests and background. Each advanced course has specific prerequisites that you should consider before enrolling.

Some courses may be listed in more than one program. However, only one course may be shared between two Engineering and Technology certificate programs unless otherwise noted.

### Courses

### **Cloud Computing, Introduction**

For course description, see page 73.

### **Computer Networking Essentials**

CMPE.X416.6 (3.0 quarter units)

This foundation course introduces computer networking, networking technologies, and the Internet. It provides a comprehensive survey of the data and computer communications field. Emphasizing both the fundamental principles and the critical role of performance in driving protocol and network design, it explores the technical areas in data communications, wide-area networking, local-area networking, and protocol design. Participants 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; physical layer fundamentals; connectors and cabling; the medium access sublayer and data-link layers; bridging and switching; the network, transport, and upper layers; and network management techniques and technologies.

Prerequisite(s): Some experience with computers.

AHMAD YAZDI, M.S.C.S.

LAB WITH ONLINE MATERIALS 12 meetings | 6:30–9:30 pm | June 15–August 31 Fee: \$910.

Section Number 2458.(136)

### INFORMATION TECHNOLOGY CERTIFICATE

#### 14-unit minimum

*Choose two of these five core courses from different tracks.		Units
	ALVERY SELECTION AND CONTRACT OF THE PROPERTY	

### **Network Fundamentals** TCP/IP Essentials......2.0 Switching and Routing......3.0 **Linux Systems Administration** \*Linux System and Network Administration......3.0 **Data Center Technologies** \*System Virtualization Fundamentals.......2.5 VMware vSphere: Optimize and Scale [v6.0]......3.5 **Systems and Internet Security**

Certificate schedule outline of program curriculum and annual schedule are found online. From the homepage, select: "Area of Study"; department; then certificate title as listed above.

### **Information Security Essentials**

CMPE.X400.441 (3.0 quarter units)

This course introduces data security technologies in evolution from symmetric/asymmetric encryption to secure key management, Key Management Interoperability Protocol (KMIP) and global standards. It covers network security, Web services, mobile exploits on the server or the client side, and new trends in enterprises with virtualization and mobile devices. Each topic includes real-world case studies with analysis and quantification of the breaches. The course also introduces cloud computing security. By the end of the course, you'll understand the models, management techniques, best practices and technologies available to solve common security challenges.

Prerequisite(s): Solid knowledge of networking and data management is required.

JOSE CARREON, M.S.

CLASSROOM WITH ONLINE MATERIALS 10 meetings | 6:30–9:30 pm | June 21–August 23 Fee: \$910.

Section Number 30483.(002)

### **Linux System and Network Administration**

For course description, see page 68.

### **Linux Systems Programming**

For course description, see page 68.

### Linux. Introduction

For course description, see page 67.

### Perl Programming, Comprehensive

For course description, see page 72.

### Programming for Cloud Computing: **Amazon Web Services**

For course description, see page 75.

### **Python for Programmers**

For course description, see page 72.

### Relational Database Design and SQL **Programming**

For course description, see page 80.

### INFO SESSION

### Information **Technology**

and

### Database and **Data Analytics**



Join us to learn about our Information Technology and the Database

and Data Analytics certificate programs. The IT certificate includes tracks on networking fundamentals, data center technologies, system administration, enterprise security and IT automation. The Database and Data Analytics certificate offers basic database courses, as well as data science, Big Data and business intelligence. In addition to general Q&A, program staff will be available to answer your questions, help you select courses and plan a course sequence. Enroll early to reserve your space.

### CLASSROOM

1 meeting | 6:30-8:30 pm | June 6 No fee, but enrollment is required. **Section Number 30047.(016)** 

### CLASSROOM

1 meeting | 6:30-8:30 pm | August 24 No fee, but enrollment is required.

**Section Number 30047.(017)** 

### ACCESS TO **ONLINE COURSES** AND MATERIALS



If you are enrolling for the first time in an Online course, or a classroom course with Online Materials, you will receive an account for UCSC Extension Online via email within 12 hours. If you have previously taken a course with online materials, you should use your existing account. Course sites will open one day prior to the official start date.

For more information, including help retrieving your account info, please visit ucsc-extension.edu/online-faqs.

For information on textbooks, see page 92 or visit ucsc-extension.edu/bookstore.

### **Storage Technology in Data Centers**

CMPE.X444.1 (3.0 quarter units)

This course is an in-depth exploration of the storage technologies needed to meet the challenges of today's data centers. The course introduces the fundamental building blocks of enterprise storage such as FC/IP, SAN and DAS as well as block, file and object storage. It demystifies storage technologies in flash, cloud, mobility, converged storage, software-defined storage, SDDC, and Big Data storage - and covers the blueprint of cloud computing and the implementation of private, public and hybrid cloud storage. Students are invited to join the NetApp Certified Storage Associate (NCSA) program.

Prerequisite(s): A basic technical understanding of networking and storage concepts and terminology.

RAMIN ELAHI, M.S.E.E.

CLASSROOM WITH ONLINE MATERIALS 10 meetings | 6:30–9:30 pm | June 19–August 28 Fee: \$910.

Section Number 30029.(013)

### Switching and Routing

CMPE.X408.1 (3.0 quarter 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. This course is taught using Cisco routers and switches in the lab. You will gain hands-on experience working with the principle hardware in widest use, including operational premises and algorithmic decisions. You will also learn to configure routing protocols and troubleshoot the network using Cisco IOS commands.

Prerequisite(s): Knowledge of TCP/IP, completion of a data communication or networking course, or equivalent experience.

STEVE ARNOLD, M.B.A. AHMAD YAZDI, M.S.C.S.

LAB WITH ONLINE MATERIALS 10 meetings | 6:30–9:30 pm | June 20–August 29 Fee: \$810.

Section Number 2226.(076)

### TCP/IP Essentials

CMPE.X413.9 (2.0 quarter 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 the essential knowledge needed to apply the skills on the job. It is intended as a fundamental course for students who are interested in the fields of network engineering, systems administration, network security, and embedded systems.

Many network programming and security analysis tasks utilize the knowledge gained here.

*Prerequisite(s):* "Computer Networking Essentials," may be taken concurrently.

SIVA PRASAD, M.B.A., M.S.

ONLINE | June 16—September 15 Enrollment accepted through July 21. Fee: \$750.

Section Number 0661.(807)

ONLINE | August 4—November 3 Enrollment accepted through September 8. Fee: \$750.

**Section Number 0661.(808)** 

### Also of Interest

### C Programming for Beginners

For course description, see page 70.

### **Java Programming for Beginners**

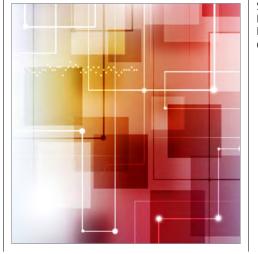
For course description, see page 71.

### Linux Based Web Application Development - Apache, MySQL, PHP

For course description, see page 67.

### Python Programming for Beginners

For course description, see page 72.



# Linux Programming and Administration

### CERTIFICATE PROGRAM

# Linux Programming and Administration

### PROGRAM SUMMARY

Linux is the operating system (OS) of choice for today's servers, network infrastructure, embedded systems and mobile devices. The Certificate Program in Linux Programming and Administration consists of two fields of study:

- The administrator track provides a solid foundation in configuring, operating and administrating these open, multi-user, multi-tasking Linux operating systems.
- The **development track** is for developers and system programmers to customize and optimize the processes, IOs and kernel modules.

Our program offers training at all levels, from basic installation and tools, network administration, programming drivers for devices, developing applications or services, to kernel customization for advanced systems. Many of our courses are not available in traditional colleges, yet they are highly applicable in a real-world work environment.

### CERTIFICATE REQUIREMENTS

To obtain the Certificate in Linux Programming and Administration, you must complete **14 units**, including one of three core courses. One related outside elective or "Also of Interest" course may be counted in the certificate upon department approval.

### PREREQUISITES

Each course has different prerequisites. Please review the course descriptions on our website to ensure that you meet the requirements, whether through education or job experience.

### RECOMMENDED COURSE SEQUENCE

If you have limited or no UNIX or Linux experience, we strongly recommend that you begin with "Linux, Introduction." The sequence may vary based on student background and professional interest.

Some courses may be listed in more than one program. However, only one course may be shared between two Engineering and Technology certificate programs unless otherwise noted.





### LINUX PROGRAMMING AND ADMINISTRATION CERTIFICATE

### 14-unit minimum

\*Choose one of these three core courses.

Units

Linux System Administration	
Linux System Administration Linux, Introduction	2.5
*Linux System and Network Administration	3.0
Computer Networking Essentials	3.0
Linux System Performance in the Cloud and Data Center	3.0
Cloud Computing, Introduction	0.5
System Virtualization Fundamentals	2.5
Storage Technology in Data Centers	3.0
VMware vSphere: Configuration and Management [v6.0]	
VMware vSphere: Optimize and Scale [v6.0]	3.5
Linux Programming	
Linux Systems Programming	3.0
, <b>,</b> ,	

Application Programming in Linux/UNIX

Certificate schedule outline of program curriculum and annual schedule are found online. From the homepage, select: "Area of Study"; department; then certificate title as listed above.

### Courses

### **Linux, Introduction**

CMPS.X472. (2.5 quarter 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.

SULEMAN SAYA, B.S.

LAB WITH ONLINE MATERIALS 8 meetings | 6:30–9:30 pm | June 19–July 10; and 9 am–1 pm | July 1, 8 Fee: \$840.

Section Number 2215.(177)

### C Programming for Beginners

For course description, see page 70.

### Cloud Computing, Introduction

For course description, see page 73.

### **Computer Networking Essentials**

For course description, see page 64.

### Linux Based Web Application Development - Apache, MySQL, PHP

CMPS.X400.510 (3.0 quarter units)

Linux, Apache, MySQL and PHP, collectively known as LAMP, comprise the majority of servers, databases and scripting languages on the Internet today. LAMP belongs to open-source and is very robust, available free, easily configured, deployed and maintained. This course teaches LAMP basics including installation, deployment and development of a website. You will learn the basics of programming MySQL (a popular Web database) and PHP (Hypertext Preprocessor, a website scripting language). Teaching method includes theory, practices and case studies. You will be able to develop basic to intermediate level 3-tier websites and applications with a database in the back-end.

Prerequisite(s):"Linux, Introduction" and basic knowledge and experience with website development on Linux or Windows. Some programming experience will

be helpful. Students have the option of learning Apache, MySQL and PHP on Windows platform. Linux platform is preferred.

TARAL OZA, M.S.

CLASSROOM WITH ONLINE MATERIALS 6 meetings | 9 am-3 pm | July 22-August 26 Fee: \$980.

Section Number 21958.(051)

ONLINE | June 16—September 15 Enrollment accepted through July 21. Fee: \$980.

Section Number 21958.(807)

ONLINE | August 4—November 3 Enrollment accepted through September 8. Fee: \$980.

Section Number 21958.(808)

### **Linux Device Drivers**

CMPE.X435.5 (3.0 quarter units)

This course briefly reviews architecture and driver concepts and discusses the design and implementation of Linux device drivers 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. The instructor will share code samples and real-world experiences of device and kernel porting.

Prerequisite(s): A basic knowledge of C language programming. "Linux Kernel Architecture and Programming" or equivalent experience is recommended.

RAGHAV VINJAMURI, B.S.E.E.

CLASSROOM WITH ONLINE MATERIALS 10 meetings | 6:30–9:30 pm | July 7–September 22 Fee: \$1020.

Section Number 2470.(128)

### Linux Device Drivers, Advanced

CMPS.X464.6 (3.0 quarter units)

This course covers advanced device drivers, from Linux kernel services and facilities to memory management, network stack, interrupt handling, DMA techniques, and kernel memory mapping. The course focuses on two IO subsystems, PCI and USB, and covers 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. You'll learn about 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.

Prerequisite(s): "Linux Device Drivers."

AMER ATHER, B.S.E.E.

CLASSROOM WITH ONLINE MATERIALS 10 meetings | 6:30–9:30 pm | June 22–August 24 Fee: \$1020.

Section Number 1016.(035)

# Linux Kernel Architecture and Programming

CMPS.X458.5 (3.0 quarter units)

This 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. Students gain hands-on experience with kernel programming as part of the class work.

Prerequisite(s): "Linux Systems Programming."
Proficient knowledge of Linux system programming and C programming language is required.

ANAND PAI, M.S.

CLASSROOM WITH ONLINE MATERIALS 10 meetings | 6–9 pm | June 19–August 28 Fae: \$980

Section Number 1397.(086)

SIVA PRASAD, M.B.A., M.S.

ONLINE | June 16—September 15 Enrollment accepted through July 21. Fee: \$980.

Section Number 1397.(807)

ONLINE | August 4—November 3 Enrollment accepted through September 8. Fee: \$980.

Section Number 1397.(808)





### Linux System and Network Administration

CMPS.X400.249 (3.0 quarter units)

This course provides the foundation for building and maintaining a server for Linux professionals and system administrators. The focus of this course will be on basic network configuration, services security, remote access configuration and administration of Linux server. Students perform basic administrative tasks for users, file systems, security policy, shell and Perl scripts, and network facilities such as NFS, DNS and DHCP. By the end of the course, participants will be able to administer and manage networked services on Linux-based platforms in a business environment.

Prerequisite(s): "Linux, Introduction." A basic knowledge of Linux, networks, or comparable industry experience.

SULEMAN SAYA, B.S.

LAB WITH ONLINE MATERIALS 9 meetings | 6:30–9:30 pm | July 17–31; and 9 am–1 pm | July 22, 29 and August 5 Fee: \$1020.

Section Number 13515.(028)

### **Linux Systems Programming**

CMPS.X496. (3.0 quarter units)

System calls are functions called from within a C program, which provide access to the lowest level resources of the OS. Topics covered in this course 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 docking; 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 the development of a complete ftp package, including the client-side interface and the server-side components.

Prerequisite(s): "Linux, Introduction." A basic knowledge of C language programming and a working knowledge of the Linux/UNIX operating environment are required.

RAGHAV VINJAMURI, B.S.E.E.

CLASSROOM WITH ONLINE MATERIALS 10 meetings | 6:30–9:30 pm | June 27–September 12 Fee: \$735.

Section Number 3493.(115)

### Perl Programming, Comprehensive

For course description, see page 72.

### **Python for Programmers**

For course description, see page 72.

### Storage Technology in Data Centers

For course description, see page 66.

# Software Development

If you're looking for training in software engineering principles or the latest programming languages, you'll find it at UCSC Silicon Valley Extension. We offer classroom and online courses in a variety of programming languages and platforms, including Java, .NET, and open sourced frameworks. We also offer certificates and courses in software engineering and in today's most popular OS platforms, including Linux, OSX and Windows. Our courses and certificates are designed to help Bay Area technical professionals stay competitive throughout their careers.

### CERTIFICATE PROGRAM

### Computer Programming

### PROGRAM SUMMARY

Software applications are deployed in nearly every facet of modern life. The result is a growing demand for technical professionals who can create, code, maintain and enhance software applications. UCSC Extension's certificate in Computer Programming can help you build a strong foundation in software development and apply coding skills across a wide range of platforms, from computers and mobile devices, to Web development and the cloud. The certificate covers all major programming languages used in the industry. Each language has its application environment. We offer two levels of courses to suit students with different backgrounds and needs. Many courses use open-source tools in a lab environment to give students hands-on programming experience. This is among the longest running and successful programs at UCSC Extension.

### **CERTIFICATE REQUIREMENTS**

To obtain the Certificate in Computer Programming, you must complete **14 units**, including two of the core courses. One related outside elective or "Also of Interest" course may be counted in certificate upon department approval.

### PROGRAM AUDIENCE

- Software developers who want to enhance their programming knowledge
- Entry-level or career changers looking to enter the software field
- Non-software professionals who need programming training
- Individuals learning programming for personal applications
- Project managers who work with programmers or manage software projects

### **PREREQUISITES**

Each course has different prerequisites. Please review the course details on our website to ensure that you meet the requirements, whether through education or job experience.

### RECOMMENDED COURSE SEQUENCE

Students should follow the recommended prerequisites or skills needed of each course. The sequence may vary based on student background and professional interest.

Some courses may be listed in more than one program. However, only one course may be shared between two Engineering and Technology certificate programs unless otherwise noted.

### **COMPUTER PROGRAMMING CERTIFICATE** 14-unit minimum Units \*Choose two of these core courses. **C Programming** C++ Programming Java Programming \*Java Programming, Comprehensive......3.0 **Scripting Languages** \*Perl Programming, Comprehensive......2.0 Python Programming for Beginners......1.5 **Windows Programming Mobile Device Programming** Developing Applications for iPhone and iPad, Introduction......................2.0 **Advanced Programming** Computational Intelligence, Introduction ......1.5

Certificate schedule outline of program curriculum and annual schedule are found online. From the homepage, select: "Area of Study"; department; then certificate title as listed above.



# INFO

### Software Development Programs



This free event is an informal session for new or returning students who are interested in our Computer Programming, Internet Programming and Development, Software Engineering and Quality, and Linux Programming and Administration programs. The event includes a short overview of Extension and discusses the highlights of courses in each software program. Program staff or a senior instructor will be available to answer your questions about courses and recommended course sequences. This is an excellent opportunity to receive course information for upcoming quarters. Enroll early to reserve

# your space. CLASSROOM

1 meeting | 6:30–8:30 pm | June 5 No fee, but enrollment is required.

Section Number 22404.(024)

### CLASSROOM

1 meeting | 6:30–8:30 pm | August 23 No fee, but enrollment is required.

Section Number 22404.(025)

# ACCESS TO ONLINE COURSES AND MATERIALS



If you are enrolling for the first time in an Online course, or a classroom course with Online Materials, you will receive an account for UCSC Extension Online via email within 12 hours. If you have previously taken a course with online materials, you should use your existing account. Course sites will open one day prior to the official start date.

For more information, including help retrieving your account info, please visit ucsc-extension.edu/online-faqs.

For information on textbooks, see page 92 or visit **ucsc-extension.edu/bookstore.** 

### Courses

### C Programming for Beginners

CMPS.X409.1 (2.0 quarter units)

This course will benefit individuals who want to learn the C programming language but have little or no programming background. The course begins with an overview of programming and tools. 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. You will receive assignments to write non-trivial programs and learn to create modular programs with efficiency and readability.

*Prerequisite(s):* Technical aptitude and experience with a computer operating system or equivalent knowledge.

BINEET SHARMA, M.S.C.S.

ONLINE | June 16—September 15 Enrollment accepted through July 21. Fee: \$620.

Section Number 5208.(807)

ONLINE | August 4—November 3 Enrollment accepted through September 8.

**Section Number 5208.(808)** 

### C Programming, Advanced

CMPS.X401.7 (3.0 quarter units)

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. The 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. You will learn to write efficient programs by understanding the complexities of various algorithms.

Prerequisite(s): "C Programming for Beginners." Students should have a good understanding of programming using data types such as pointers, control flow, structures and functions.

RAJAINDER YELDANDI, M.S.C.S., PMP®, CSM

CLASSROOM WITH ONLINE MATERIALS 8 meetings | 9 am—1 pm | July 8—August 26 Fee: \$800

Section Number 3948.(088)

ONLINE | June 16—September 15 Enrollment accepted through July 21. Fee: \$800.

Section Number 3948.(807)

ONLINE | August 4—November 3 Enrollment accepted through September 8. Fee: \$800

Section Number 3948.(808)

### C# .NET Programming, Advanced

CMPS.X400.376 (3.0 quarter units)

For students who have learned the basic C# language and the C#.NET integrated development environment, this course provides an opportunity to expand C# and .NET skills by learning advanced C# features and programming techniques. The course introduces the components of the .NET framework, database connectivity and Web application development.

*Prerequisite(s):* "C# .NET Programming, Comprehensive."

TARAL OZA, M.S.

CLASSROOM AND ONLINE (HYBRID)
4 meetings | 6:30–9:30 pm | July 21–September 8
Fee: \$910

Section Number 19026.(40)

### C# .NET Programming, Comprehensive

CMPS.X459.1 (3.0 quarter units)

This course introduces beginning and intermediate programmers to .NET programming using Microsoft's C# programming language. The instructor explains the Visual Studio development environment and reviews the basic constructs of C# language with detailed explanations of the C# regular expressions, delegates, events, generics and collections. The course 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.

*Prerequisite(s):* "C Programming for Beginners." Some programming experience with a high-level language such as C, C++, Java or Visual Basic. C# knowledge is not required.

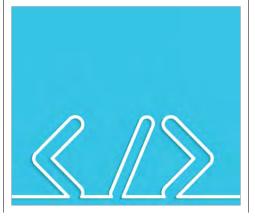
TARAL OZA, M.S.

ONLINE | June 16—September 15 Enrollment accepted through July 21. Fee: \$910.

Section Number 5408.(804)

ONLINE | August 4—November 3 Enrollment accepted through September 8. Fee: \$910.

Section Number 5408.(805)



### C++ Programming, Comprehensive

CMPS.X400.348 (3.0 quarter 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. Topics include object-oriented concepts; structure and input/output streams; declarations, identifiers, pointers, and arguments; memory management, constructors, and destructors; enumeration type, as constructor parameter; character strings, file I/O, functions; inheritance, and interaction diagrams; and exception handling, pointers, and functions.

Prerequisite(s): "C Programming for Beginners." Experience with a high level programming language such as C.

JAGADEESH VASUDEVAMURTHY, Ph.D.

CLASSROOM WITH ONLINE MATERIALS 10 meetings | 9 am—12 pm | June 24—September 9 Fee: \$1020.

Section Number 18344.(066)

SULEMAN SAYA, B.S.

ONLINE | June 16—September 15 Enrollment accepted through July 21. Fee: \$1020.

Section Number 18344.(807)

ONLINE | August 4—November 3 Enrollment accepted through September 8. Fee: \$1020.

Section Number 18344.(808)

### Computational Intelligence, Introduction

CMPS.X400.393 (1.5 quarter units)

Are you a computational professional seeking new problem-solving techniques? This course is designed to help you solve ill-defined problems that have conflicting constraints or contain data with high noise levels. You will learn the strengths and weaknesses of various computational and artificial intelligence (AI) techniques, and learn the fundamentals of search spaces, evolutionary computation, genetic programming, neural networks, swarm intelligence and fuzzy logic. The course covers how to solve AI problems using software on a provided live CD and offers techniques for representing and structuring real-world problems using AI.

*Prerequisite(s):* Experience with a computer programming language and basic algebra skills.

THOMAS POLIQUIN, B.S.E.E.

CLASSROOM WITH ONLINE MATERIALS 5 meetings | 6:30–9:30 pm | July 19–August 16 Fee: \$730.

Section Number 19951.(25)

#### Data Structures and Algorithms Using Java

CMPS.X400.008 (3.0 quarter units)

This course discusses how to efficiently use algorithms with powerful data structures in Java, covering 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—then write algorithms on these objects using techniques such as recursion, greedy, divide and conquer, back tracking and dynamic programming. The course discusses searching and sorting, union find problems, knapsack problems and NP complete problems. You will also learn to compute the worst case complexity of algorithms in terms of time and space.

*Prerequisite(s):* "Java Programming for Beginners." Working knowledge of Java or C/C++.

JAGADEESH VASUDEVAMURTHY, Ph.D.

CLASSROOM WITH ONLINE MATERIALS 10 meetings | 6–9 pm | June 26–August 28 Fee: \$980.

Section Number 30412.(005)

#### Developing Applications for Android Mobile Devices

CMPS.X400.507 (2.0 quarter units)

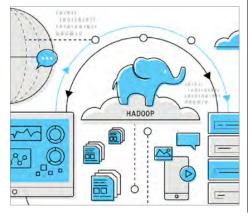
Android is an open-source platform for smartphones, tablets and the increasingly popular Internet-enabled devices (wearables, TV, etc.). This course offers an overview of the Android development platform. You will learn through a simple application that demonstrates how to build applications for the platform step by step. The course covers the platform architecture and basic mobile building blocks. The instructor provides interaction and guidance in programming assignments. You will learn how to implement the user interfaces, and use optional APIs and Google libraries to enrich the application.

Note(s): A laptop (Windows/Mac/Linux) is required. The instructor will give instructions to install Android Studio, but students should have some experience with software installation. Android phone is optional.

Prerequisite(s): "Java Programming for Beginners." Java programming experience is required to program Android. TARAL OZA. M.S.

CLASSROOM WITH ONLINE MATERIALS 7 meetings | 6:30–9:30 pm | July 18—August 29 Fee: \$730.

Section Number 21956.(049)



#### Developing Applications for iPhone and iPad. Introduction

CMPS.X400.503 (2.0 quarter units)

This introductory course provides a hands-on approach to the basic skills required to create iOS native applications. The course introduces Xcode and the iOS software development kit (SDK). You will learn the key features of the Swift programming language, including how to read and write Swift code. You will also learn how to customize iOS user interfaces using Libraries and Inspectors, build scenes within storyboards using Interface Builder, and understand the MVC Architecture.

Prerequisite(s): "C Programming for Beginners." Students should have some programming experience with a computer programming language.

BESS HO, M.S.

LAB WITH ONLINE MATERIALS 8 meetings | 6:30–9:30 pm | June 26–August 28 Fee: \$730.

Section Number 21938.(040)

#### Hadoop: Distributed Processing of Big Data

For course description, see page 79.

#### Introduction to Machine Learning and Data Mining

For course description, see page 79.

#### **Java Programming for Beginners**

CMPS.X439.3 (2.0 quarter units)

This course is an introduction to Java programming, starting 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 includes programming exercises.

Prerequisite(s): Students should have experience using logic. Some programming experience will be helpful. Ability to install and configure open-source software on own computers.

BINEET SHARMA, M.S.C.S.

LAB WITH ONLINE MATERIALS 8 meetings | 6:30–9:30 pm | June 26–August 14 Fee: \$625.

Section Number 5185.(104)

ONLINE | June 16—September 15 Enrollment accepted through July 21. Fee: \$625.

Section Number 5185.(807)

ONLINE | August 4—November 3 Enrollment accepted through September 8. Fee: \$625

**Section Number 5185.(808)** 

#### Java Programming, Comprehensive

CMPS.X471.2 (3.0 quarter units)

Java is the premier language for Web servers, enterprise servers, network applications, embedded devices, appliances and wireless applications. This course covers the Java fundamentals, including language syntax, constructs, and the development environment. It 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 controls and inheritance. Students build graphical user interfaces and program in the Java event-handling model. Additional topics include the Java class library, collection frameworks, Internet communication, and multithreaded programming.

Prerequisite(s): "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.

BINEET SHARMA, M.S.C.S.

CLASSROOM WITH ONLINE MATERIALS 10 meetings | 6:30–9:30 pm | June 28–August 30 Fee: \$1020.

Section Number 6634.(107)

RADHIKA GROVER, Ph.D.

ONLINE | June 16—September 15 Enrollment accepted through July 21. Fee: \$1020.

Section Number 6634.(807)

ONLINE | August 4—November 3 Enrollment accepted through September 8. Fee: \$1020.

Section Number 6634.(808)

## ACCESS TO ONLINE COURSES AND MATERIALS



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For more information, including help retrieving your account info, please visit

ucsc-extension.edu/online-faqs.

For information on textbooks, see page 92 or visit **ucsc-extension.edu/bookstore.** 

#### JUnit Test Framework

For course description, see page 77.

#### Object-Oriented Analysis and Design

For course description, see page 77.

#### Object-Oriented Development: Architectures and Design Patterns, Advanced

For course description, see page 77.

#### Perl Programming, Comprehensive

CMPS.X436.9 (2.0 quarter units)

This comprehensive hands-on course covers all the basic Perl syntax and programming constructs. Students will develop programs in class and as homework assignments. In addition to the basics, the course covers the file handle, filters, testing and system interface. It also includes an introduction to the object-oriented features in Perl, standard libraries, and how to package and modularize Perl programs. By the end of course, students should be able to develop sophisticated Perl scripts in several applications.

*Prerequisite(s):* Recent programming experience in any language is required.

LAMBERT LUM, B.S.C.S., M.B.A.

LAB WITH ONLINE MATERIALS 7 meetings | 6:30–9:30 pm | July 14–August 25 Fee: \$770.

Section Number 2110.(069)

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#### **Python for Programmers**

CMPS.X461.9 (3.0 quarter units)

Because of its clear and elegant syntax, dynamic typing, automatic memory management, and straight-forward module architecture, Python enhances program correctness and increases efficiency. Its code is easy to read, write, extend, and modify. This lab-based course builds proficiency in Python, and the skills and knowledge for creating applications using task-specific Python libraries. Topics include the Python environment and code introspection, syntax, flow control, function protocols, exception handling and functional programming. Also covered are object-oriented features, classes, inheritance and overriding as well as building applications, packages, and libraries.

*Prerequisite(s):* "Python Programming for Beginners." Significant experience in any programming language.

MARILYN DAVIS, Ph.D.

LAB WITH ONLINE MATERIALS 4 meetings | 9 am—5 pm | June 5—8 Fee: \$1020.

Section Number 3064.(131)

SRIDEVI PUDIPEDDI. Ph.D.

LAB WITH ONLINE MATERIALS 10 meetings | 6:30–9:30 pm | June 23–September 8 Fee: \$1020.

Section Number 3064.(132)

RAVISHANKAR CHITYALA, Ph.D.

LAB WITH ONLINE MATERIALS 10 meetings | 6:30–9:30 pm | June 28–September 6 Fee: \$1020.

Section Number 3064.(134)

MARILYN DAVIS, Ph.D.

LAB WITH ONLINE MATERIALS 4 meetings | 9 am—5 pm, August 14—17 Fee: \$1020.

Section Number 3064.(133)

ONLINE | June 16—September 15 Enrollment accepted through July 21. Fee: \$1020.

Section Number 3064.(807)

ONLINE | August 4—November 3. Enrollment accepted through September 8. Fee: \$1020.

Section Number 3064.(808)

#### Python Programming for Beginners

CMPS.X400.463 (1.5 quarter units)

This hands-on lab-based course is intended for newcomers to programming. The course covers the important concepts and programming mechanisms that exist in all programming languages: reading and writing to standard I/O, using operators, controlling the flow of execution, using functions, reading and writing files, and, object-oriented programming concepts, etc. It also includes Python specific facilities such as code re-use, built-in sequence types, and iteration. Interactions and expert help are available.

DONALD KEIDEL, Ph.D.

LAB WITH ONLINE MATERIALS 6 meetings | 6:30–9:30 pm | June 22–July 27 Fee: \$580.

Section Number 20776.(059)

SRIDEVI PUDIPEDDI. Ph.D.

LAB WITH ONLINE MATERIALS 6 meetings | 9:30 am-12:30 pm | July 18-August 22 Fee: \$580.

Section Number 20776.(060)

#### XML Essentials

CMPS.X468.4 (2.0 quarter units)

This course is an introduction to the power of XML and its importance to the Web. 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 Document Object Model (DOM) concept and the data manipulation capability.

*Prerequisite(s):* Web page creation skills and a basic understanding of cascading style sheets.

AHMAD NOURI, M.S.

ONLINE | June 16–September 15 Enrollment accepted through July 21. Fee: \$625.

Section Number 3279.(807)

ONLINE | August 4—November 3 Enrollment accepted through September 8. Fee: \$625.

**Section Number 3279.(808)** 



#### CERTIFICATE PROGRAM

#### Internet Programming & Development

#### PROGRAM SUMMARY

Keep pace with the rapid evolution of Web technologies by studying with the experts at UCSC Extension. Our Internet Programming and Development certificate program offers comprehensive training geared to developers working on e-commerce, enterprise applications, interactive websites and cloud applications. Courses cover 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. We offer training on Internet programming languages, server development, Rich Internet Applications (RIA) or dynamic Web technologies, and cloud services. Our Web app testing and e-commerce security courses are also relevant to industry professionals. Developers can acquire new skills through hands-on instruction and sharing insight with our expert instructors.

This program shares some courses with our certificates in Computer Programming, User Experience and Web Design, and Linux Programming. It is the one place where important Internet development and application programming courses are combined in a single, rich curriculum.

#### **CERTIFICATE REQUIREMENTS**

To obtain the Certificate in Internet Programming and Development, you must complete a minimum total of **14 units**, including one of the three core courses. One related outside elective or "Also of Interest" course may be counted in certificate upon approval.

#### PROGRAM AUDIENCE

This certificate program is for professionals who want to:

- Keep up with emerging Internet technologies
- Develop interactive and dynamic websites
- Develop enterprise and commercial applications
- Study for Java EE and ASP.NET certifications
- Enter the field of Internet programming and development with confidence

#### PREREQUISITES

Familiarity with a programming language is required. General knowledge of databases, browsers, and the Web is assumed.

#### RECOMMENDED COURSE SEQUENCE

Students should follow the recommended prerequisites or skills needed of each course. The sequence may vary based on student background and professional interest.

Some courses may be listed in more than one program. However, only one course may be shared between two Engineering and Technology certificate programs unless otherwise noted.

#### Courses

#### C# .NET Programming, Advanced

For course description, see page 70.

#### C# .NET Programming, Comprehensive

For course description, see page 70.

#### **Cloud Computing, Introduction**

CMPS.X400.527 (0.5 quarter units)

This course introduces students to the concepts and technologies involved in cloud computing, which refers to scalable and virtualized computing over the Internet. The course begins with surveys of technologies deployed by Amazon, Google, Microsoft, and various academic and open-source providers. It explains how cloud computing services can provide on-demand access to data storage, computing resources, and messaging. It also introduces the enabling technologies: Web 2.0, virtualization, grid and utility computing that comprise the infrastructure behind a cloud computing service. The course examines various case studies and technical-business models.

Prerequisite(s): A basic understanding of the Internet, databases, messaging and programming experience sufficient to follow code examples.

JEFF MILLER, B.S.

CLASSROOM WITH ONLINE MATERIALS 1 meeting | 10 am—5 pm | June 10 Fee: \$350.

**Section Number 22413.(017)** 

#### Designing with Cascading Style Sheets: Advanced

For course description, see page 82.

#### Designing with Cascading Style Sheets: Fundamentals

For course description, see page 82.

#### Designing, Building and Integrating RESTful API

CMPS.X400.007 (2.0 quarter units)

Databases, websites, and business applications exchange data. This course introduces data exchange topics with a focus on the RESTful API, starting with common data formats and the HTTP mechanism. You will compare SOAP and Representational State Transfer (REST). The course also covers software API design, RESTful API, and implementations of the JAX-RS standard. You will learn how to integrate RESTful API with relational databases, NoSQL databases, and REST wrappers for SOAP. For your class project, you will complete a design review of publicly available APIs.

Prerequisite(s): "Java Programming, Comprehensive." SANJAY PATNI, M.S.

CLASSROOM WITH ONLINE MATERIALS
7 meetings | 6:30–9:30 pm | July 21–September 8

Section Number 30406.(004)

Fee: \$760.

#### PROFESSIONAL AWARD

#### Mobile Application Development

#### AWARD SUMMARY

Mobile application development is attracting the attention of corporations, the media and most importantly, software developers. While our mobile courses appear in several traditional certificate programs, the Professional Award in Mobile Application Development is designed for those who are primarily interested in developing mobile apps. Courses include programming for the major mobile platforms, interface design and cross-platform programming. This award serves as recognition for students who have accumulated a focused body of knowledge in the field. It may help you pursue career opportunities in this growing industry.

#### AWARD REQUIREMENTS

To obtain the Professional Award in Mobile Application Development, you must successfully complete **8 units** with a minimum GPA of 3.0.

#### RECOMMENDED COURSE SEQUENCE

While courses can be taken based on individual interest and level of experience, you must meet the prerequisites of individual courses. Prerequisite language courses cannot be counted toward the award.

#### MOBILE DEVICE PROGRAMMING

Developing Applications for iPhone and iPad, Introduction **2.0 units** 

Developing Applications for iPhone and iPad, Advanced

Developing Applications for
Android Mobile Devices 2.0 units

Developing Applications for

Android Mobile Devices, Advanced 2.0 units

#### MOBILE INTERFACE DESIGN

Mobile Interface Design 3.0 units

Designing User Experience for Smart Things, VR, and Wearable Technology **3.0 units** 

#### MOBILE SYSTEM DESIGN

Wireless Communications and Mobile Antenna Design, Introduction **3.0 units** 

#### CLOUD PROGRAMMING AND MOBILE PAYMENT

Programming for Cloud Computing:
Amazon Web Services 3.0

3.0 units

Mobile Payments, e-Commerce Security, and Cryptocurrency

3.0 units

3.0 units

See ucsc-extension.edu/MobileAppsPA for details.



#### INTERNET PROGRAMMING AND DEVELOPMENT CERTIFICATE 14-unit minimum Units \*Choose one of these three core courses Working with the Web Designing, Building and Integrating RESTful API ......2.0 User Experience Design Fundamentals......3.0 Java EE Framework JavaScript Framework \*JavaScript and AJAX, Comprehensive ......3.0 Developing JavaScript-based Rich Web UI with JQuery......2.0 Web Application Development Using React, Redux and TypeScript ......2.0 Windows Framework Open Source Web Framework Ruby and Ruby on Rails ......2.0 Responsive Web Design with Open Source Frameworks ......2.0 **Internet Programming Languages** Java Programming for Beginners.....2.0 Perl Programming, Comprehensive......2.0

Certificate schedule outline of program curriculum and annual schedule are found online. From the homepage, select: "Area of Study"; department; then certificate title as listed above.



#### HTML Fundamentals

For course description, see page 82.

#### HTML5: The Living Language

For course description, see page 82.

#### Introduction to Web Programming: JavaScript and PHP

CMPS.X482 (2.0 quarter units)

This introductory course covers basic concepts and programming skills that you need to know to program dynamic Web pages. 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, expressions and operators, and strings. You'll discuss functions, events, decision making and repetition, and you'll learn to build forms and objects, take inputs and reset forms. When using PHP for server-side scripting, you'll also learn to handle user input and process form data, creating an all-in-one form.

Prerequisite(s): "Designing with Cascading Style Sheets: Fundamentals," and "HTML Fundamentals." 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 1500) instead.

TERESA HARDY, B.S., M.A.

LAB WITH ONLINE MATERIALS 8 meetings | 6:30–9:30 pm | July 5–August 30 Fee: \$710.

Section Number 30298.(012)

#### **Java Programming for Beginners**

For course description, see page 71.

#### Java Programming, Comprehensive

For course description, see page 71.

#### JavaScript and AJAX, Comprehensive

CMPS.X438.5 (3.0 quarter units)

This comprehensive course covers JavaScript as a programming language for creating dynamic Web pages. After getting up to speed with the language syntax, data types, operators, and programming constructs, you will learn how to create and manipulate objects and write functions to handle user-initiated events such as mouse rollovers, clicking on a link, or submitting a form. You will learn the Document Object Model and how to walk the W3C DOM tree, manage nodes, and use event listeners. Topics include JS frameworks and AJAX to create asynchronous calls to the Web for fast interactivity.

Prerequisite(s): "Introduction to Web Programming: JavaScript and PHP." Familiarity with basic programming constructs (of a language such as C, C++ or Perl) and a working knowledge of HTML are required.

VIVEK SHARMA, B.S.

LAB WITH ONLINE MATERIALS 10 meetings | 6:30–9:30 pm | June 19–August 28 Fee: \$960.

Section Number 1500.(069)

#### Linux Based Web Application Development - Apache, MySQL, PHP

For course description, see page 67.

#### Perl Programming, Comprehensive

For course description, see page 72.

#### Programming for Cloud Computing: Amazon Web Services

CMPS.X400.555 (3.0 quarter units)

Amazon Web Services (AWS) is the leading Infrastructure-as-a-Service (IaaS) cloud provider. This 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. You will gain hands-on experience through a class project that involves designing, coding, and deploying a cloud-focused tool or application. This course covers the concepts and programming techniques used by both IT professionals and application developers.

Prerequisite(s): "Cloud Computing, Introduction." Experience developing programs in any of Python, Perl, Java, C# or Ruby.

JEFF MILLER, B.S.

CLASSROOM WITH ONLINE MATERIALS 10 meetings | 7–10 pm | June 22–August 31 Fee: \$910.

Section Number 23094.(016)

#### **Python for Programmers**

For course description, see page 72.

#### **Python Programming for Beginners**

For course description, see page 72.

#### Web Application Development Using React, Redux and TypeScript

CMPS.X400.010 (2.0 quarter units)

This course covers React, Flux, Redux and TypeScript in detail for developing highly interactive Web applications that are scalable and communicate with the server using RESTful API. In the course you will use React as a UI engine to build composable rich user interfaces from smaller components; use Flux as an architectural pattern to build scalable Web apps that complement React; use Redux as the framework that implements Flux architectural patterns, and TypeScript to then make your JavaScript scalable. This is a hands-on coding class where you will learn to build an app using React's component-based composable user interface development approach, implement complicated interactive web applications with the backend support using Redux and make them scalable using TypeScript.

Prerequisite(s): "JavaScript and AJAX, Comprehensive." Programming experience with client-side JavaScript, AJAX, and basic understanding of HTML and CSS.

MIN WU. Ph.D.

CLASSROOM WITH ONLINE MATERIALS
7 meetings | 6:30–9:30 pm | July 11–August 22
Fee: \$770.

Section Number 30450.(003)

#### Web Framework Using JavaScript: The MEAN Stack

CMPS.X400.580 (3.0 quarter units)

The MEAN stack (MongoDB, ExpressJS, AngularJS, and Node.js) is an emerging Web framework that uses JavaScript to build Web applications from front to back. This course explains the four components and the role each has in building a modern 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. Additionally, you'll interact with JSON, Model-View-Controller, Web services and HTML.

Prerequisite(s): "JavaScript and AJAX, Comprehensive." VIVEK SHARMA, B.S., M.S.

CLASSROOM WITH ONLINE MATERIALS 10 meetings | 6:30–9:30 pm | June 22–August 24 Fee: \$980.

Section Number 30377.(008)

#### Web Technologies, Introduction

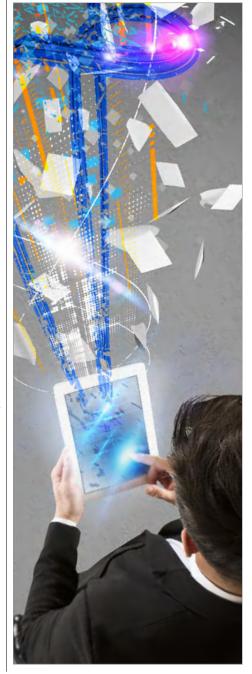
For course description, see page 83.

#### XML Essentials

For course description, see page 72.

#### **ENROLL EARLY!**

Enroll at least seven days prior to your course's start date to save your seat and allow time to prepare for the first class meeting. Enrolling early also helps ensure that your course is not cancelled due to low enrollment.



#### CERTIFICATE PROGRAM

#### Software Engineering and Quality

#### PROGRAM SUMMARY

The Software Engineering and Quality certificate program is designed for software professionals who want to grow expertise and broaden skills beyond coding and programming. It blends foundation-level course work in software engineering with the latest developments in software quality, testing, and user-experience design. These essential topics are not commonly covered in traditional programming curriculum. Established and aspiring engineers will develop new skills, gain insight into the emerging technologies, and learn from our expert faculty. Software developers, testers, QA professionals, UX designers, architects, and project leaders will find that this certificate program provides the next level training they need for career growth. This unique program brings together software engineering, testing, and user-experience design courses under a single umbrella.

- Software Engineering courses cover software architecture and software system modeling.
- Quality and Testing offers courses in the software test automation and quality assurance methods.
- User Experience Design courses cover the practices and methods required to create successful user experience for software across various platforms.

#### CERTIFICATE REQUIREMENTS

To obtain the Certificate in Software Engineering and Quality, you must complete a minimum total of 14 units which must include one of three core courses. One related outside elective or "Also of Interest" course may be counted in certificate upon department approval.

For additional requirements, go to ucsc-extension.edu.

#### PREREQUISITES

You will need a degree in a technical field or equivalent knowledge acquired through training and experience in software development or product design. Experience with a programming language is required for the software engineering and testing/QA tracks of study. Some programming courses are available as electives in this program.

#### RECOMMENDED COURSE SEQUENCE

Students should follow the recommended prerequisites or skills needed of each course. The sequence may vary based on student background and professional interest.

Some courses may be listed in more than one program. However, only one course may be shared between two Engineering and Technology certificate programs unless otherwise noted.

#### SOFTWARE ENGINEERING AND QUALITY CERTIFICATE

#### 14-unit minimum

\*Choose one of these three core courses

Units

#### Software Engineering

\*Object-Oriented Analysis and Design.......3.0 Data Structures and Algorithms Using Java ......3.0 Designing, Building and Integrating RESTful API......2.0 

#### **Software QA and Testing**

\*Software Quality Assurance and Testing......2.0 Software Testing: Techniques, Tools and Practices......3.0 

#### **User Interface Design**

Designing User Experience for Smart Things, Virtual Reality, and Wearable Technology............3.0

#### Pofrachar for Software Professionals

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

Certificate schedule outline of program curriculum and annual schedule are found online. From the homepage, select: "Area of Study"; department; then certificate title as listed above.

#### **EARN CREDIT TOWARD** AN M.S. IN ENGINEERING

The Engineering and Technology Department has secured a transfer agreement with the University of Wisconsin-Platteville. This agreement specifically assists students who have completed either an Embedded Systems Certificate or a Software Engineering and Quality Certificate, and would like to pursue an online Master of Science in Engineering degree. Applicants to the master's degree program must hold a bachelor's degree from an accredited institution and fulfill the school's admissions requirements.



#### Courses

#### C Programming for Beginners

For course description, see page 70.

#### C# .NET Programming, Comprehensive

For course description, see page 70.

#### Computational Intelligence, Introduction

For course description, see page 70.

#### Data Structures and Algorithms Using Java

For course description, see page 71.

#### Designing, Building and Integrating RESTful API

For course description, see page 73.

#### Introduction to Machine Learning and Data Mining

For course description, see page 79.

#### Introduction to Web Programming: JavaScript and PHP

For course description, see page 74.

#### **Java Programming for Beginners**

For course description, see page 71.

#### JUnit Test Framework

CMPS.X460.8 (1.5 quarter 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

Prerequisite(s): "Java Programming for Beginners." The assignment requires coding in Java. The course will not repeat Java programming instructions.

AHMAD NOURI, M.S.

CLASSROOM AND ONLINE (HYBRID)
3 meetings | 6:30–9:30 pm | July 14–August 11
Fee: \$650.

Section Number 6198.(041)

#### **Mobile Interface Design**

For course description, see page 83.

#### **Object-Oriented Analysis and Design**

CMPS.X431.2 (3.0 quarter units)

Object-oriented design involves transforming the descriptive analysis models into computational models for coding. During an object-oriented analysis, a descriptive model of the problem domain is developed. Instruction uses the notation specified by the Unified Modeling Language (UML). Students will learn Agile and Iterative Development methodologies and use case design and requirements driven design. 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 documenting design using different UML diagrams.

Prerequisite(s): Programming experience required in an object oriented language. e.g. Java, C++, C#, Python, etc.

EDWIN MACH, M.S.

ONLINE | June 16—September 15 Enrollment accepted through July 21.

Section Number 0774.(802)

ONLINE | August 4—November 3 Enrollment accepted through September 8. Fee: \$980.

Section Number 0774.(803)

#### Object-Oriented Development: Architectures and Design Patterns, Advanced

CMPS.X470.9 (3.0 quarter units)

This course will equip you with an arsenal of software design and architecture skills. After presenting an overview of how object-oriented design fits into the software development process, you'll learn to assemble systems from components using architectural patterns such as Model-View-Controller, Component-Container, Client-Server, and Agent-Based. The course then delves into 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.

Prerequisite(s): Knowledge of object-oriented development, including UML notation, and familiarity with an object-oriented language such as Java or C++.

HINKMOND WONG, M.S.

CLASSROOM WITH ONLINE MATERIALS 10 meetings | 6:30–9:30 pm | June 29–August 31 Fee: \$980.

Section Number 6633.(036)

#### Perl Programming, Comprehensive

For course description, see page 72.

#### Python Programming for Beginners

For course description, see page 72.

#### Relational Database Design and SQL Programming

For course description, see page 80.

#### Software Quality Assurance and Testing

CMPS.X418.1 (2.0 quarter 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 measurement; software development, Total Quality Management, and risk management.

ALKA JARVIS, M.B.A.

CLASSROOM WITH ONLINE MATERIALS 7 meetings | 6:30–9:30 pm | July 11–August 29 Fee: \$735.

Section Number 3396.(056)

#### Software Testing: Techniques, Tools and Practices

CMPS.X400.435 (3.0 quarter units)

This course provides an overview of software testing and emphasizes practices, techniques and tools. You will learn the essential testing methodologies, including black box and white box testing in the evolving Agile/Scrum model. The course covers source code management and test practices for unit and functional tests, as well as test and code coverage strategy and tools. Course topics include defect tracking, reporting, test case management, and Test Driven Development and Behavior Driven Development methodologies. The course introduces several open-source tools frequently used in the industry for hands-on exercises.

*Prerequisite(s):* Some coding knowledge of Python and Java, C++ or C# is required.

MAZEDUR RAHMAN, M.S.

LAB WITH ONLINE MATERIALS

10 meetings | 2–5 pm | July 29;
and 10 am–1 pm | June 24–September 9

Section Number 20501.(024)

#### User Experience Design, Advanced

For course description, see web site.

#### CERTIFICATE PROGRAM

#### Database and Data Analytics

#### PROGRAM SUMMARY

UCSC Extension's certificate in Database and Data Analytics consists of two fields of study:

- The Database focus is designed for enterprise data professionals who are involved in designing, administering and using shared databases, including building business intelligence.
- The **Data Analytics** focus offers a comprehensive introduction to the field, including the algorithms, tools, frameworks and practices in managing Big Data and performing data mining.

The industry of business intelligence and analytics has undergone major shifts in fundamental technologies. This certificate program offers up-to-date training for data scientists, analysts, administrators and managers who want to apply analytics to business decision-making. Expert instructors present the latest technologies and developments through a hands-on approach to facilitate learning.

#### CERTIFICATE REQUIREMENTS

To obtain the Certificate in Database and Data Analytics, you must complete a minimum total of **14 units** including one of two core courses. For additional requirements, visit our website. One related outside elective or "Also of Interest" course may be counted in certificate upon department approval.

#### PREREQUISITES

Each course has different prerequisites. Please review the course descriptions on our website to ensure that you meet the requirements, whether through education or job experience. Programming knowledge is helpful.

#### RECOMMENDED COURSE SEQUENCE

We recommend that students begin with one of the two core courses, and follow the recommended prerequisite for each course. The sequence may vary based on student background and professional interest.

#### View each courses' full schedule online at ucsc-extension.edu

#### DATABASE AND DATA ANALYTICS CERTIFICATE

#### 14-unit minimum

*Choose one of these two core courses	Course
Oracle Database	
*Relational Database Design and SQL Programming	3.0
Oracle PL/SQL, Introduction	2.0
Oracle 12c: Enterprise Architecture and Administration on Linux	3.0
Oracle 12c: Administration on Linux II	3.0
Database Development	
MySQL Database for Developers and Designers	
Linux Based Web Application Development—Apache, MySQL, PHP	3.0
Designing, Building and Integrating RESTful API	2.0
Database Warehouse and Business Intelligence	
Data Modeling, Introduction	3.0
Business Intelligence Solutions	2.0
Dashboards and Data Visualization	2.0
Data Science and Data Mining	
*Data Analysis, Introduction	3.0
Machine Learning and Data Mining, Introduction	
Predictive Analytics: Applications of Machine Learning	
Big Data	
Big Data: Overview, Tools and Use Cases	3.0
Hadoop: Distributed Processing of Big Data	
Apache Spark with Scala, Introduction	
NoSQL Databases, Introduction	
Hadoop Analytics: A Case-Study Approach	3.0
The Internet of Things: Big Data Processing and Analytics	

Certificate schedule outline of program curriculum and annual schedule are found online. From the homepage, select: "Area of Study"; department; then certificate title as listed above.

#### Courses

#### Big Data: Overview, Tools and Use Cases

CMPS.X460.367 (3.0 quarter units)

Big Data has emerged as a powerful new technology paradigm. In order to manage the massive data generated by social media, online transactions, Web logs, and sensors, Big Data has to incorporate innovative technologies in data management. This course provides an overview of Big Data concepts, its technological landscape and deployment patterns. You will learn data management, including how to acquire, cleanse and normalize Big Data, and discuss practical use cases. The course explores the key concepts, schema, data access and methodology of NoSQL, a database management system designed to handle Big Data. You will also learn the technology infrastructure, Hadoop and SMAO (Storage, MapReduce and Query) stacks in Big Data. The course concludes with Data Visualization Tools (DVT), analytics tools, and deployment patterns in various industries.

ALAKH VERMA, M.S.

CLASSROOM WITH ONLINE MATERIALS 10 meetings | 6:30–9:30 pm | June 27–September 5 Fee: \$910.

Section Number 30122.(015)

#### **Business Intelligence Solutions**

CMPS.X434.81 (2.0 quarter units)

This course takes a hands-on approach to the fundamentals of business intelligence, using the Microsoft BI stack as an example. You will learn the features of PivotTables, Power Pivot and Power View, including how to load data from SQL Server and create Power View dashboards, charts and maps. You will use Visual Studio to build an Online Analytical Processing (OLAP) cube and dimensions. You'll also learn to use SQL Server Analysis Services (SSAS), Integration Services, and Reporting Services. The course is intended for BI developers and analysts.

Prerequisite(s): "Relational Database Design and SQL Programming."

VICTOR EYDUS, Ph.D.

LAB WITH ONLINE MATERIALS

8 meetings | 6:30–9:30 pm | May 30–July 25 Fee: \$740.

**Section Number 30322.(007)** 

#### Dashboards and Data Visualization

CMPS.X481 (2.0 quarter units)

This course introduces dashboard and data visualization technologies with a hands-on approach. You will identify and design key performance indicators (KPIs), learn the principles of data visualization, and design and implement dashboards and scorecards. Other topics include identifying and selecting dashboard software tools, 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 results on the dashboard. Your grade will be based on a course project, in-class participation, a midterm and a final exam.

The Tableau software is available to students for learning purposes only for approximately three months. Students are required to install software on own computers and are encouraged to bring laptops to class.

*Prerequisite(s):* Knowledge of database concepts and any business experience related to decision-making.

PARTHASARATHY PADMANABHAN, M.B.A.

CLASSROOM WITH ONLINE MATERIALS 7 meetings | 6:30–9:30 pm | July 21–September 8 Fee: \$740.

Section Number 30282.(006)

#### Data Modeling, Introduction

CMPS.X470.8 (3.0 quarter units)

Data modeling defines and applies structure to the information systems in an enterprise, allowing data to flow across the enterprise, departments, or business areas. This course provides in-depth knowledge and hands-on practice in data modeling and design. After introducing the concepts and principles of data modeling, the course covers data modeling techniques and practices in four modeling areas: conceptual, logical, physical, and dimensional. You will study real-world examples of data models for transactional systems, data marts and enterprise data warehouses.

*Prerequisite(s):* "Relational Database Design and SQL Programming" or an equivalent course.

PARTHASARATHY PADMANABHAN, M.B.A. RAVIKUMAR NANDAGOPALAN, M.B.A.

LAB WITH ONLINE MATERIALS 10 meetings | 6:30–9:30 pm | July 11–September 12 Fee: \$910.

Section Number 2957.(015)

#### Designing, Building and Integrating RESTful API

For course description, see page 73.

#### Hadoop Analytics: A Case-Study Approach

CMPS.X400.011 (3.0 quarter units)

The analytic tools for Hadoop form a principal platform for the next generation of data analysis. This course provides an introduction to Hadoop analytical tools. We will use case studies from computational biology and quantitative finance to explore methods for delving into the data using Hive, Pig, SparkSQL, SparkML and R. The course focuses on creating a workflow to produce practical insights. You will learn to apply machine learning algorithms to massive datasets without programming, as well as how to apply R to statistical analysis of Big Data on Hadoop.

Prerequisite(s): Experience with SQL and R is required. SQL and R will not be taught in this course. Some knowledge of Hadoop and Spark are recommended but not required. Basic understanding of DNA sequencing and stocks will be helpful.

ELIZABETH COREY, M.S., Ph.D.

CLASSROOM WITH ONLINE MATERIALS 10 meetings | 6:30–9:30 pm | June 26–August 28 Fee: \$960

Section Number 30475.(003)

#### Hadoop: Distributed Processing of Big Data

CMPS.X440.020 (3.0 quarter units)

Hadoop is an open-source platform for distributed processing of large amounts of data across clusters of servers. This course provides an overview of the MapReduce frameworks and Hadoop Distributed File System (HDFS). You will learn how to write MapReduce code and optimize data processing applications. The course also covers Hadoop's ecosystem, including the data warehouse and query service Hive, important libraries for SQL processing and machine learning, distributed scalable NoSQL databases, and the distributed processing coordination system Zookeeper. The course consists of interactive lectures, lab exercises and programming assignments.

Prerequisite(s): "Java Programming, Comprehensive" or equivalent experience with Java Programming is required for this course. Assignments need to be written in Java. An understanding of database, SQL, parallel or distributed computing is recommended.

ELIZABETH COREY, M.S., Ph.D.

LAB WITH ONLINE MATERIALS 10 meetings | 6:30–9:30 pm | June 28–August 30 Fee: \$960.

Section Number 30088.(030)

## Extract Data from Source System Transform Data for Target System Load Data into Target System Validate Data Loads Validate Data Loads

#### Introduction to Apache Spark with Scala

CMPS.X400.581 (3.0 quarter units)

Apache Spark is the latest data processing engine that supports batch, interactive, iterative and graphing data processing. Its elegant APIs and fast computing system makes it attractive for companies to leverage for data processing. This course introduces its architecture, the execution model. It includes a short introduction to the functional programming language Scala. You'll learn how to manipulate Apache Spark's programming model Resilient Distributed Dataset (RDD) through its APIs for data processing and how to build Spark applications with Scala. The course covers its stream processing capability and how to develop streaming applications with Apache Spark.

Prerequisite(s):" Java Programming, Comprehensive." Programming experience with Java is required. Knowledge of Hadoop is recommended.

HIEN LUU, M.S.

LAB WITH ONLINE MATERIALS 10 meetings | 6:30–9:30 pm | June 20–August 29 Fee: \$980.

Section Number 30389.(007)

#### **Introduction to Data Analysis**

CMPS.X471.7 (3.0 quarter units)

This course examines different approaches to a data analysis project, with a framework for organizing an analytical effort. R will be used primarily in class examples to carry out analysis. The course covers how to obtain and manipulate the raw data for use. It covers 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.

Prerequisite(s): 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).

PRAMOD GUPTA, Ph.D.

CLASSROOM WITH ONLINE MATERIALS 10 meetings | 6:30–9:30 pm | June 22–August 24

Section Number 30211.(014)

#### Introduction to Machine Learning and Data Mining

CMPS.X470.3 (3.0 quarter units)

In this course, you will learn machine learning concepts, terms and methodology. 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 as well as learning algorithms including expectation maximization and k-means clustering. The course uses examples of algorithms to guide you through foundational concepts and gain intuitive understanding of the mathematics underlying them. You will also build actual applications. The course concludes with the application of neural networks in machine learning.

Prerequisite(s): Moderate level of computer programming ability (Python, R, C++, Java, or Matlab), and elementary understanding of probability and statistics.

SHASHI SATHYANARAYANA, Ph.D.

CLASSROOM WITH ONLINE MATERIALS 10 meetings | 6:30–9:30 pm | June 22–August 31 Fee: \$950.

Section Number 2612.(020)

#### Introduction to NoSQL Databases

CMPS.X480.2 (3.0 quarter units)

This course gives you a hands-on overview of the two most popular NoSQL databases, MongoDB and Cassandra. It 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 complete a course project that involves setting up, populating, and using a NoSQL of your choice. By the end of the course, you will understand NoSQL concepts and learn to use popular NoSQL databases.

Prerequisite(s): 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.

JEFF MILLER, B.S.

CLASSROOM WITH ONLINE MATERIALS 10 meetings | 11 am-3 pm | June 24-August 26

Section Number 30213.(011)

#### Linux Based Web Application Development - Apache, MySQL, PHP

For course description, see page 67.

#### Predictive Analytics: Applications of Machine Learning

CMPS.X400.2 (3.0 quarter units)

The course provides a broad introduction to machine learning methods including regression, classification, clustering and recommender systems, and their application to practical scenarios. The course reviews the steps involved in building predictive models, including data collection, feature selection, algorithms, and evaluation. You will learn how to fine tune the performance of these predictive models, and plan for practical implementation issues. Important topics will be demonstrated using real-world applications and case studies. This course includes hands-on exercises and a project.

Prerequisite(s): "Introduction to Data Analysis." Some programming experience is recommended. R will be used in class examples, and Python experience can be helpful. Basic knowledge of probability and statistics is required. Prior machine learning knowledge is recommended but not required.

PRAMOD GUPTA, Ph.D.

CLASSROOM WITH ONLINE MATERIALS 10 meetings | 6:30–9:30 pm | June 20–August 29 Fee: \$950

Section Number 30331.(010)

#### Relational Database Design and SQL Programming

CMPS.X480.3 (3.0 quarter units)

This course covers the concepts and design for Relational Database Management Systems (RDMS) and the Structured Query Language (SQL) needed to define and manipulate data. You will learn how to create conceptual, logical and physical designs of relational databases. You will use an Oracle database to design the entity-relationship diagrams (ERD) and implement a working database. The course covers 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.

Prerequisite(s): Familiarity with general database concepts and ability to install software or databases on a personal computer.

NIKET PATWARDHAN, M.S.

LAB WITH ONLINE MATERIALS 10 meetings | 6:30–9:30 pm | June 19–August 28 Fee: \$910.

Section Number 30215.(036)

ONLINE | June 16—September 15 Enrollment accepted through July 21. Fee: \$910.

Section Number 30215.(806)

ONLINE | August 4—November 3 Enrollment accepted through September 8.

Section Number 30215.(807)

#### Also of Interest

#### **Java Programming for Beginners**

For course description, see page 71.

#### Java Programming, Comprehensive

For course description, see page 71.

#### Python for Programmers

For course description, see page 72.

#### Python Programming for Beginners

For course description, see page 72.

#### **XML Essentials**

For course description, see page 72.

## User Experience and Web Design

#### CERTIFICATE PROGRAM

## User Experience and Web Design

(Formerly Web and Interactive Media Design.)

#### PROGRAM SUMMARY

As Web, mobile and software applications become ever more dynamic and interactive, users want these products to be intuitive and easy to use, while businesses demand positive customer analytics to justify the design investment. Designers have to learn to study customer behavior and communicate designs with team members on the same project. The professional User Experience and Web Design program at UCSC Extension equips you to meet the demands of a changing industry. The newly revised curriculum offers three tracks that cover the skills you'll need to compete, including:

- Visual design
- User experience design
- Design implementation
- Site management

Each track offers a strong foundation in the skills you need to pursue industry jobs.

#### CERTIFICATE REQUIREMENTS

To obtain the Certificate in User Experience and Web Design, you must complete a minimum of **17 units** including two core courses and the required final design project.

#### PREREQUISITES

There are no formal prerequisites to enter the certificate program. However, you should be proficient in Adobe Illustrator and Adobe Photoshop as they are the foundation in handling image and high fidelity graphics. For those in need of these skills, we offer introductory courses in both products. These two recommended prerequisites do not count toward the total number of units required for the certificate and may be satisfied with equivalent experience. We also recommend "Graphic Design Fundamentals" as a prerequisite for students who do not have a background in graphic design.

#### RECOMMENDED COURSE SEQUENCE

Depending on your previous experience in User Experience and Web Design, most courses may be taken in any order, provided the individual course prerequisites have been fulfilled. All students should complete the certificate with "Capstone User Experience Design Project". New students should attend the Information Session to receive course sequence information.

For additional information, go to ucsc-extension.edu/web.

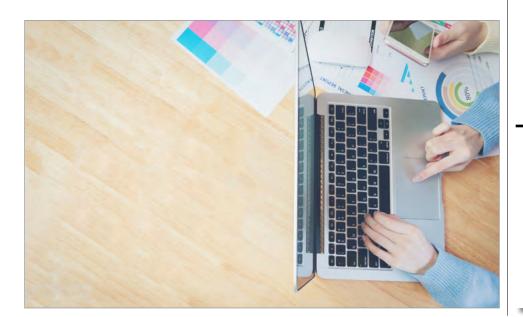
#### **USER EXPERIENCE AND WEB DESIGN CERTIFICATE**

17-unit minimum (Certificate students should complete two of the core courses\*\*, and the required final design project.)

RECOMMENDED PREREQUISITE COURSES	Units	Course
Adobe Illustrator, Introduction*		1.5
Adobe Photoshop, Introduction*		1.5
*The Illustrator and Photoshop Introduction courses may not be	applied toward the	certificate.

COURSES	Units
** Visual Design for the Interactive Web Graphical Production for the Web	
User Experience Design, Advanced Mobile Interface Design	
** HTML Fundamentals  ** Designing with Cascading Style Sheets: Fun Introduction to Web Programming: JavaScri Designing with Cascading Style Sheets: Adv HTML5: The Living Language	
** Introduction to Website Hosting and Optimi Building E-Commerce Websites with Wordpo	zation
<b>Design Project</b> ** Capstone User Experience Design Project	2.0

Certificate schedule outline of program curriculum and annual schedule are found online. From the homepage, select: "Area of Study"; department; then certificate title as listed above.



## INFO SESSION

#### User Experience and Web Design



This free event is an informal information session for new or returning students

who are interested in the User Experience and Web Design Program. This event includes a short overview of Extension and our certificate programs. In addition to general Q&A, program staff will be available to answer your questions, help you select courses and plan a course sequence. To ensure a successful experience studying with us, we strongly encourage you to attend the relevant Info Session prior to enrolling. Enroll early to reserve your space.

AUDREY BLUMENEAU, M.Ed. ALP TIRITOGLU, M.F.A.

#### CLASSROOM

1 meeting | 6:30–8:30 pm | June 7 No fee, but enrollment is required.

Section Number 22405.(022)

#### CLASSROOM

1 meeting | 6:30–8:30 pm | August 23 No fee, but enrollment is required.

**Section Number 22405.(025)** 

## ACCESS TO ONLINE COURSES AND MATERIALS



If you are enrolling for the first time in an Online course, or a classroom course with Online Materials, you will receive an account for UCSC Extension Online via email within 12 hours. If you have previously taken a course with online materials, you should use your existing account. Course sites will open one day prior to the official start date.

For more information, including help retrieving your account info, please visit ucsc-extension.edu/online-faqs.

For information on textbooks, see page 92 or visit **ucsc-extension.edu/bookstore.** 

#### Recommended Prerequisites

#### Adobe Photoshop, Introduction

ART.X499.16 (1.5 quarter units)

This course introduces the basics of Photoshop CC, the industry standard for the creation, enhancement and manipulation of digital images. The course is designed for beginners and taught with lectures, demonstrations, hands-on work, critiquing and troubleshooting in a lab setting. You will be introduced to the Photoshop interface and its dense menu options, plus you will learn to use the tools for basic image editing, photo retouching, painting, creating composite images and working with type. The course also covers basic color theory, workflow methodology, creating custom shapes and joining Photoshop elements to create composite images.

*Prerequisite(s):* Familiarity with the Mac OS environment.

JEANETTE SMITH, B.A.

LAB WITH ONLINE MATERIALS 6 meetings | 6:30–9:30 pm | June 20–August 1 Fee: \$550.

Section Number 5307.(152)

#### Courses

#### Building E-Commerce Websites with Wordpress

CMPS.X400.542 (2.0 quarter units)

This course focuses on Wordpress, one of the most popular open-source content management systems. Discussions address real-life use cases to guide you through the planning and implementation phases of setting up a Wordpress-driven e-commerce site. You will learn how to install, configure, customize and test products, shopping carts and checkout pages via hands-on exercises and assignments. Topics include security, user permissions, content creation and management best practices. By the end of the course, you should be able to use Wordpress to build a fully-functioning online store

Prerequisite(s): "Graphical Production for the Web," "Designing with Cascading Style Sheets: Fundamentals," "HTML Fundamentals" and "Introduction to Website Hosting and Optimization." Foundation courses of the Web Design program. See "Skills Needed" on the Web for details.

VICKI WINTERS, M.A.

LAB WITH ONLINE MATERIALS
7 meetings | 6:30–9:30 pm | July 10–August 21
Fee: \$620.

Section Number 30451.(004)



#### Capstone User Experience Design Project

FILM.X402.7 (2.0 quarter units)

This final course in the User Experience and Web Design certificate program provides the opportunity to complete the entire process of developing a fully functioning website or a functioning front-end Web app interface for an actual client of your choosing. This includes a needs analysis, a visual design and the actual deployment. You are expected to demonstrate the range of skills and knowledge that you have acquired, including information architecture, user experience design, visual design, HTML5, CSS3 and JavaScript as needed. Design framework and prototyping tools may be used upon approval.

Prerequisite(s): "Graphical Production for the Web," "Graphic Design Fundamentals," "Designing with Cascading Style Sheets: Fundamentals" and "HTML Fundamentals." User Experience and Design Implementation courses or equivalent experience are required.

TERESA HARDY, B.S., M.A. LORI ANN NEUMANN, B.A.

LAB WITH ONLINE MATERIALS 8 meetings | 6–9 pm | July 21–September 29 Fee: \$720.

Section Number 30490.(003)

#### Designing with Cascading Style Sheets: Advanced

CMPS.X400.477 (2.0 quarter 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. By the end of the course, you will 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.

Prerequisite(s): "Designing with Cascading Style Sheets: Fundamentals," and "HTML Fundamentals." It is required that students take the prerequisite courses or have equivalent experience. HTML and CSS basics will not be repeated in this course.

AUDREY BLUMENEAU, M.Ed.

LAB WITH ONLINE MATERIALS 4 meetings | 9 am–4 pm | August 19–September 16 Fee: \$680.

Section Number 21317.(019)

#### Designing with Cascading Style Sheets: Fundamentals

FILM.X406.4 (2.0 quarter units)

Cascading style sheets (CSS) is an essential and mandatory coding language for controlling the presentation of a modern website. Combined with proper HTML markup, CSS allows for precise control over a Web page's appearance without the use of tables. This beginning course will provide demonstration and hands-on exercises covering the application and syntax of CSS; hand-coding CSS properties for font, text formatting and backgrounds; the box model; creating vertical and horizontal navigation menus and two and three column page-layouts.

All techniques covered adhere to current CSS specifications.

*Prerequisite(s):* "HTML Fundamentals" or equivalent experience.

AUDREY BLUMENEAU, M.Ed.

LAB WITH ONLINE MATERIALS 4 meetings | 9 am—4 pm | July 8—29 Fee: \$660.

Section Number 6673.(050)

#### HTML Fundamentals

CMPS.X400.467 (2.0 quarter units)

In this hands-on course, students learn to code HyperText Markup Language (HTML) to meet the most current standards and practices of coding as set by the World Wide Web Consortium (W3C). It covers all the major topics of coding and validating HTML, including meeting accessibility mandates and improving search engine optimization (SEO). The course also examines the new elements introduced by HTML5. The course is for students who have not coded Web pages before as well as for those who would like to review and update their HTML coding skills.

Prerequisite(s): Ability to surf the Web, working knowledge of standard text editors like SimpleText, TextEdit, NotePad, WordPad, or BBEdit. Basic Web-development concepts are recommended.

AUDREY BLUMENEAU, M.Ed.

ONLINE | June 16—September 15 Enrollment accepted through July 21. Fee: \$660.

Section Number 20816.(807)

ONLINE | August 4—November 3 Enrollment accepted through September 8. Fee: \$660.

Section Number 20816.(808)

#### HTML5: The Living Language

CMPS.X430.246 (3.0 quarter units)

An increasing number of companies are using HTML5 to develop Web and mobile applications. This course demystifies 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'll 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.

*Prerequisite(s):* "Designing with Cascading Style Sheets: Fundamentals," and "HTML Fundamentals."

AUDREY BLUMENEAU, M.Ed.

ONLINE | June 16—September 15 Enrollment accepted through July 21. Fee: \$880.

Section Number 30046.(804)

ONLINE | August 4—November 3 Enrollment accepted through September 8. Fee: \$880.

Section Number 30046.(805)

#### Introduction to Web Programming: JavaScript and PHP

For course description, see page 74.

#### Introduction to Website Hosting and Optimization

FILM.X402.5 (1.0 quarter units)

This course covers the decision points and practical challenges of launching and administering a website, including how to choose a domain name and Web hosting platform. You will review and evaluate some popular e-commerce and content management systems. The course also covers the hands-on skills necessary to administer domains, monitor website performance with analytics, and get sites and pages listed by search engines. The course is for students interested in launching a website. Your hands-on assignments will require using cloud hosting services.

*Prerequisite(s):* "Web Technologies, Introduction," and "HTML Fundamentals."

VICKI WINTERS, M.A.

LAB WITH ONLINE MATERIALS 2 meetings | 9 am—4 pm | June 10—24 Fee: \$540.

Section Number 30452.(003)

#### **Mobile Interface Design**

CMPS.X460.368 (3.0 quarter units)

There are many mobile apps in the App Store, but only a limited number 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 10, Android Material Design, responsive/parallax design 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.

ERIC DORF, B.F.A., DMBA

LAB WITH ONLINE MATERIALS 6 meetings | 9 am-3 pm | July 8-August 19 Fee: \$880

Section Number 30126.(010)

#### Visual Design for the Interactive Web

ART.X400.286 (2.5 quarter units)

Following a standard user-centered design process, students 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.

Prerequisite(s): "Adobe Photoshop, Introduction" or equivalent experience is required. "Adobe Illustrator, Introduction" and "User Experience Design Fundamentals" are recommended. For those without a Graphic Design background we recommend "Graphic Design Fundamentals."

Prerequisite(s): "Adobe Photoshop, Introduction," "Adobe Illustrator, Introduction," "Graphic Design Fundamentals," and "User Experience Design Fundamentals for the Web."

LORI ANN NEUMANN, B.A.

LAB WITH ONLINE MATERIALS 8 meetings | 6:15–9:30 pm | June 22–August 10 Fee: \$700.

Section Number 30030.(012)

#### Web Application Development Using React and Flux

For course description, see web site.

#### Web Technologies, Introduction

CMPS.X400 (1.0 quarter units)

This course introduces many key Web technologies without delving into programming. It covers 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), content management systems, Internet security, e-commerce, databases, mobile device Web design, social networking, and cloud computing. By the end of the course, you'll have the knowledge you need to work with developers, designers, site administrators, and marketing professionals effectively.

Prerequisite(s): 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 "HTML Fundamentals."

TERRI FITZMAURICE, B.A.

CLASSROOM WITH ONLINE MATERIALS 4 meetings | 6:30–9:30 pm | August 2–23

Section Number 22623.(016)

#### **ENROLL EARLY!**

Enroll at least seven days prior to your course's start date to save your seat and allow time to prepare for the first class meeting. Enrolling early also helps ensure that your course is not cancelled due to low enrollment.







## Science Waits For No One

AUGUST 2015: NASA Veggie plant growth system "Outredgeous" red romaine lettuce harvest enjoyed by resident ISS astronauts.

What role will you play in the future of bioscience? From clinical trials to regulatory affairs, medical devices, biotech to bioinformatics, UCSC Silicon Valley Extension offers the training you need to monitor clinical trials, prepare for FDA audits, market medical devices, analyze biological data, or, who knows, grow crops in space. What are you waiting for?

Learn more about your UC in Silicon Valley at ucsc-extension.edu

BIOINFORMATICS | BIOTECHNOLOGY | CLINICAL TRIALS DESIGN AND MANAGEMENT MEDICAL DEVICES | REGULATORY AFFAIRS

## UCSC Extension Online

#### Learning Platform Is Flexible, Interactive.





**OUR ONLINE COURSES** have helped many busy professionals complete certificate programs and reach their career goals.

Our online courses offer the opportunity to study with accomplished instructors and prepare for career advancement. Our online courses may be eligible for your company's tuition reimbursement program.

#### WHAT TO EXPECT:

- Instructors are involved via discussion boards and/or email throughout your course.
- Courses have fixed start and end dates. In some cases, you can complete
  modules anytime within those dates. Assignments, exams and projects are
  usually due on specific dates. Check with the instructor.
- Students enrolling in one of these courses for the first time will be able to log in to the UCSC Extension Online Learning Center. However, access to course resources will be granted one day prior to the course's start date.
- When the course ends, you'll receive a grade—as with any Extension course.

#### HERE'S WHAT YOU'LL NEED:

- Our online courses are best viewed on a desktop computer.
   Tablets and handheld devices may be used, but are not recommended.
   For those taking Engineering and Technology courses, programming software is primarily Windows or Linux-based.
- SOME APPLICATIONS ARE AVAILABLE ON MAC OS.
- For some courses, you may need a PC on which additional software can be installed as recommended by the instructor.
- Online instructors may ask you to install software for programming projects. Most recommended software is open-source and commonly used in the industry. No purchase is required. Instructors will provide instructions for download and installation. Exceptions are noted in the full course descriptions on our website.

## Online Summer courses include:

#### **Biosciences**

#### **Bioinformatics Tools, Databases** and Methods

For course description, see page 12. ONLINE | June 16-September 28

#### Cellular Biology

For course description, see page 14. ONLINE | June 16—September 28

#### **Experimental Methods** in Molecular Biology

For course description, see page 12. ONLINE | June 16-September 28

#### Statistics

For course description, see page 12. ONLINE | June 16-September 28

#### Toxicology Basics for Biotechnology

For course description, see page 15. ONLINE | June 16-September 28

#### **Business and Management**

The following Business and Management certificates can be completed entirely online:

Project and Program Management See page 39.

Technical Writing and Communication See page 42.

#### Advanced Paralegal Certificate Course

For course description, see page 35. ONLINE | June 26-August 11 ONLINE | August 21–October 6

#### **Business Statistics II**

For course description, see page 29. ONLINE | June 27–September 15

#### Compensation Management

For course description, see page 34. ONLINE | June 9-August 4.

#### Content Management

For course description, see page 42. ONLINE | July 17-August 28

#### Creating the Successful Project Team

For course description, see page 41. ONLINE | July 18-August 22

#### Cross-Cultural Negotiation: Asian and **Western Business Environments**

For course description, see page 36. ONLINE | June 13-July 18

#### Grammar and Style for **Technical Communicators**

For course description, see page 42. ONLINE | June 19-September 11

#### Leading People Through Change

For course description, see page 34. ONLINE | June 9–23

#### Managing the Development of New Products

For course description, see page 41. ONLINE | June 20–July 25

#### Paralegal Core Certificate Course

For course description, see page 35. ONLINE | June 26–August 11 ONLINE | August 21–October 6

#### Principles of Marketing

For course description, see page 36. ONLINE | June 13-July 18

#### Product Management: Moving the Product to Market

For course description, see page 37. ONLINE | June 13-July 18

#### **Project Integration and Risk Management**

For course description, see page 39. ONLINE | June 13-August 24

#### Role of the Project Manager

For course description, see page 40. ONLINE | July 10-August 14

#### Writing Successful Instructions, Procedures and Policies

For course description, see page 42. ONLINE | June 4-July 17

#### XML for the Rest of Us

For course description, see page 43. ONLINE | July 17-August 14

#### **Fducation**

#### Becoming a Professional Educator: Special Populations and Healthy **Environments**

For course description, see page 46. ONLINE | June 29-August 26

#### **Cultural Proficiency**

For course description, see page 54. ONLINE | July 20-August 27

#### ECE 4: The Young Child in the Family and Community

For course description, see page 47. ONLINE | June 13–July 30

#### ECE 8: Child Health, Safety and Nutrition

For course description, see page 48. ONLINE | July 17—August 27

#### ECE 9: Language and Literacy for the Young Child

For course description, see page 48. ONLINE | May 16-June 25

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

For course description, see page 50. ONLINE | May 15-June 18

#### ECE 12: S/A of Early Childhood Centers, Part B

For course description, see page 50. ONLINE | June 19–July 23

#### ECE 13: S/A Adult Supervision and Mentorina

For course description, see page 50. ONLINE | July 24-August 27

#### English As a Second Language Through Music and Movement

For course description, see page 56. ONLINE | June 28-July 30

#### Introduction to Online Teaching

For course description, see page 54. ONLINE | June 19–July 30

#### Management of Clinical Practice

For course description, see page 52. ONLINE | July 17-September 3



#### Psychology of Human Learning

For course description, see page 52. ONLINE | May 22–June 25

#### Technology in Schools, Introduction (SB 2042 Standard 11)

For course description, see page 46. ONLINE | June 19–July 21

#### **Understanding Learning Differences**

For course description, see page 52. ONLINE | June 13–July 30

#### **Engineering and Technology**

The following Engineering and Technology certificates can be completed entirely online:

Computer Programming See page 68.

*Internet Programming and Development* See page 73.

Linux Programming and Administration See page 66.

#### C# .NET Programming, Comprehensive

For course description, see page 70.
ONLINE | June 16—September 15
ONLINE | August 4—November 3

#### C Programming, Advanced

For course description, see page 70.
ONLINE | June 16—September 15
ONLINE | August 4—November 3

#### C++ Programming, Comprehensive

For course description, see page 70. ONLINE | June 16—September 15 ONLINE | August 4—November 3

#### C Programming for Beginners

For course description, see page 70.
ONLINE | June 16—September 15
ONLINE | August 4—November 3

#### HTML5: The Living Language

For course description, see page 82. ONLINE | June 16—September 15 ONLINE | August 4—November 3

#### **HTML Fundamentals**

For course description, see page 82. ONLINE | June 16—September 15 ONLINE | August 4—November 3

#### Java Programming, Comprehensive

For course description, see page 71. ONLINE | June 16—September 15 ONLINE | August 4—November 3

#### **Java Programming for Beginners**

For course description, see page 71. ONLINE | June 16—September 15 ONLINE | August 4—November 3

#### Linux Based Web Application Development - Apache, MySQL, PHP

For course description, see page 67. ONLINE | June 16—September 15 ONLINE | August 4—November 3

#### Linux Kernel Architecture and Programming

For course description, see page 68.
ONLINE | June 16—September 15
ONLINE | August 4—November 3

#### Low-Power Design of Nano-Scale Digital Circuits

For course description, see page 63. ONLINE | June 16—September 15 ONLINE | August 4—November 3

#### Object-Oriented Analysis and Design

For course description, see page 77.

ONLINE | June 16—September 15

ONLINE | August 4—November 3

#### **Python for Programmers**

For course description, see page 72. ONLINE | June 16—September 15 ONLINE | August 4—November 3.

#### Relational Database Design and SQL Programming

For course description, see page 80.
ONLINE | June 16—September 15
ONLINE | August 4—November 3

#### TCP/IP Essentials

For course description, see page 66.
ONLINE | June 16—September 15
ONLINE | August 4—November 3

#### XML Essentials

For course description, see page 72. ONLINE | June 16—September 15 ONLINE | August 4—November 3







## International Students

#### Want to transition into the American job market?

Our certificate programs can help you launch your career in Silicon Valley and beyond.

Contact our international team to discover the benefits of enrolling as an international student, which include:

- · Obtaining a student visa
- Learning business and technology skills
- Gaining internship experience at a Silicon Valley company
- Becoming eligible for one year of work authorization via Optional Practical Training (OPT) after completing the program
- Networking with instructors and fellow students

Thousands of Silicon Valley professionals have studied with us and gone on to successful careers. You can too.



#### **APPLICATION DEADLINES**

#### **BEGIN YOUR STUDIES IN ANY QUARTER.**

International student applications must be submitted by the following dates:

Quarter	Quarterly Start/ End Dates	If you are IN THE U.S., forms are due:	If you are ABROAD, forms are due:
Winter	January 1-March 31	December 15	November 15
Spring	April 1–June 15	March 15	February 15
Summer	June 16-August 31	May 15	May 1
Fall	September 1- December 31	August 15	July 15



## Some of the most popular certificates for international students are:

- Business
- Computer Programming
- Database and Data Analytics
- Software Engineering
- Project and Program Management
- Marketing
- Human Resources
- Biotechnology
- TESOL

Programs that are conducted entirely online are not eligible for a student visa.

See Areas of Study Certificate list on page 3.

#### Where To Start:

Once you have applied and been accepted, UCSC Extension will issue you an **I-20**, which can be used for initial entry, transfer, change of status, or reinstatement applications.

#### Optional Practical Training (OPT)

After completing your certificate program, you can apply for **Optional Practical Training** (OPT). OPT is available to students who have maintained their student status for three consecutive quarters (approximately nine months), and successfully completed a certificate program. With OPT authorization, you can apply your high-quality education toward one year of work experience in the U.S.

Learn more at ucsc-extension.edu/international-program/about.

#### How to Apply

Details on how to apply can be found on our website at **ucsc-extension.edu/international.** 

Most students begin by setting up a meeting with one of our international student advisors.

#### Admission Requirements

- University diploma or equivalent
- ☐ English Proficiency Score (TOEFL 80 IBT, IELTS 6.5, TOEIC 760) or equivalent
- ☐ Bank statement (minimum \$25,000\*)
- Copy of passport
- Copy of visa (if applying in U.S.)
- ☐ Copy of Electronic I-94 (if applying in U.S.)
- ☐ Copy of I-20 (if transferring)

\*\$25,000 is the estimated cost of tuition and living expenses for one academic year.

#### Contact us at:

#### extensioninternational@ucsc.edu (408) 450-4945

Ray Porras

International Student Advisor

Kathy Harrington

International Student Advisor, OPT Specialist

Diane Johansen

International Student Advisor, Internship Coordinator

Michael Mrache

Director of International and Workforce Development

#### Internships

As an international student enrolled in a certificate program, you are eligible to enroll in an unpaid internship in your field of study and have two options:

- 1. Arrange your own internship and enroll for the internship course for \$200.
- Consult with the Internship Coordinator, who will provide outreach and support in securing an internship. There is an additional \$200 fee for this service which must be paid in advance. For details, email the Internship Coordinator at extensioninternational@ucsc.edu or call at (408) 450-4945.

You can earn a maximum of 3 units each quarter for an unpaid internship by enrolling in our internship course, "Business Practices for International Students." To receive 3 units you must volunteer a minimum of 90 hours during the quarter.

#### WHAT STUDENTS SAY



When I was looking for work, it really helped that I could list experience in the US.

SHYLA JAIN

Marketing student



The program showed me how to develop the marketing techniques I need.

**UTKU MAHINER** *Marketing student* 



I learned how to work and act in new environments, which has helped me so much.

#### **AFAG SHUKUROVA**

Project and Program Management student

## General Information & Academic Policy

#### What to consider—

#### INTERESTED IN ENROLLING IN...

(A) individual courses?

Before enrolling, verify that you meet any prerequisite requirements as listed in the catalog and online. Please be aware that certificates¹ have an overall higher GPA passing requirement.

or

(B) pursuing a certificate<sup>1</sup>?

Most certificates consist of required courses and a minimum number of elective courses or units, through which a program can be tailored to meet an individual's educational and career goals. Requirements for individual programs may vary. Please consult specific program descriptions for additional information.

#### In order to be eligible for a certificate,\* you must:

- complete all course work within three years of declaring candidacy;
- achieve an overall 3.0 grade-point average (GPA) for all courses applicable to the certificate;
- receive a letter grade of "C-" or better in all courses.

\*All courses applied to the certificate must have been successfully completed within five years.

#### OUR GPA CALCULATOR:

www2.ucsc.edu/gpacalc

#### **CERTIFICATE WITH HONORS**

Students who complete a certificate program with a grade-point average of 4.0 will earn a Certificate with Honors.

#### IN ORDER TO RECEIVE YOUR CERTIFICATE

To complete your certificate, you'll need to enroll in the Certificate Completion Review and pay a **\$75** administrative fee.

#### TAKE THE NEXT STEP

Once you have decided which course(s) to take, your next step is to review course schedules online and select available delivery mode. Modes include:

CLASSROOM ONLINE

HYBRID: MIX OF CLASSROOM AND ONLINE

#### How our system works—

#### **CERTIFICATES:**

- We encourage you to declare candidacy in a certificate program early in your studies. This ensures that curriculum changes subsequent to receipt of your application will not affect your course requirements. Candidates will be notified of updates or special opportunities related to their program. Certificate applications can be submitted online at ucsc-extension.edu.
- Verify that you meet the minimum prerequisite requirements before enrolling in a program or course. You can view prerequisites in the course descriptions, certificate requirements, and online. Prerequisites help to better ensure successful completion of courses.
- **3** See each certificate program requirement as outlined in each listing.
- Participating in these educational courses or programs does not in itself provide preference in admission to the University of California. Students interested in applying to UC should refer to the UC Admissions website (admission.universityofcalifornia.edu) or the admissions office of the UC campus they wish to attend for details about the admissions process.

#### **5 ENROLLMENT**—Process and Policy

Please enroll early as this helps ensure a place in the course you want, and fulfills minimum enrollment requirements. Because UCSC Extension is a 501c nonprofit, it is completely self-supporting, which means there are no public funds available. If a course cannot meet its minimum enrollment requirement, it must be cancelled. Unpaid auditing is not permitted. Should you need to delay enrollment, please call (408) 861-3700 and visit our website to check for possible changes. Enrollment confirmation is sent via email to students who have an email address on file. All fees must be paid at time of enrollment.

#### 6 ONSITE TECH

#### **WIRELESS ACCESS**

Wireless Internet access is provided throughout our Santa Clara facility. The appropriate wireless network card is required. Any wireless connection is open to the Internet.

No protection against viruses, worms, intrusion, and other data vulnerabilities is provided by Extension. Protective software must be installed on the owner's laptop.

**LABS**—You must retain your enrollment receipt for access to our computer labs. All labs are subject to IT security updates.

#### 7 CONCURRENT ENROLLMENT

—Process and Policy See page 95.

8 INTERNATIONAL STUDENTS See page 88.

9 PAYMENT METHODS

#### **ENROLL**

NOW



**Online:** Visit our website at ucsc-extension.edu.

**Credit Card:** We accept the following major credit cards: Visa, MasterCard, American Express and Discover.

By Phone: Call (408) 861-3700.

Don't delay! ...... Early enrollment helps us meet mininum enrollment numbers so courses are less likely to be canceled due to low enrollments.

NOTE: Numbered footnotes refer back to topic numbers detailed in this section for General Information & Academic Policy.

Independance Day: Labor Day HOLIDAYS
July 4
September 5



#### 10 FINANCING YOUR EDUCATION—Policy

#### CORPORATE TUITION REIMBURSEMENT

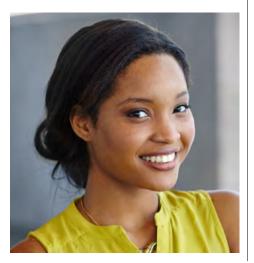
Many of UCSC Extension's courses qualify for corporate tuition reimbursement, especially those that pertain to your current job or a future position in your company. Be sure to check the tuition-reimbursement programs offered by your employer. Follow your company policy for receipt of grade requirements.

#### **GOVERNMENT TUITION ASSISTANCE**

Displaced or disadvantaged workers may be eligible for federal assistance through the Workforce Investment and Opportunity Act (WIOA) or the Employment Development Department (EDD). For students who qualify, funds may be applied toward the cost of Extension course fees, books, and materials. For additional information or to determine eligibility, contact either your local WIOA Board or Extension's coordinator at extensionwib@ucsc.edu. Funding eligibility must be determined prior to enrolling or participating in any course.

Contact your local **Workforce**Investment and Opportunity Board
or

Email Extension's coordinator: extensionwib@ucsc.edu



#### TAXPAYER RELIEF ACT OF 1997

The Taxpayer Relief Act of 1997 may help you put money back in your pocket. Contact a tax consultant or accountant or visit www.irs.gov/uac/Tax-Benefits-for-Education:-Information-Center to determine how the Act may apply to you. Other pertinent tax information for students is available at www.1098t.com. The University is required by federal law to request Social Security<sup>18‡</sup> numbers from all enrolled students who may qualify for tax credits.

#### **‡**UC Policy

NOTE: The University is required by federal law to request your SSN and report your SSN and other pertinent information to the Internal Revenue Service pursuant to the reporting requirements imposed by the Taxpayer Relief Act of 1997.

The University also will use the SSN you provide to verify your identity. This notification is provided to you as required by the Federal Privacy Act of 1974.

#### INCOME TAX DEDUCTIONS

You may be able to deduct expenses for education that is required by your employer, or by law or regulations, to keep your salary, status or job, or maintains or improves skills required in your present work. If your education qualifies, you may deduct the cost of items such as tuition, books, supplies, lab fees, travel, and transportation (Internal Revenue Service Publication 508, Rev. Nov. 86).

#### FINANCIAL ASSISTANCE

As a UCSC Extension student, you may be eligible for private financial assistance. UCSC Extension does not endorse or otherwise recommend specific lending sources. Information about private lenders is provided for information purposes only and can be found on our website at **ucsc-extension.edu/loans**.

Note: For lenders who require satisfactory academic progress to maintain loan status, satisfactory academic progress is defined as a minimum of 6 units per term for 2 terms per calendar year.

#### 11 COURSE MATERIALS

Courses are available 24 hours before start of class. For full instructions go to ucsc-extension.edu/course-materials.

#### COURSE READERS, TEXTBOOKS<sup>12</sup> AND OTHER INSTRUCTIONAL RESOURCES:

Students are responsible for obtaining the required instructional materials for each course they take.

Students should purchase, order, or access their materials in time to bring them to (or have access to them during) the first class meeting.

UCSC Extension courses use a variety of media for instructional purposes. These vary depending on the curriculum and instructor. Information on required and recommended textbooks<sup>12</sup> can be found in the section details of the course descriptions online at **ucsc-extension.edu**.

Instructors may specify any of the following:

- Electronic course materials from our online learning platform, UCSC Extension Online
- Textbooks<sup>12</sup> (required and recommended)

Look for this graphic reminder with instructions. .....

### ACCESS TO ONLINE COURSES AND MATERIALS



If you are enrolling for the first time in an Online course, or a classroom course with Online Materials, you will receive an account for UCSC Extension Online via email within 12 hours. If you have previously taken a course with online materials, you should use your existing account. Course sites will open one day prior to the official start date.

For more information, including help retrieving your account info, please visit ucsc-extension.edu/online-faqs.

For information on textbooks, see page 92 or visit **ucsc-extension.edu/bookstore.** 

#### 12 TEXTBOOKS

Most textbooks can be purchased through Extension's partnership with Amazon.com. Our website has a convenient search tool online at ucsc-extension.edu/bookstore.

TEXTBOOKS-AMAZON PARTNERSHIP INFORMATION ucsc-extension.edu/bookstore

#### 13 TRANSFER OF **UCSC EXTENSION CREDIT**

Some Extension courses may be applied toward degrees. We strongly encourage students to obtain confirmation of acceptance of Extension credit by the admissions office of the degree-granting university or college prior to enrolling.

#### **ACADEMIC CREDIT AND COURSE** NUMBERING

The following information can be located under each course title in the catalog: academic number (usually preceded by the letter X), academic discipline in which credit is granted, and the quarter-unit value of the course.

#### COURSE NUMBERS ARE CLASSIFIED AS FOLLOWS:

1–99:	Lower division
100-199:	Upper division
200-299:	Graduate division
**300–399:	Professional courses in Education

\*\*400-499: Professional courses in other departments

800 series or Noncredit or Continuing Education non-numbered Units issued. Academic credit and courses: letter grade not applicable.

#### ALL CREDIT IS OFFERED IN QUARTER-SYSTEM UNITS; SEMESTER EQUIVALENTS ARE:

Quarter: 1 1½ 2 3 4 5 Semester: 3/3 1 11/3 23/3 31/3

Some courses bear the designation "credit approval pending" after the X-number listed under the course title. When this catalog went to press, these courses were in the review process leading to approval for academic credit. The credit status of the course can be obtained by calling our staff at (408) 861-3700.

#### **CONTINUING EDUCATION UNITS (CEUS)**

Continuing Education Units were established by a national task force of educational associations and are intended for use where employers, relicensing agencies, or others require a specified number of hours of study, and noncredit study is acceptable for fulfillment of those requirements. One CEU is awarded for each 10 hours of contact participation. Because CEUs are related to contact time, grading is not appropriate.

#### 14 GRADING—Policy

#### **GRADE REPORTS**

Instructors assign grades on the basis of a student's performance on the activities outlined in their course syllabi. Grades are available online at ucsc-extension. edu within a month after a course ends. Those students who complete a certificate program with a grade-point average of 4.0 will earn a Certificate with Honors.

#### **OUR GPA CALCULATOR:**

www2.ucsc.edu/gpacalc

#### **GRADING OPTIONS**

When students enroll, letter grading is the default. The Credit or No Credit options are available only to students in good academic standing. Students may elect to take courses for a letter grade, Credit or No Credit.

The alternate Grade Request Form for Credit or No Credit grades must be emailed to extensiongrades@ucsc.edu before the last scheduled day of the course. A passing letter grade of "C-"or higher is required in order for a course to be applicable to a certificate.

#### ALTERNATE GRADE REQUEST FORM: www.ucsc-extension.edu/content/ student-services-forms

#### **INCOMPLETE GRADES**

Under certain circumstances, an "incomplete" ("I") may be authorized for students who are unable to complete a course within the prescribed time due to unforseen extenuating circumstances. Students must have completed a minimum of 70 percent of the course work and it must be of passing quality in order to qualify for an incomplete grade. To be considered for an incomplete, the student must send an alternate Grade Request Form by email to extensiongrades@ucsc.edu before the last scheduled day of the course.

If approved, the instructor and student will agree upon the terms of the incomplete, including the specific work required and the deadline for clearing the incomplete. Once the necessary work has been submitted, the "I" will be changed to the appropriate grade. Incomplete grades must be cleared by the agreed-upon deadline or the "I" will convert to an "F."

#### GRADE CHANGES

Per policy, changes to a final recorded course grade can be made only when there is evidence of a clerical or procedural error and never on the basis of re-examination or completion of additional work. For more information, including the formal grade appeals policy and process, visit ucsc-extension.edu/grievance-resolutions. Grade appeals must be filed within one month of the date grades are posted on your online student record.

#### TRANSCRIPT REQUEST INFORMATION<sup>†</sup>

To order an official transcript, use the Transcript Request form found at www.ucsc-extension.edu/ student-services/transcript-info.

Email, fax, or mail completed forms:

Records Office

UCSC Silicon Valley Extension

Email: extensiontranscripts@ucsc.edu Fax: (408) 342-0164

3175 Bowers Avenue Santa Clara, CA 95054

#### †Transcript processing

Please allow up to three weeks for standard processing. Rush transcript processing (two business days priority processing) may be obtained by adding the rush service fee to the request; however, no priority mail service is available. Please complete all information requested on the form. For assistance ordering transcripts or with your user name and password, call (408) 861-3700.

NOTE: Numbered footnotes refer back to topic numbers detailed in this section for General Information & Academic Policy.

<sup>\*\*</sup> All professional courses are deemed to be equivalent in academic rigor and faculty vetting as upper division courses on UCSC Main Campus.

#### 15 DROPS AND TRANSFERS

—Deadline Restrictions apply\*\*

Students may drop a course at any time before the final class meeting, or the end date of an online course, by completing the online form found at ucsc-extension.edu/drops. You will only be eligible for a refund if your drop request is received three business days<sup>††</sup> before the start date of a course.

A \$40 processing fee will be withheld for

#### A \$40 processing fee will be withheld for all drop requests.

Transferring to another section of the same course is considered a drop. The three business day deadline and same processing fee applies. Students who enroll in a course but do not attend must drop the course prior to the final class meeting to avoid having a negative academic impact on their official record. Instructors do not have the authority to drop a student.

††Business days are Monday through Friday, not including holidays.

#### INSTRUCTORS DO NOT HAVE THE AUTHORITY TO DROP A STUDENT.

#### 16 REFUND—Process and Policy

All refunds are put on account toward future enrollment, unless otherwise requested. As noted above, a \$40 processing fee will be withheld for all drop requests. Certificate and award application fees and special requests are non-refundable.

If the refund deadline for a course has passed, an **Exception Petition** may be submitted using the online form found at **ucsc-extension.edu/drops**. The petition must be supported by special circumstances such as a personal or family illness, injury, or hospitalization. Proper documentation of the special circumstance is required. UCSC Extension reserves the right to approve or deny any such request.

#### **COURSE CANCELLATIONS**

UCSC Extension reserves the right to discontinue, postpone or combine courses, and to change instructors without notice. If a course is cancelled, you may request an official transfer to another course or a full refund of the enrollment fee. UCSC Extension also reserves the right to discontinue entire programs or make significant changes in their structure without prior notice.

#### 17 GENERAL CODE OF CONDUCT

#### TAPE RECORDING, FILMING, AND VIDEOTAPING OF CLASSES

Regulations do not permit tape recording, filming, videotaping or any other recording of any Extension program without the express written permission of UCSC Extension.

#### STUDENT POLICY

ucsc-extension.edu/student-services

#### STUDENT CONDUCT

UCSC Extension, as a unit of the University of California, Santa Cruz, has high standards for academic integrity and student conduct. Extension students are expected to conform to a code of conduct that is appropriate and considerate of our highly diverse adult learning environment. Disruption of teaching, learning, research or administration through such activities as, but not limited to, disorderly conduct, physical or verbal abuse, threats of violence, academic dishonesty (including all forms of plagiarism and cheating), forgery, theft, unsanctioned use of alcohol, unlawful use of controlled substances, or any other action that might threaten UCSC Extension property or the health and safety of any person on UCSC Extension property or attending any UCSC Extension-sponsored event, will not be tolerated and is grounds for severe sanction including arrest and dismissal. See the Student Services page at ucsc-extension.edu/student-services for our full list of student policies.

#### **CRIME AWARENESS**

Federal law requires the reporting of crime statistics on college and university campuses. For help in obtaining crime incidence information relative to UCSC Extension's classroom facilities, call Kevin McGowan at (408) 861-3700. UCSC's annual security report includes statistics for the previous three years concerning reported crimes that occurred on campus, in certain off-campus buildings owned or controlled by UCSC, and on public property within, or immediately adjacent to and accessible from the campus. The report also includes institutional policies concerning campus security, such as policies concerning alcohol and drug use, crime prevention, the reporting of crimes, sexual assault, and other matters. You can obtain a copy of this report by contacting the UCSC Police Department or by accessing police.ucsc.edu/report/index.html.

#### SEXUAL HARASSMENT

The University cherishes the free and open exchange of ideas and enhancement of knowledge. Maintaining this freedom and openness requires objectivity, mutual trust and confidence; it requires the absence of coercion, intimidation or exploitation. The principal responsibility for maintaining these conditions must rest upon those members of the University community who exercise authority and leadership: faculty, managers and supervisors.

The University has therefore instituted a number of measures designed to protect its community from sexual and other forms of harassment. Information, advice, referrals and/or copies of UCSC's Sex Offense Policy and Procedures for Reports of Sexual Assault and Sexual Harassment are available to all students, faculty and staff by contacting

Tracey Tsugawa
Title IX Coordinator/Sexual Harassment Officer,
105 Kerr Hall, UC Santa Cruz Main Campus
ttsugawa@ucsc.edu

(831) 459-2462

The Title IX Coordinator is also available to investigate other violations of Title IX. Questions regarding discrimination may be directed to the Affirmative Action Office at **(831) 459-1590**.



#### **OUR FACILITY IS A TOBACCO-FREE ZONE**

Our Santa Clara facility is a tobacco and smoke-free zone in accordance with UC system-wide policy. This policy includes exterior areas of our property including walkways, patios, and parking areas, and applies to cigarettes, cigars, pipes and any other delivery method including smokeless tobacco and e-cigarettes. Please help us provide a safe and healthy environment for work and study by refraining from the use of these products on our property. We understand that cessation can be a challenge. To find strategies that can help, visit the American Lung Association's site at **FFSonline.org**.

#### 18 UC POLICY

#### ADMISSION—POLICY

Our programs are designed primarily for adult professional development. As required by federal and state law, the University of California does not discriminate on the basis of race, color, national origin, religion, sex, sexual orientation, disability or age in admission to or employment in the educational programs and activities which it operates. Inquiries concerning Titles VI and VII of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, Sections 503 and 504 of the Rehabilitation Act of 1973, the Age Discrimination in Employment Act of 1967, the Age Discrimination Act of 1975, Section 402 of the Vietnam Era Veterans Readjustment Act of 1974, the Americans with Disabilities Act of 1990, and Section 12940 of the California Government Code should be addressed to the

Office of the Dean, UCSC Extension, (408) 861-3700

or to the

Equal Employment/Affirmative Action Office, UCSC.

(831) 459-1590

The University is an affirmative action/equal opportunity employer.

Prior to enrolling in a class not specifically structured for children, a minor child must receive permission from the department sponsoring the course. A release form must be signed by the parent or guardian.

#### DISABLED STUDENT SERVICES: Please call (408) 861-3700 at least

Please call (408) 861-3700 at least two weeks prior to course or event.

#### ADA Compliance Officer and Registrar

can be reached at the above number or by emailing extensionregistrar@ucsc.edu

#### DISABLED STUDENT SERVICES—POLICY

In keeping with the Americans with Disabilities Act, UCSC Extension makes every effort to reasonably accommodate students with disability-related needs. If you require accommodation, contact our Student Services Office at least **two weeks** prior to the event or course. Our ADA Compliance Officer will work closely with you and the sponsoring department to ensure your access with reasonable accommodation. Please call **(408) 861-3700**.

Problems or grievances? Contact the number above or email **extensionregistrar@ucsc.edu**.

Follow these steps to get your issue resolved:

- 1. Verbal review/resolution (10-day response)
- 2. Written review/resolution if verbal fails (10-day response)
- 3. Contact the Dean if steps 1 and 2 are unsatisfactory or if your complaint is against the ADA Officer.

#### PRIVACY OF STUDENT RECORDS<sup>‡</sup>

The Registrar of UCSC Extension is responsible for maintaining Extension student records, and any questions about them should be addressed to the Registrar's Office at **extensionregistrar@ucsc.edu**.

The policies governing the disclosure of information from student records, specifically the Federal Family Educational Rights and Privacy Act of 1974 and the University of California Policies Applying to the Disclosure of Information from Student Records, are available at our office in Santa Clara. The full text of the federal law is available at the Student Affairs Office, located at 245 Hahn Student Services on the UCSC campus, (831) 459-4446.

**‡**UC Policy—See legal on page 99; **Item 10**: Taxpayer Relief Act; column 2; paragraph 2.

#### GRIEVANCES ucsc-extension.edu/ grievance-resolutions

#### **GRIEVANCE RESOLUTION PROCESS**

UCSC Extension has a policy and process in place to facilitate and expedite the resolution of grade disputes and student complaints. Please refer to ucsc-extension.edu/grievance-resolutions.



NOTE: Numbered footnotes refer back to topic numbers detailed in this section for General Information & Academic Policy.

## Concurrent Enrollment

## Open Campus

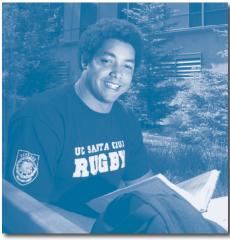


#### Take UCSC Campus Courses to Expand Your Horizons

The Concurrent Enrollment Program administered by UCSC Silicon Valley Extension allows you to enroll in courses offered on the UCSC campus without being formally admitted to a degree program. As a Concurrent Enrollment student, you may take up to 5 units, or more by petition.

Studying on campus will expose you to cuttingedge research, new developments in your field, and the latest teaching methods. The experience will help you focus and refine your advanced education goals. Class participation and assignments are the same as for regular students.

Most students are able to take the campus courses they want, but admission is on a space-available basis, and may require prerequisites as well as consent of the instructor. Some courses are also available at UCSC Silicon Valley in Santa Clara. The Concurrent Enrollment Program is available during the fall, winter, and spring quarters.



Photos by Jim MacKenzie

#### This Is an Ideal Option for Those Who:

- Need only 1 course to complete degree requirements at another institution
- Are thinking about returning to school, but not sure if they want to become a full-time student
- Are advanced high school students who want to take a college course
- Wish to gain up-to-date information in their professional fields
- Are lifelong learners

#### Pursue Graduate-Level Studies

Students may take graduate-level courses with the approval of the Graduate Division. An additional signature is required on the instructor approval form. Students may also take undergraduate courses as prerequisites to graduate programs or second baccalaureate programs. Be aware that there may be restrictions on the total number of courses that may be taken through Concurrent Enrollment for any of the above. Check with department advisors regarding these restrictions.

#### **Application and Enrollment Process**

- Obtain the application forms from UCSC Silicon Valley Extension. The forms are available on our website at ucsc-extension.edu/open-campus. Important forms include:
- The application form
- The instructor approval form
- Concurrent Enrollment fees and schedule
- 2. You must file the application each quarter and submit the application form by the deadline date. Concurrent Enrollment is on a term-by-term basis. Because you are accepted for only one term at a time, you are not quaranteed acceptance in any future term.
- 3. Your application will be reviewed and you will be notified by email only if there is a problem with your application.
- 4. Attend the first class meeting of the course(s) in which you wish to enroll. Take your instructor approval form with you to this meeting and let the instructor know that you are a Concurrent Enrollment student. The instructor may ask you to wait until he/she can determine if there will be space in the course after regular students have enrolled.
- 5. Return the signed and completed instructor approval form(s) to UCSC Silicon Valley Extension and pay the appropriate course fee(s) by the deadline date. Enrollment is complete upon payment of all appropriate fees and charges.
- If you have questions about any of the above steps, or have special circumstances not covered here, please feel free to contact Student Services at (408) 450-4920.

Participating in this educational program does not in itself provide preference in admission to the University of California. Students interested in applying to UC should refer to the UC Admissions website or the admissions office of the UC campus they wish to attend for details about the admissions process.

#### **Ordering Transcripts**

All grades and evaluations for course work completed through Concurrent Enrollment are kept at the Records Office of UCSC Silicon Valley Extension and **NOT** at the UCSC—Main Campus Records Office in Santa Cruz. You may request an official transcript of your Concurrent Enrollment course work at any time. If you indicate on your instructor approval form that this is your last class to graduate from UCSC, a copy of your transcript will automatically be sent to the UCSC—Main Campus Registrar's Office free of charge. Otherwise, the transcript must be requested.

To order an official transcript, please go to our website, ucsc-extension.edu/content/faq-transcripts, and use the online order form.

#### **Contact Student Services Today**

One of our associates can enroll you in a fall, winter, or spring quarter class, on a space-available basis with approval of the instructor.

Request an Application and Information Package Visit ucsc-extension.edu/open-campus.

Call (408) 450-4920 during Student Services' regular business hours: 8:30 am—4:30 pm, Monday—Friday.

Email us at opencampus@ucsc.edu.



Photo by Carolyn Lagattuta



## Instructor Biographies



#### A-B

ANDREA AMES, M.S., program chair, see page 42.

STEVE ARNOLD, M.B.A., is the owner of Custom Computer Services. He has taught at UCSC Extension since 1997. He has experience teaching courses in WAN, LAN, network administration, and online systems development.

AMER ATHER, B.S.E.E., has nearly 20 years of industry experience in operating system technologies and performance analysis of enterprise system solutions. He also has extensive experience in writing and debugging low-level kernel drivers in Solaris and Linux environments. He has published several technical articles in trade publications.

NATALIE BERNASCONI, Ed.D, has taught at the K-12 level for the past 20 years and undergraduate and master's level courses at UCSC since 2010. Her research focus is on English learners and access to technology as a social justice issue. She is co-curator of the Digital ID Project.

WENDEM BEYENE, Ph.D., is a senior principal engineer at Rambus Inc., responsible for the design and research of signal and power integrity of high-speed links. He formerly worked for IBM, Hewlett-Packard, and Agilent Technologies. He has published extensively in IEEE journals and conferences. He also co-authored two book chapters.

VAIDEHI BHANDARI, M.S., PMP®, has more than ten years experience managing projects for Google, Inc, and Cisco Inc. Ms. Bhandari specializes in technical and business operations, strategy and portfolio management, metrics and reporting, change management, establishing PMO best practices, and vendor management. Ms. Bhandari holds a master of science in telecommunications from the University of Maryland, College Park, and a bachelor of science in electronics and telecommunications from Prune University, Prune, India. She is a certified Project Management Professional (PMP®).

SANJAY BHATIA, B.S., PMP®, has over 23 years of experience managing and developing large scale enterprise software applications. He has held senior management positions at various companies in Silicon Valley, where he regularly delivered complex projects involving global teams in fast paced environments with aggressive schedules.

PRAVIN BHUSARI, M.S.E.E., has 20 years of technical experience in design, implementation, verification, sign-off, and methodology development for high performance, low power ASICs, and semicustom chips in Silicon Valley. He has taught logic synthesis courses for over seven years.

AUDREY BLUMENEAU, M.Ed., runs a private consulting firm, which develops, implements and maintains websites for a diverse clientele that includes large businesses, small start-ups, nonprofits and regional associations. She has taught HTML, Cascading Style Sheets, and Dreamweaver courses at UCSC Extension since 1999. She has worked as a technology instructor as part of a Gender Equity Grant from the National Science Foundation.

TIM BOMBOSCH, Ph.D. Stanford University, has more than ten years of experience managing documentation and training projects at various companies. His areas of expertise include biotech, medical devices, and consumer electronics. Dr. Bombosch is a frequent invited speaker and member of the Society for Technical Communications.

GUIDO BORDIGNON, Ph.D., M.S., is a professor in molecular biotechnology at the University of Venice, Italy. Dr. Bordignon was a visiting scholar at the Scripps Institute of Oceanography and Oregon Health Science University and completed three research expeditions to Antarctica with NOAA's Antarctic Marine Living Resources program. He has consulted for the United Nations Industrial Development Organization's International Centre for Science and High Technology.

BILL BROOKS, M.A., MPM, CIPM, is a practicing senior program manager with over 35 years of experience in high technology, and over 20 years teaching project management courses at UCSC Extension. He has also worked as an engineering manager, senior vice president and general manager, leading teams and developing project managers, in large corporations and small start-ups. He is an AAPM-Certified Master Project Manager (MPM) and an AAPM-Certified International Project Manager (CIPM).

MPM® is a registered mark of Project Management Institute, Inc.

#### C

JUANITA CAMPBELL-RODRIGUEZ, M.Ed., MA, M.A.T., program chair, see page 46.

MICHELLE CARPENTER, J.D., RAC, is a seasoned regulatory affairs professional with more than 20 years of global pharmaceutical industry experience. Ms. Carpenter has extensive experience leading negotiations with the FDA and has been involved in the approval and launch of 7 products. She is the president of RPSpharma, a consulting firm which provides regulatory and development consulting services to the pharmaceutical industry.

JOSE A. CARREON, M.S., has 30 years of experience in IT, with 15 years in information security marketing, bringing to market several award-winning security products. Mr. Carreon has held positions at Brocade, HP, SUN, and Apple. Currently he manages business development as chief evangelist for SecureCare International, a global consulting firm. He has taught information security courses since 2010.

CASEY CASE, Ph.D., is senior vice president of research and nonclinical development at Asterias Biotherapeutics, which is developing embryonic stem cell-based therapies for spinal cord injury and cancer. Dr. Case has served in leadership roles in research and development at SanBio Inc., Sangamo Biosciences, Tularik, and OSI Pharmaceuticals. Dr. Case has over 40 issued patents.

RAVISHANKAR CHITYALA, Ph.D., has extensive experience programming Python and Django. Dr. Chityala has been a researcher and consultant in scientific and medical image processing. He co-authored a book on image processing using Python. Dr. Chityala previously worked in the Minnesota Supercomputing Institute at the University of Minnesota.

DEBORAH CHOE, Ed.D., specializes in intercultural education and applied linguistics. In addition to teaching at UCSC Extension, she has taught language arts, linguistics and teacher education courses in colleges and universities in California. Her current research focuses on the language development of ESL students, their acculturation and their academic achievement in the United States.

STEVE CLARKE, M.B.A., has more than 25 years of experience in international businesses consulting for companies entering Asian markets. He is a successful entrepreneur and founder of China Silk Wines. Mr. Clarke has taught courses on strategy, ethics, marketing, economics, organizational behavior, operations management and brand development.

DIANNE V. CONRY, M.S., CPA, program chair, see page 24.

MICHELLE CORBIN, M.S., is a Web editor and information architect at IBM. She is an STC Fellow who has over 25 years as a technical communicator. She wrote the chapter "The Technical Editor in the Modern Organization" in *New Perspectives on Technical Editing*, edited by Avon J. Murphy.

ELIZABETH COREY, M.S., Ph.D., has over 15 years of experience in computer science and software development. She has worked on machine learning, algorithm development, parallelization, multicore and distributed computing, Hadoop, MapReduce, and financial analysis. Dr. Corey has applied data analysis in bioinformatics, sentiment analysis, and financial engineering. She has taught at the Baskin School of Engineering at UCSC and UCSC Extension for over five years.

JEFF COX, M.S., program chair, see page 29.

DEBORAH CRIM, M.S., BCET, trained as a special educator at Bank Street College in New York City. She has worked in diagnostic clinics, public and private schools, and private practice. She teaches structured, multi-sensory phonics, remedial mathematics, and written language, as well as study strategies. She belongs to the International Dyslexia Association, Association of Educational Therapists, and Learning Disabilities Association.

#### D

CHARLES DANCAK, M.S.E.E., is a consultant with 25 years of experience in the semiconductor and EDA industries. He has taught RTL design and debug using Verilog, SystemVerilog, and VHDL as well as DFT/ATPG. His expertise is drawn from years of experience at Synopsys and Intel. He has taught for UCSC Extension since 2002.

MARILYN DAVIS, Ph.D., is a well-regarded Python trainer for the industry and has taught Python at UCSC Extension since 1997. She has contributed software for computer-aided instruction, astronomy, statistics, environmental research, operations research, e-mail service, and electronic democracy.

MICHAELA DE SAPIO-YAZAR, M.S. in education, E/T, has run her own educational therapy and tutoring practice since 1998. Ms. De Sapio-Yazar has been a certified educational therapist since 2011 and also works part-time at Myndflex, a nonprofit educational program for children. She works with children who have a range of learning differences and disabilities.

MICHAEL W. DONG, Ph.D., is a principal consultant at MWD Consulting. He was formerly senior scientist at Genentech and research fellow at Purdue Pharma. He holds a Ph.D. in analytical chemistry from City University of New York, and has over 20 years of experience in HPLC and pharmaceutical development. He has 100+ publications and authored three books, including Modern HPLC for Practicing Scientists.

ERIC DORF, B.F.A., D.M.B.A., is principal user experience and interface designer and design manager at Startup Monthly. He has an M.B.A. in design strategy and has worked in the design of mobile, cloud, desktop and Web service products for a wide range of clients, including Autodesk, eBay, Intuit, Oracle, The Food Network and Sliced Bread Design.

#### E-F

RAMIN ELAHI, M.S.E.E., is an engineering training solution architect with NetApp Inc., where he's responsible for customer-centric Cluster ONTAP products. He has taught for UCSC Extension since 2008. His areas of expertise include data center storage and virtualization and cloud computing services with an emphasis on high availability and mission critical enterprise SAN and IP products.

VICTOR EYDUS, Ph.D., has over 16 years of experience designing, developing, and managing complex software applications with an emphasis on agile project management, business intelligence, data warehouses, object-oriented analysis and database design, Web development, and systems integration. His software applications have been used in multiple industries. Dr. Eydus has ten publications, including the book Database Design.

TERRI FITZMAURICE, B.A., has worked in the high tech industry for over 30 years. She is currently a webmaster at the Central California Alliance for Health. Ms. Fitzmaurice has previously worked for BD Biosciences, Stanford University, IBM, Apple Computer, and other companies. Her roles have included Web and graphic design, illustration, writing and editing, and project management.

JUAN JOSÉ FUNG, Ph.D. in molecular and cellular physiology from Stanford University, has over 10 years of extensive academic and biotech experience investigating membrane proteins. He did postdoctoral work in structural biology at Stanford and has worked as a researcher in the small-molecule, biotherapeutic and CRO industry sectors, focusing on cell physiology and drug discovery.

#### G

GILBERT GARCIA, B.S., M.B.A., is a business and technology consultant with over 30 years of experience in IT, digital marketing, software development, data science, system architecture, mobile phone app development, networking; and IoT and embedded systems design. He has worked for NASA, eBay, and many other Silicon Valley companies. He also has experience teaching programming, networking, system administration, database design, web site design and architecture, data science, and embedded systems.

OLIVER GILDERSLEEVE, M.S.E.E., PMP® is a lead planner for Dynamics Research Corp, working remotely on a contract with the Department of Veterans Affairs. He has 12 years of experience in project management. He was vice president of Project Governance for EPM Solutions and taught Microsoft Project and Project Server for Project Managers at companies across the U.S. He is also co-founder and past president of Microsoft Project Users Group's Silicon Valley chapter.

JESSE GILLISPIE, Ph.D., program chair, see page 55.

GARY GIUST, Ph.D., has worked at AMCC (Applied Micro), PhaseLink and Cypress Semiconductor, defining high-performance timing solutions, and earlier as an analog designer for PLLs and SERDES chips.

RADHIKA S. GROVER, Ph.D., is the CEO of SPEL Technologies, a startup in educational products. She is also an adjunct lecturer in computer and electrical engineering at Santa Clara University. She has over 10 years of experience in research and teaching. Dr. Grover is the author of the book *Programming with Java: A Multimedia Approach*.

KIRAN GULATI, M.B.A., RAB-LA, program chair, see page 18.

PRAMOD GUPTA, Ph.D., has over 15 years of experience in industrial and academic settings. His areas of expertise include controls, simulation and modeling, estimation, robotics, machine learning, data modeling, data analysis, predictive analytics and performance analysis of dynamical systems. Dr. Gupta has worked on analytics in the financial, transportation, power, automotive, and server industries. He has over 40 publications.

#### H-J

TERESA HARDY, B.S., M.A., has over 20 years of experience in marketing and engineering, and has worked as a Web and multimedia developer since 2005. She has worked extensively in Web programming and site management. Ms. Hardy develops websites for multiple small business clients and teaches Web designs at local universities in the San Francisco Bay Area.

SARAH HARMON, Ph.D., is an adjunct professor of Spanish. She is also a member of the Sigma Xi Research Society and of the American Council for the Teaching of Foreign Languages. She has taught Spanish and lower-division linguistics courses at the collegiate level since 1999, both at major universities and community colleges.

CRAIG HARRISON, B.A., is a professional speaker, consultant, and founder of Expressions of Excellence! TM. He has conducted training for Fortune 500 companies since 1997 and has taught for UCSC Extension since 2001. Mr. Harrison is a past president of the National Speakers Association, Northern California chapter, and has served on the boards of the American Society for Training and Development and the International Customer Service Association.

DANIEL HECKMYER, M.A., has taught English as a Second Language (ESL) for more than 15 years. He is active in many ESL professional development organizations, including TESOL, CATESOL, and NAFSA, and is a founding member of both the San Diego, CA and Chautauqua County, NY TESOL chapters. He has served in both teaching and administrative roles in Taiwan, Oregon, Illinois, New York, and Southern California, and is currently program manager of the EC English language center at UC Santa Cruz Silicon Valley Campus.

#### INSTRUCTOR BIOGRAPHIES

ERIC C. HEILMANN, B.S., M.S., M.B.A., has over 20 years of experience in the aerospace, embedded systems and semiconductor industries. His major responsibilities include project management, new product introduction, product requirements definition, and customer engagement. Mr. Heilmann is a Certified Scrum Master and holds a PMP® certification from the Project Management Institute®.

BESS HO, M.S., is a founding partner at Archimedes Labs, a startup incubator. She started as a data science engineer before transitioning into user interface engineering. Ms. Ho has been involved in the development of iOS applications since Apple released the iOS SDK in 2008. She competed among a few hundred developers at iOS Dev Camp and her application designs won multiple times. She co-authored the *Sams Teach Yourself Twitter API in 24 Hours* book.

HOLLY CORNELISON HOPLA, M.Ed., program chair, see page 53.

MICHAEL HUSTON, B.S., M.B.A., program chair, see page 16.

LYNN HUGHES, M.A., SPHR, CCP, has more than 20 years of experience in HR management in the high-technology and life sciences industries.

SAM HUYNH, Ph.D., is a principal member of technical staff and a senior manager at AMD. He has over 18 years of experience in the field of VLSI design including memory, IO, physical design implementation and full chip integration. He has three patents and 10 publications.

JAY JAMALI, B.S., CSP, CHMM, CHCM, is the director of Enviro Safetech, Inc., an environmental, health and safety consulting company. He has been providing EHS services in the Bay Area for 20 years and has been an instructor at UCSC Extension since 1990. Mr. Jamali has worked at Superfund sites and has responded to more than 200 hazardous-materials emergencies.

ALKA JARVIS, M.B.A., is a Distinguished Quality Engineer at Cisco Systems. She has authored five books and is a RAB-QSA certified auditor. Ms. Jarvis is the chair of the U.S. Technical Advisory Group, which develops ISO 9001 standards. She has taught at local universities for more than 20 years and is a recipient of Silicon Valley's Corporate Woman of the Year Award.

JESSE JENKINS, B.S.E.E., M.S.E.E., Ph.D., was a product planning manager at Xilinx, Inc. He has 20 years of PLD experience, holds multiple patents and has written a beginning text on PLDs and FPGAs. He has taught for UCSC Extension since 1997.

#### K

RAVI KALLURI, M.S.E.E. from Stanford, M.B.A., PMP® and Certified Scrum Master, has more than 15 years of experience leading complex software development projects. He has four years of experience teaching project management.

GARY KATZ, M.S., is CEO of a marketing operations and a marketing communications company. He has more than 25 years experience as a marketing strategist, program director, project manager and communications professional. He is the four-term chair of the Henry Stewart Conference's marketing operations track, sits on the BMA's national board, and is VP of AMA's.

DONALD KEIDEL, Ph.D., has six years of software development and nine years of research experience in bioinformatics. He is proficient in Python, PHP, HTML, and shell scripting, and has worked at bioinformatics and technology companies. Dr. Keidel has development experience with object-oriented technology, search engines and databases. A former postdoctoral fellow at the Scripps Research Institute, he has three years of teaching experience at colleges and universities.

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#### L

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#### M

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#### N-C

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#### K

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#### 5

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#### Т

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#### U-V

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#### W-Z

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