UCI Extension

Predictive Analytics Certificate Program

Accelerate Your Career

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Offered in partnership with:

Predictive™
Analytics
WORLD

University of California, Irvine

Improve Your Career Options with a Professional Certificate

University of California, Irvine Extension's professional certificate and specialized studies programs help you increase or enhance your current skills or prepare for a new career. Courses are highly practical and instructors are qualified leaders in their field. Convenient online courses make it easy to learn on your own time, in your own way. A certificate bearing the UC seal signifies a well-known, uncompromising standard of excellence.

Predictive Analytics Certificate Program

Highly successful businesses know that the rules have changed. No longer can they rely solely on their product or service to grow; they must leverage their data (financial, customer support, web interactions, etc.) to better understand their customers and learn from the collective experiences of their organizations to remain competitive. Predictive analytics provides clear, actionable initiatives based on existing company data and is a natural extension of related corporate initiatives in areas such as web analytics, business analysis, and data mining. As Eric Siegel, Ph.D., chairman of the Predictive Analytics World often quotes, "Business is becoming a numbers game and predictive analytics is the way to play it."

Intriguing applications of predictive analytics that yield measurable and often dramatic business results are all around us. Ever wonder how Facebook or Amazon come up with advertisements and suggestions that often have an amazing relationship to your needs? Or how the credit reporting agencies determine your credit score based on their estimation of your likelihood to pay your bills in the future? This is all done with predictive analytics models – using a variety of historical data to predict future actions.

UC Irvine Extension's Predictive Analytics certificate is a comprehensive online program designed for working adults to develop the skills they need to succeed in this exciting, high growth field. Learn how to better understand customer needs and business processes in ways that drive business results. Optimize your marketing campaigns and website behavior to increase customer responses and conversions.

The curriculum focuses on developing a comprehensive understanding of the creation and utilization of predictive analytics models by defining business goals, preparing data, developing and verifying a model, then deploying and refining it. Elective courses include intriguing and related new techniques such as text and sentiment analytics, big data, ensemble methods, and risk analysis.

Who Should Enroll

This program is intended for professionals who are using or wish to use predictive analytics to optimize business performance at a variety of levels in a wide range of industries such as commercial products, banking, financial services, digital marketing, e-commerce, entertainment, government, healthcare, high technology, insurance, and non-profits. The predictive analytics program is often the logical next step for professional growth for those in business analysis, web analytics, marketing, business intelligence, data warehousing, and data mining. The program will also benefit students who wish to distinguish themselves across a broad range of employment and technical disciplines.

Certificate Eligibility and Requirements

The Predictive Analytics Certificate is awarded upon the minimum completion of five (5) required courses and (3) elective courses totaling eight (8) courses for a minimum of sixteen (16) units or 160 hours of instruction with a grade of 'C' or higher in each course.

Students interested in pursuing both the Predictive Analytics and Data Science programs may overlap two courses to satisfy certificate requirements into both programs.

To become an official candidate in the program, students pursuing the certificate must submit a Declaration of Candidacy. To receive the certificate after completing all program requirements, students must submit a Request for Certificate. All requirements must be completed within 5 years after the student enrolls in his/her first course. Students not pursuing the certificate program are welcome to take as many individual courses as they wish.

Corporate Training

Extension's Corporate Training specialists can deliver this program or a customized one that fits your company's specific needs. Visit extension.uci.edu/corporate or call (949) 824-1847 for information.

Program Benefits

- Understand the art and science of predictive analytics to define clear actions that result in improved decisions and business results
- Develop actionable plans from existing corporate data and initiatives in business analysis, business intelligence, web intelligence, data mining, and digital analytics to increase sales, reduce marketing costs, and improve customer retention
- Select, prepare, construct, integrate, structure, and format data to be most effective for business goals
- Learn how to suppress customers least likely to respond to direct marketing campaigns, dramatically reducing costs and improving ROI
- Define appropriate business goals for a predictive analytics implementation in the "language" of a specific industry or business
- Optimize product development, manufacturing, testing, and maintenance
- Understand the use and assist in the selection of industry standard analytics tools
- Integrate powerful and traditionally untapped sources of information including social data, unstructured text, and big data sets
- Recognize how analysts can be misled by data due to over searching, over fitting, and leaking of the input variables
- Manage fraud by scoring and ranking data collected from interaction with customers
- Refine and improve the efficiency of existing online analytical processing (OLAP)

Program Fees

The total cost of the program varies depending on the electives chosen. Actual fees may differ from the estimate below. Fees are subject to change without prior notice.

Course Fees	$5,670
Candidacy Fee	$125
Textbooks	$450
Total Estimated Cost	**$6,245**

Curriculum

Required Courses (10 units)

Introduction to Predictive Analytics
I&C SCI X425.61 (2.0 units)
Gain a fundamental understanding of the art and science of predictive analytics as it relates to improving business performance. This hands-on course will cover the key concepts necessary to extract stored data elements, understand what they mean from a business point of view, transform their formats, and derive new relationships among them to produce a dataset suitable for analytical modeling. At the end of the course, participants will be able to use these skills to produce a fully processed data set compatible for building powerful predictive models that can be deployed to increase profitability.

Defining Business Goals for Predictive Analytics
I&C SCI X425.62 (2.0 units)
Predictive analytics can be used to seek out increasingly small margins and understand a company's customers, products, channels, partners, and more. However, predictive analytics is only part of the solution. These analytic insights must be put to work and used properly to aid in making better business decisions. This course covers the framework to identify which decisions can be improved. Learn how to build business support for predictive analytic efforts, scope them appropriately, and develop a plan for successful implementation. The curriculum also includes an introduction to decision management, a proven approach to linking predictive analytics to a business and its goals.

Effective Data Preparation
I&C SCI X425.63 (2.0 units)
Broadly speaking, data preparation for data mining consists of three (3) elements: 1. Data Mining Process delineation (understanding the overall process) 2. Data Understanding (data cannot be properly prepared without first understanding it) 3. Data Pre-processing (transforming data into a form compatible with data mining). This intensive hands-on course gives students the skills necessary to extract stored data elements, understand what they mean in the company, transform their formats, and derive new relationships among them to produce a dataset suitable for analytical modeling. Students will learn how to produce a fully processed data set compatible for building powerful predictive models that can be deployed to increase business profitability.

Algorithms, Modeling Methods, Verification and Validation
I&C SCI X425.64 (2.0 units)
Learn how to use the basics of predictive analytics and modeling data to determine which algorithms to use. Review the similarities/differences and which options affect models the most. Discover how to verify and validate your model. Topics include algorithms for supervised learning, decision trees, linear and logistic regression, neural networks, k-nearest neighbor, support vector machines, and model ensembles. Gain a deeper understanding of how algorithms work qualitatively by reviewing best practices and the influence of various options on predictive models.

Deploying and Refining Predictive Models
I&C SCI X425.65 (2.0 units)
Gain a fundamental understanding of the art and science of predictive analytics as it relates to improving business performance. This introductory course will cover predictive models, scoring, training data, multiple predictor variables, and decision trees. Develop skills to learn from the training data and create actionable initiatives based on the results. Key predictive modeling techniques, methods, management, and deployment of predictive models will be discussed.

Elective Courses (Minimum 6 units)

Business Intelligence/Data Warehouse
I&C SCI X425.22 (3.0 units)
Learn how to make better business decisions, use fewer resources, and improve your company's bottom line by developing and using a data warehouse. This course provides an overview of business intelligence and data warehousing and looks at the major facets of developing and using a data warehouse to make effective business decisions. Work on a single project to develop a project plan and business case for a data warehouse. Develop a dimensional model, staging process, and a data access process. Discover careers working with business intelligence and data warehousing as well as the educational requirements for this field.

Text Analytics and Text Mining
I&C SCI X425.68 (2.5 units)
Stored, unstructured data, most often in text format, represents a vast, often untapped and extremely valuable source of business information. Learn practical techniques for text extraction and text mining in a data mining context. Other topics include document clustering and classification, information retrieval, and the enhancement of structured data. An emphasis will be placed on the practical use of text mining in a business context. In addition, basic concepts of textual information such as tokenization, part-of-speech tagging, and disambiguation will be covered.

For more information:
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Big Data
I&C SCI X425.70 (2.0 units)

"Big Data" is a reality in many industries. Very large databases of more than 100 petabytes are becoming more common with data storage and reporting technology becoming faster and easier. Successful users of big data, like Wal*Mart, Amazon, Google and others harness data in ways simply impossible 15 years ago. This course will begin with a review of some case histories of big data use. Basic elements of successful big data implementation will be covered as well as a review of commercially available tools and technology. A focus will be placed on value opportunities in online marketing, search optimization and site performance modeling. Other topics covered in the course will include database architecture as related to knowledge discovery and evaluation of the relative merits of normalized relational databases, report-oriented dimensional designs, and unstructured SQL-free systems. All students across the business, technical, and analytic spectrum are welcome.

Risk Analytics
I&C SCI X425.72 (2.0 units)

Discover key applications of predictive analytics in risk management. Risk can come in many forms such as losing a customer, database opt-outs, insurance policy claims, fraud, illness, or failure to pay a loan. For industries such as healthcare, credit/finance, consumer products & services, engineering, product development, and insurance, the identification and quantification of risk is critical to make informed business decisions and optimize business processes. Even business sectors that traditionally work with actuarial/risk management data such as insurance and healthcare can extend and benefit from the application of predictive analytics to their existing models. Learn how to use predictive analytics techniques to focus on both the macro or "headline" level risks as well as the more difficult to discern micro risks. Course topics include: risk baseline definition, set analysis options, evaluation, interpretation and reporting measurement decision risks, developing minimum-cost risk management programs, policies, and strategies.

R Programming
I&C SCI X425.20 (2.0 units)

R is a scripting language for statistical data manipulation and analysis. R is an open source package available under GNU license at no cost. R competes with SPSS, another very well-known statistical package used heavily in many industries. Statistics is used in every part of business data processing and prediction. Data captured by web analytics services need statistics. Statistics is also the foundation of predictive analytics. R business applications include correlation, regression, hypothesis testing, and all inference testing. This course will focus on R programming which is used for solving business problems related to basic math and statistics. First, all relevant math concepts will be reviewed. This will include functions, regression, descriptive and inferential statistics, and matrix operations. All these basic math problems will be solved using R. The programmatic interface and graphic capabilities of R will also be explored. In the end, several real-world business problems will be solved using R.

Hadoop: In Theory and Practice
I&C SCI X425.18 (3.0 units)

Today, organizations in every industry are being showered with imposing quantities of new information. Along with traditional sources, many more data channels and categories now exist. Collectively, these vastly larger information volumes and new assets are known as big data. Enterprises are using technologies such as MapReduce and Hadoop to extract value from big data. This course provides an in-depth overview of Hadoop and MapReduce, the cornerstones of big data processing. To crystalize the concepts behind Hadoop and MapReduce, you will work through a series of short/ focused exercises; you will configure and install a Hadoop cluster, write basic MapReduce programs, gain familiarity with advanced MapReduce programming practices, and utilize interfaces such as Pig and Hive to interact with Hadoop. You will also learn about real-world situations were MapReduce techniques can be used.

Predictive Analytics and Decisioning Systems for Medicine
I&C SCI X425.74 (1.5 units)

Learn how to apply fundamental Predictive Analytics concepts to medicine and healthcare. With the increasing usage of electronic medical records, the healthcare industry can utilize patient data to better analyze and improve quality of care in healthcare and medicine. Concepts covered in this course include an introduction to nursing and medical informatics, health plan care management, genetics, government laws and regulations, and critical healthcare issues for predictive analytics.

Advisory Committee

Dean Abbott, President, Abbott Analytics

John Elder, Ph.D., Chief Scientist, Elder Research

Ian Harris, Ph.D., Associate Professor, Donald Bren School of Information and Computer Sciences, University of California, Irvine

Gary Miner, Ph.D., Senior Consultant/Statistician, Statsoft

Bob Nisbet, Ph.D., Consulting Data Scientist

Ash Pahwa, Ph.D., CEO, A+ Web Services

Eric Siegel, Ph.D., Chair, Predictive Analytics World

Padhraic Smyth, Ph.D., Professor, Department of Computer Science, Donald Bren School of Information and Computer Sciences, University of California, Irvine

Jim Sterne, President, Target Marketing, Chairman, Digital Analytics Association, Founder, eMetrics Marketing Optimization Summit

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