

MGT 280. Business Issues in Electronic Commerce (4)

Seminar, 3 hours; outside project, 3 hours. Prerequisite(s): MGT 205 or consent of instructor. Provides an understanding of the various business strategies, management issues, and pertinent technologies related to electronic commerce. Explores several of the problems surrounding electronic commerce including security issues, privacy, encryption, safeguarding of intellectual property rights, acceptable use policies, and legal issues.

MGT 281. Systems Analysis and Design (4)

Seminar, 3 hours; outside project, 3 hours. Prerequisite(s): MGT 205, MGT 230; or consent of instructor. Provides an understanding of the systems development life cycle with emphasis on the analysis and design phases. Familiarizes students with the tools and processes used by system developers to analyze, design, and construct computer-based systems. Provides experience in analyzing and designing a computer-based system.

MGT 282. Business Data Communications (4)

Seminar, 3 hours; outside project, 3 hours. Prerequisite(s): MGT 205. Provides insight into the role of telecommunications in business, with an emphasis on information management. Specific topics include data communications (hardware components, interfaces, and link protocols), architecture and technology (protocols, local area networks, and emerging digital services), and network management (control and security).

MGT 284. Issues in Asian and American Business Interactions (4)

Seminar, 3 hours; individual study, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Studies American and Asian business interactions, including international trade, outsourcing, joint-venture agreements, foreign direct investments, and multinational organizations. Develops an understanding of the opportunities for business and trade between American and Asian organizations and the skills required to manage resources and successfully implement multinational business strategies.

MGT 285 (E-Z). Special Topics in Management (4)

seminar, 3 hours per week or 30 hours per quarter; assignment of the remaining hours varies from segment to segment. Prerequisite(s): graduate standing; consent of instructor. Additional prerequisites are required for some segments of this course; see the School. Covers topics not contained in a regular course. Topics are announced at the time of offering.

MGT 290. Directed Studies (1-6)

Prerequisite(s): consent of instructor. Directed studies and research in selected problems or theories of management for advanced graduate students to pursue special areas of interest. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

MGT 297. Directed Research (1-6)

Prerequisite(s): consent of instructor. Directed research in selected problems of management for graduate students with special research interests. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

MGT 298-I. Fieldwork in Management (1-4)

Field, 3-12 hours; consultation, 1 hour. Prerequisite(s): consent of instructor. Supervised field experience culminating in a final report or other academic component. May be repeated for up to 8 units of credit toward the degree.

MGT 299. Research for Thesis or Dissertation (1-12)

Prerequisite(s): consent of instructor. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

Professional Courses

MGT 302. Apprentice Teaching (1-4) Seminar, 1-4 hours. Prerequisite(s): limited to departmental teaching assistants; graduate standing. Supervised individual instruction in teaching including monitoring of teaching assistant's activities and regular consultation with assistant concerning teaching responsibilities. Graded Satisfactory (S) or No Credit (NC). May be repeated; not for degree credit.

MGT 403. Review of Quantitative Methods for Management (4) Lecture, 3 hours; laboratory, 1 hour; individual study, 2 hours. Prerequisite(s): graduate standing. Reviews quantitative concepts and techniques related to the various functional areas of management. Topics include properties of functions, systems of equations and matrices (linear algebra), differentiation and integration (calculus), and basic probability concepts. Not for degree credit. Satisfactory (S) or No Credit (NC) grading is not available.

MGT 404. Communications, Leadership, Teams, and Ethics (2) Lecture, 7 hours per quarter; workshop, 28 hours per quarter. Prerequisite(s): graduate standing. Uses case discussions, presentations, and theoretically informed readings to develop communication, presentation, and leadership skills; examine the principles of effective teamwork; and introduce representative ethical issues confronting managers. Not for degree credit.

Marxist Studies Minor

College of Humanities, Arts, and Social Sciences

Joseph Childers, Ph.D., Chair
Thomas Patterson, Ph.D., Acting Chair
HMSS 2109
(951) 827-1829;
www.marxiststudies.ucr.edu

Committee in Charge

Edna Bonadich, Ph.D. (Sociology/Ethnic Studies, Emeritus)
Christopher Chase-Dunn, Ph.D. (Sociology)
Joseph Childers, Ph.D. (English)
Jennifer Doyle, Ph.D. (English)
Carole Fabricant, Ph.D. (English)
Christine Gailey, Ph.D. (Women's Studies)
Michael Kearney, Ph.D. (Anthropology)
Victor Lippit, Ph.D. (Economics)
Brian Lloyd, Ph.D. (History)
Bernd Magnus, Ph.D. (Philosophy, Emeritus)
B. Toby Miller, Ph.D. (Media and Cultural Studies)
Ken Rogers, Ph.D. (Art History)
Georgia Warnke, Ph.D. (Philosophy)
Stephen E. Cullenberg, Ph.D.
Dean, College of Humanities, Arts, and Social Sciences, ex officio

The Marxist Studies minor integrates courses from various disciplines in order to examine the theory and main applications of Marxism in the social sciences and humanities disciplines.

Requirements for the minor (24 units)

- Theory, method, and history of thought requirement
 - ECON 115
 - PHIL 153

- Four courses from the following dealing with applications of Marxist studies in various fields:

- ANTH 131
- CPLT 180X
- ECON 175
- POSC 160
- WRLT 170/ETST 170

See Minors under the College of Humanities, Arts, and Social Sciences in the Colleges and Programs section of this catalog for additional information on minors.

Materials Science and Engineering

Subject abbreviation: MSE
The Marlan and Rosemary Bourns
College of Engineering

Alexander A. Balandin, Ph.D., Chair
Advising Office, A159C Bourns Hall;
(951) 827-3647 (ENGR)
www.engr.ucr.edu/mse

Program Committee

Alexander A. Balandin, Ph.D., (Electrical Engineering)
Sakhrat Khizroev, Ph.D., (Electrical Engineering)
Mart Molle, Ph.D. (Computer Science and Engineering)
Nosang Myung, Ph.D. (Chemical and Environmental Engineering)
Cengiz Ozkan, Ph.D. (Mechanical Engineering)
Valentine Vullev, Ph.D. (Bioengineering)

Major

The B.S. degree in Materials Science and Engineering is offered jointly by the five participating departments of The Marlan and Rosemary Bourns College of Engineering. The program aims to produce students who are effective team players in materials engineering or related engineering, science or managerial positions, who use and improve on their skills in the job; who can enter into graduate or professional degree programs; and who are responsible engineers, professionals or scientists demonstrating ethical and professional responsibility and continuing to learn through a variety of educational experiences.

The program aims to produce graduates who:

- can apply knowledge of the scientific and engineering principles underlying major elements of materials engineering -- the structure, properties, processing, and performance of materials
- can design and conduct experiments relevant to materials science and engineering as well as analyze and interpret experimental data
- can identify, formulate, and solve materials selection and design problems

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- can work in multidisciplinary teams
- can appreciate professional and ethical responsibility and the importance of continued learning after graduation
- can communicate effectively
- have a basic understanding of the impact of engineering on society, including the economy and environment
- have an elementary understanding of contemporary issues in materials science and engineering

University Requirements

See Undergraduate Studies section.

College Requirements

See The Marlan and Rosemary Bourns College of Engineering, Colleges and Programs section.

The Materials Science and Engineering major uses the following major requirements to satisfy the college's Natural Sciences and Mathematics breadth requirement.

1. One course in the biological sciences chosen from an approved list
2. CHEM 001A, CHEM 001LA
3. MATH 008B or MATH 009A
4. PHYS 040A, PHYS 040B

Major Requirements

1. Lower-division requirements (68 units)
 - a) CHEM 001A, CHEM 011A, CHEM 001B, CHEM 011B, CHEM 001C, CHEM 011C
 - b) CS 030
 - c) EE 001A, EE 011A
 - e) MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B, MATH 046
 - d) ME 010
 - f) MSE 001
 - g) PHYS 040A, PHYS 040B, PHYS 040C
2. Upper-division requirements (52 units)
 - a) CHEM 112A
 - b) CEE 135
 - c) CHE 100
 - d) EE 138
 - e) ENGR 180
 - f) ME 110, ME 114, ME 156
 - g) MSE 160, MSE 161, MSE 175A, MSE 175B
 - h) STAT 155
 - i) Technical Electives (20 units): chosen from BIEN 140A/CEE 140A, BIEN 140B/CEE 140B, CEE 147, EE 133, EE 136, EE 137, EE 139, ME 113, ME 116, ME 138, ME 153, ME 180

Visit the Student Affairs Office in the College of Engineering or student.engr.ucr.edu for a sample program.

Lower-Division Course

MSE 001. Fundamentals of Materials Science and Engineering (2) Lecture, 1 hour; discussion, 1 hour; laboratory, 1 hour. An introduction of properties and applications of different types of materials essential for various areas of engineering. Explores the relationship between structure and properties as well as processing of the materials. Illustrates a wide range of properties required for different types of applications. Graded Satisfactory (S) or No Credit (NC).

Upper-Division Courses

MSE 160. Nanostructure Characterization Laboratory (4) Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): ME 114. Covers structure of materials at the nanoscale, including semiconductors, ceramics, metals, and carbon nanotubes. Explores relationships among morphology, properties, and processing. Addresses primary methods of characterization, including scanning electron microscopy, scanning probe microscopy, X-ray diffraction, and transmission electron microscopy. Also covers elementary discussions of X-ray, vibrational, and electron waves in solids and introductory diffraction theory.

MSE 161. Analytical Materials Characterization (4) Lecture, 3 hours; laboratory, 3 hours. Prerequisite(s): MSE 160. Analysis of the surfaces of materials via ion, electron, and photon spectroscopies. Includes Rutherford back scattering; secondary ion mass spectroscopy; electron energy loss spectroscopy; Auger electron spectroscopy; X-ray photoelectron spectroscopy; photoluminescence; extended X-ray absorption fine structure; Fourier transform infrared spectroscopy; and Raman spectroscopy. Also covers sputtering, high-vacuum generation, and focused ion beam milling.

MSE 175A. Senior Design (4) Lecture, 2 hours; discussion, 1 hour; practicum, 3 hours. Prerequisite(s): CHE 116 or ME 116A; EE 139; senior standing in Materials Science and Engineering. Covers preparation of formal engineering reports and statistical analysis on a series of problems illustrating methodology from various branches of applied materials science and engineering. Addresses the entire design process: design problem definition; generation of a design specification; documentation; design review process; prototype fabrication; testing and calibration; cost estimation; and federal guidelines. Requires a term project and oral presentation. Graded In-Progress (IP) until MSE 175A and MSE 175B are completed, at which time a final, letter grades is assigned.

MSE 175B. Senior Design (4) Lecture, 1 hour; discussion, 1 hour; practicum, 6 hours. Prerequisite(s): MSE 175A; senior standing in Materials Science and Engineering. Covers preparation of formal engineering reports and statistical analysis on a series of problems illustrating methodology from various branches of applied materials science and engineering. Addresses the entire design process: design problem definition; generation of a design specification; documentation; design review process; prototype fabrication; testing and calibration; cost estimation; and federal guidelines. Requires a term project and oral presentation. Satisfactory (S) or No Credit (NC) grading is not available.

Mathematics

Subject abbreviation: MATH
College of Natural and Agricultural Sciences

Vijayanthi Chari, Ph.D., Chair
Department Office, 202 Surge Building
(951) 827-3113; www.math.ucr.edu

Professors

John C. Baez, Ph.D.
Mei-Chu Chang, Ph.D.
Vijayanthi Chari, Ph.D.
Gerhard Gierz, Ph.D.
Michel L. Lapidus, Ph.D.
Yat Sun Poon, Ph.D.
Ziv Ran, Ph.D.
Malempati M. Rao, Ph.D.
David E. Rush, Ph.D.
Reinhard Schultz, Ph.D.
Bun Wong, Ph.D.
Feng Xu, Ph.D.
Qi S. Zhang, Ph.D.

Professors Emeriti

Theodore J. Barth, Ph.D.
Richard E. Block, Ph.D.
Bruce L. Chalmers, Ph.D.
John E. de Pillis, Ph.D.
Neil E. Gretsky, Ph.D.
Lawrence H. Harper, Ph.D.
Frederic T. Metcalf, Ph.D.
J. Keith Oddson, Ph.D.
Louis J. Ratliff, Jr., Ph.D.
Victor L. Shapiro, Ph.D.
James D. Stafney, Ph.D.
Albert R. Stralka, Ph.D.

Associate Professors

Le Baron O. Ferguson, Ph.D.
Zhang-Dan Guan, Ph.D.
Frederick H. Wilhelm, Jr., Ph.D.
Stefano Vidussi, Ph.D.

Assistant Professors

Marta Asaeda, Ph.D.
Julia Bergner, Ph.D.
Vasily Dolgushev, Ph.D.
Wee Liang Gan, Ph.D.
Jacob Greenstein, Ph.D.
James Kelliher, Ph.D.

**

Cooperating Faculty

Bai-Lian "Larry" Li, Ph.D. (Botany and Plant Sciences)

Major

The Department of Mathematics offers a B.A. and B.S. degree in programs that share a common, solid mathematical foundation but differ in their specializations in the pure and applied areas of mathematics. These programs can provide the basis for careers in mathematics itself or within the many scientific and business fields, which, in today's technological society, depend on a basic knowledge of mathematical methods.

The **B.A. in Mathematics**, following the liberal arts tradition, combines a broad coverage of the humanities and social sciences with a moderate amount of advanced mathematics in the major. It is selected most often either by students who intend to obtain a teaching credential with a specialty in mathematics or by students who wish to pursue graduate work in business or the social sciences.