

**Fall 2008 CEAS Undergraduate/Graduate and Graduate Evening Courses
(i.e. starting after 4 pm)**

Civil Engineering

CIV ENG-413: Environmental Engineering
CIV ENG-511: Water Supply and Sewerage
CIV ENG-594: Physical Planning and Municipal Engineering
CIV ENG-598: Pavement Analysis and Design
CIV ENG-691: Computational Hydrodynamics of Environmental Flows
CIV ENG-716: Sediment and Pollutant Transport
CIV ENG-721: Advanced Water Analysis
CIV ENG-732: Fatigue in Engineering Materials
CIV ENG-775: Analysis and Design of Bridges
CIV ENG-891: Inorganic Binders and Cements

Computer Science

COMPSCI-536: Software Engineering
COMPSCI-537: Introduction to Operating Systems
COMPSCI-557: Introduction to Database Systems
COMPSCI-704: Analysis of Algorithms
COMPSCI-720: Computational Models of Decision Making
COMPSCI-732: Type Systems for Programming Languages
COMPSCI-747: Human-Computer Interaction
COMPSCI-759: Data Security
COMPSCI-790: Software Engineering Project Management:
COMPSCI-859: Advanced Cryptography and Security Protocols

Industrial Engineering

IND ENG-467: Introductory Statistics for Physical Sciences and Engineering Students

IND ENG-470: Methods Engineering

IND ENG-590: 6 Sigma

IND ENG-751: Flexible Manufacturing Systems

IND ENG-783: Advanced Ergonomics - Upper Extremity

Electrical Engineering

ELECENG-438: Bioanalytics and Biomedical Diagnostics

ELECENG-457: Digital Logic Laboratory

ELECENG-471: Electric Power Systems

ELECENG 474(402): Introduction to Control Systems

ELECENG 490(690): Introduction to Bio-Optical Imaging

ELECENG-565: Optical Communication

ELECENG-575: Analysis of Electric Machines and Motor Drives

ELECENG-588: Fundamentals of Nanotechnology

ELECENG-701: Advanced Linear System Analysis

ELECENG-810: Advanced Digital Signal Processing

ELECENG-816: Optimal Control Theory

ELECENG-890: Special Topics: Introduction to Bio-Optical Imaging

Materials

MATLENG-442: Thermodynamics of Materials (3 credits; U/G)

MATLENG-443: Transport and Kinetics in Materials Processing (3 credits; U/G)

MATLENG-702: Advanced Engineering Thermodynamics (3 credits; G)

Mechanical Engineering

MECHENG-463: Introduction to Finite Elements
MECHENG-474: Introduction to Control Systems
MECHENG-476: Introduction to Robotics
MECHENG-479: Control and Design of Mechatronic Systems
MECHENG-701: Advanced Linear System Analysis
MECHENG-707: Transport in Porous Media
MECHENG-715: Numerical Methods in Engineering
MECHENG-725: Fluid Power and Turbomachinery
MECHENG-816: Optimal Control Theory

Civil Engineering

☐ **CIV ENG-413: Environmental Engineering** (3 credits; U/G; FEE)

Water pollution and control; hazardous substances and risk assessment; water and wastewater treatment systems; air-pollution and emission control; solid wastes; design of treatment facilities.

Notes:

Prereq: jr st & admis to an Eng major or grad st; MechEng 320(P).

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-------|---------|---------|--------|-----------------|------|-------------|------------|----------|
| (FEE) | 3 | LEC 001 | 37824 | 5:30 PM-6:45 PM | TR | 09/02-12/11 | | EMS E237 |

☐ **CIV ENG-511: Water Supply and Sewerage** (3 credits; U/G)

Resources of water supply quality and quantity requirements. Principles of hydraulic design of water supply and sewerage systems; pumping stations. Principles of sewage disposal. Problems of management involving hydrological, engineering, institutional, legal and economic aspects. Design project.

Notes:

Prereq: jr st; Civ Eng 411(P).

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-----|---------|---------|--------|-----------------|------|-------------|------------|----------|
| | 3 | LEC 001 | 37162 | 4:00 PM-5:15 PM | TR | 09/02-12/11 | | EMS E295 |

☐ **CIV ENG-594: Physical Planning and Municipal Engineering** (3 credits; U/G)

Organization and structure of local government, zoning and planning, subdivision layout, street design, transit service, urban drainage, storm and sanitary sewer, water supply and other public works activities.

Notes:

Prereq: sr st & cons instr.

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-----|---------|---------|--------|-----------------|------|-------------|------------|----------|
| | 3 | LEC 001 | 37712 | 5:30 PM-6:45 PM | MW | 09/02-12/11 | | EMS E160 |

☐ **CIV ENG-598: Pavement Analysis and Design** (3 credits; U/G)

Pavement types, design factors, traffic loading and volume, materials characterization, drainage design, flexible and rigid pavements design, stresses and deflections, overlay design, pavement rehabilitation.

Notes:

Prereq: jr st & Civ Eng 335(P); or grad st. Consent required to audit

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-----|---------|---------|--------|-----------------|------|-------------|------------|----------|
| | 3 | LEC 001 | 60206 | 7:00 PM-8:15 PM | TR | 09/02-12/11 | Titi, Hani | EMS E150 |

☐ **CIV ENG-691: Topics in Civil Engineering:** (1 - 3 credits; U/G)

Topics vary. Study of topics in theory and practice of civil engineering. Specific topics and any additional prerequisites will be announced in Schedule of Classes each time the course is offered.

Notes:

Retakeable for max of 6 cr. Prereq: jr st.

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-----|---------|--|--------|-----------------|------|-------------|------------|----------|
| | | Computational Hydrodynamics of Environmental Flows | | | | | | |
| | 3 | LEC 001 | 37774 | 5:30 PM-6:45 PM | MW | 09/02-12/11 | | EMS W130 |

☐ **CIV ENG-716: Sediment and Pollutant Transport** (3 credits; G)

Sediment properties; incipient motion, bed forms, suspended load, bed load, river processes. Pollutant diffusion theories; longitudinal dispersion, vertical and transverse mixing in open channel flow.

Notes:

Prereq: grad st; Civ Eng 411(P).

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-----|---------|---------|--------|-----------------|------|-------------|------------|----------|
| | 3 | LEC 001 | 59597 | 5:30 PM-6:45 PM | TR | 09/02-12/11 | | EMS E230 |

☐ **CIV ENG-721: Advanced Water Analysis** (3 credits; G)

Advanced analytical methods for evaluating sources, distribution patterns, concentrations, and biological effects of pollutants in natural waters. Tracers, nuclear techniques, organics, metals, bioassays. Lecture and laboratory.

Notes:

Prereq: grad st; Civ Eng 521(P) or cons instr.

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-----|---------|---------|--------|-----------------|------|-------------|------------|---------|
| | 3 | LEC 001 | 59598 | 5:30 PM-6:45 PM | MW | 09/02-12/11 | | PHY 146 |

☐ **CIV ENG-732: Fatigue in Engineering Materials** (3 credits; G)

Influence of repeated stress in engineering design, fatigue testing machines, and procedures, factors influencing fatigue properties, theories of fatigue failure.

Notes:

Prereq: Civ Eng 401(P) or cons instr.

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-----|---------|---------|--------|-----------------|------|-------------|------------|----------|
| | 3 | LEC 001 | 37708 | 5:30 PM-8:10 PM | R | 09/02-12/11 | | EMS W120 |

☐ **CIV ENG-775: Analysis and Design of Bridges** (3 credits; G)

Bridge types; loads and AASHTO specifications; analysis and design of superstructures; substructure design; computer applications.

Notes:

Prereq: grad st; Civ Eng 463(P); 571(P); 572(P) or cons instr.

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-----|---------|---------|--------|-----------------|------|-------------|------------|----------|
| | 3 | LEC 001 | 59599 | 5:30 PM-8:10 PM | T | 09/02-12/11 | | EMS W110 |

☐ **CIV ENG-891: Advanced Topics in Civil Engineering:** (1 - 3 credits; G; FEE)

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-------|---------|-------------------------------|--------|-----------------|------|-------------|---------------------|----------|
| | | Inorganic Binders and Cements | | | | | | |
| (FEE) | 3 | LEC 002 | 59601 | 5:30 PM-8:10 PM | W | 09/02-12/11 | Sobolev, Konstantin | EMS W110 |

Computer Science

☐ **COMPSCI-536: Software Engineering** (3 credits; U/G; FEE)

Software engineering, the software life cycle, qualities of software; design, specification and verification of software, programming environments and tools, object oriented programming.

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-------|---------|---------|--------|-----------------|------|-------------|---------------|----------|
| (FEE) | 3 | LEC 001 | 37200 | 4:00 PM-5:15 PM | MW | 09/02-12/11 | David, George | EMS E295 |
| (FEE) | 3 | LEC 002 | 59137 | 7:00 PM-8:15 PM | T | 09/02-12/11 | | EMS E237 |

☐ **COMPSCI-537: Introduction to Operating Systems** (4 credits; U/G; FEE)

Process management including scheduling, concurrency, synchronization, and deadlock; memory management, I/O management and disk scheduling, file systems, distributed operating systems. Systems programming.

Notes:

Prereq: jr st; CompSci 431(631)(P) or 535(P); grades of C or better in CompSci 315(215)(P) & 317(217)(P).Consent required to audit

Enroll in LEC 401 & any DIS 601-602

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-------|---------|---------|--------|-----------------|------|-------------|--------------|----------|
| (FEE) | 4 | LEC 401 | 37202 | 4:00 PM-5:15 PM | TR | 09/02-12/11 | Goyal, Mukul | EMS E190 |
| (FEE) | 4 | DIS 601 | 37204 | 3:00 PM-3:50 PM | T | 09/02-12/11 | | EMS W120 |
| (FEE) | 4 | DIS 602 | 37762 | 5:30 PM-6:20 PM | T | 09/02-12/11 | | EMS W130 |

☐ **COMPSCI-557: Introduction to Database Systems** (3 credits; U/G; FEE)

General database system concepts. Physical data organization. Data models and database systems. Database design theory. Query optimization. Transaction management. Logic and database.

Notes:

Prereq: jr st; CompSci 315(215)(P) & 251(P) or equiv.

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-------|---------|---------|--------|-----------------|------|-------------|---------------|----------|
| (FEE) | 3 | LEC 002 | 59140 | 7:00 PM-8:15 PM | R | 09/02-12/11 | McNally, Paul | EMS E237 |

☐ **COMPSCI-704: Analysis of Algorithms** (3 credits; G; FEE)

Introduction to concrete complexity theory and efficient algorithms. Fast data structure and graph algorithms, matrix multiplication, algebraic and numeric algorithms, reducibilities and np-completeness. Exponential and non-elementary lower bounds.

Notes:

Prereq: grad st; CompSci 217(P) & 535(P).

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-------|---------|---------|--------|-----------------|------|-------------|------------------|----------|
| (FEE) | 3 | LEC 001 | 37210 | 4:00 PM-5:15 PM | TR | 09/02-12/11 | Cheng, Christine | EMS E250 |

☐ **COMPSCI-720: Computational Models of Decision Making** (3 credits; G)

Theoretical foundations and practical problems of formulating and constructing computational models of decision making.

Notes:

Prereq: basic course in Probability or Statistics.

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-----|---------|---------|--------|-----------------|------|-------------|------------|----------|
| | 3 | LEC 001 | 37572 | 7:00 PM-8:15 PM | MW | 09/02-12/11 | Mali, Amol | EMS E225 |

☐ **COMPSCI-732: Type Systems for Programming Languages** (3 credits; G)

Lambda calculus, simple types, record types, subtypes, polymorphic types, type reconstruction, universal types, bounded quantification, higher-order types.

Notes:

Prereq: grad st; CompSci 431(P) & 654(P). Consent required to audit

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-----|---------|---------|--------|-----------------|------|-------------|---------------|----------|
| | 3 | LEC 001 | 59146 | 5:30 PM-6:45 PM | TR | 09/02-12/11 | Boyland, John | EMS E150 |

☐ **COMPSCI-747: Human-Computer Interaction** (3 credits; G)

Survey of principles, practice, and current research in human-computer interaction including hci theories, design processes, assessment techniques, and tools.

Notes:

Prereq: grad st. Consent required to audit

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-----|---------|---------|--------|-----------------|------|-------------|---------------|----------|
| | 3 | LEC 002 | 60242 | 5:30 PM-6:45 PM | M | 09/02-12/11 | Munson, Ethan | EMS E159 |

☐ **COMPSCI-759: Data Security** (3 credits; G)

Protection of data in computer and communication systems, cryptography, classical one key and public key cryptosystems, database protection, operating system security.

Notes:

Prereq: grad st; CompSci 217(P) & 536(P).

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-----|---------|---------|--------|-----------------|------|-------------|-----------------|----------|
| | 3 | LEC 001 | 37638 | 5:30 PM-6:45 PM | MW | 09/02-12/11 | Daivida, George | EMS E230 |

☐ **COMPSCI-790: Advanced Topics in Computer Science:** (3 credits; G; FEE)

Discussion of special advanced topics in theoretical as well as applied areas in computer science.

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-----|---------|---|--------|-----------------|------|-------------|------------------|----------|
| | | Software Engineering Project Management | | | | | | |
| | (FEE) 3 | LEC 001 | 37216 | 7:00 PM-8:15 PM | TR | 09/02-12/11 | El Afandi, Hamed | EMS E225 |

☐ **COMPSCI-859: Advanced Cryptography and Security Protocols** (3 credits; G)

Elliptic curve cryptography, AES, cryptanalysis, secret sharing, zero knowledge proofs, provable security.

Notes:

Prereq: grad st; CompSci 469(P) & CompSci 535(P), or CompSci 759(P)

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-----|---------|---------|--------|-----------------|------|-------------|-------------|----------|
| | 3 | LEC 001 | 59149 | 7:00 PM-8:15 PM | MW | 09/02-12/11 | Xu, Guangwu | EMS E237 |

Industrial Engineering

▣ **IND ENG-467: Introductory Statistics for Physical Sciences and Engineering Students** (3 credits; U/G; FEE)

Concepts of probability and statistics; probability distributions of engineering applications; sampling distributions; hypothesis testing; parameter estimation; regression analysis.

Not open for cr for Math majors or students with cr in MthStat 362 or 465. IndEng 467 & MthStat 467 are jointly offered & count as repeats of one another. Prereq: jr st; Math 233(P).

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-------|---------|---------|--------|-----------------|------|-------------|-------------------|----------|
| (FEE) | 3 | LEC 002 | 37308 | 4:00 PM-5:15 PM | MW | 09/02-12/11 | Seifoddini, Hamid | EMS E250 |

▣ **IND ENG-470: Methods Engineering** (3 credits; U/G)

Use of production machine for producing a simple product. Study of production sequence, material flow, plant layout; time and motion; and the economics of materials and methods of fabrication. Redesign of the product and the methods of production to minimize total costs within physical, social and aesthetic constraints.

Prereq: jr st; Ind Eng 370(P). Consent required to audit
Enroll in LEC 401 & LAB 801

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-----|---------|---------|--------|-----------------|------|-------------|------------|----------|
| | 3 | LEC 401 | 37750 | 5:30 PM-7:10 PM | M | 09/02-12/11 | | EMS E295 |
| | 3 | LAB 801 | 37760 | 7:20 PM-9:00 PM | M | 09/02-12/11 | | EMS E295 |

IND ENG-590: Topics in Industrial and Systems Engineering: (1 - 3 credits; U/G)

Selected topics of current interest in an area of systems design.

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-----|---------|---------|--------|-----------------|------|-------------|------------|----------|
| | 6 Sigma | | | | | | | |
| | 3 | LEC 002 | 59637 | 5:30 PM-8:10 PM | R | 09/02-12/11 | | EMS W110 |

IND ENG-751: Flexible Manufacturing Systems (3 credits; G)

Hierarchy of manufacturing control, process control, advanced concepts in fms, optimal design planning and production scheduling in fms.

Notes:

Prereq: grad st; Ind Eng 450 & 455.

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-----|---------|---------|--------|-----------------|------|-------------|-------------------|----------|
| | 3 | LEC 001 | 59638 | 5:30 PM-8:10 PM | W | 09/02-12/11 | Seifoddini, Hamid | EMS E295 |

IND ENG-783: Advanced Ergonomics - Upper Extremity (3 credits; G)

In depth study of musculoskeletal disorders of upper extremity, personal and job risk factors, job analysis, design and prevention. 2 hr lec & 2 hr lab/week.

Notes:

Prereq: grad st; Ind Eng 580(P); a course in Anatomy & Physiology or cons instr.

Enroll in LEC 401 & LAB 801

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-----|---------|---------|--------|-----------------|------|-------------|------------|----------|
| | 3 | LEC 401 | 59639 | 5:30 PM-7:10 PM | M | 09/02-12/11 | Garg, Arun | EMS W110 |
| | 3 | LAB 801 | 59640 | 7:20 PM-9:00 PM | M | 09/02-12/11 | | EMS W110 |

Electrical Engineering

▣ **ELECENG-438: Bioanalytics and Biomedical Diagnostics** (3 credits; U/G)

Techniques used in biomedical analysis and discovery; fundamentals of light/matter intersections in biological systems; microscopy and spectroscopic analysis; biomolecular sensing; DNA microarrays and analysis; bionanotechnology.

Notes:

Counts as repeat of ElecEng 490 with topic 'Bioanalytics & Biomedical Diagnostics.' Prereq: sr st; ElecEng 310(P) and ElecEng 330(P) or cons instr. Consent required to audit

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-----|---------|---------|--------|-----------------|------|-------------|---------------|----------|
| | 3 | LEC 001 | 59624 | 5:30 PM-8:10 PM | T | 09/02-12/11 | Klemer, David | EMS W120 |

▣ **ELECENG-457: Digital Logic Laboratory** (3 credits; U/G; FEE)

Experimentation with digital logic systems. Synthesis of digital systems, such as adders, shift registers. Analog/digital and digital/analog converters from basic logic modules.

Notes:

Prereq: jr st; ElecEng 330(P), 354(P).

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-------|---------|---------|--------|-----------------|------|-------------|----------------|----------|
| (FEE) | 3 | LEC 001 | 37290 | 6:00 PM-8:45 PM | R | 09/02-12/11 | Cummins, James | EMS E203 |

▣ **ELECENG-471: Electric Power Systems** (3 credits; U/G)

Elements of a typical power system. Per-unit quantities; load flow study; economic dispatch; symmetrical components; fault study; system protection; stability.

Notes:

Prereq: jr st; ElecEng 362(C).

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-----|---------|---------|--------|-----------------|------|-------------|------------|----------|
| | 3 | LEC 001 | 37292 | 4:00 PM-5:15 PM | MW | 09/02-12/11 | | EMS W110 |

▣ **ELECENG 474(402): Introduction to Control Systems** (4 credits; U/G; FEE)

Modeling of continuous systems; stability considerations, analysis and design of feedback control systems in time and frequency domains.

Not open for cr to students w/cr in ElecEng 402. Prereq: jr st; ElecEng 310(P), CivEng 202(P) or cons instr; or grad st. Consent required to audit

Enroll in LEC 401 & any LAB 801-804. Student must be admitted to Engineering major.

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-------|---------|---------|--------|-----------------|------|-------------|------------|----------|
| (FEE) | 4 | LEC 401 | 37730 | 5:30 PM-6:45 PM | MW | 09/02-12/11 | | EMS E145 |
| (FEE) | 4 | LAB 801 | 37732 | 8:00 AM-9:50 AM | M | 09/02-12/11 | | PHY B47 |
| (FEE) | 4 | LAB 802 | 37734 | 7:00 PM-8:50 PM | W | 09/02-12/11 | | PHY B47 |
| (FEE) | 4 | LAB 803 | 37736 | 7:00 PM-8:50 PM | M | 09/02-12/11 | | PHY B47 |
| (FEE) | 4 | LAB 804 | 37854 | 8:00 AM-9:50 AM | F | 09/02-12/11 | | PHY B47 |

ELECENG 490(690): Topics in Electrical Engineering: (1 - 3 credits; U/G; FEE)

Specific topics, credits, and any additional prerequisites will be announced in the Schedule of Classes each time the course is offered.

Notes:

May be retaken with change in topic to max of 9 cr. Prereq: jr st.

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-------|---------|-------------------------------------|--------|-----------------|------|-------------|------------|---------|
| | | Introduction to Bio-Optical Imaging | | | | | | |
| (FEE) | 3 | LEC 001 | 37630 | 5:30 PM-8:10 PM | W | 09/02-12/11 | Zhang, Hao | PHY 145 |

ELECENG-565: Optical Communication (3 credits; U/G)

Overview of communication systems, light and electromagnetic waves, optical fibers, lasers, led, photodetectors, receivers, optical fiber communication systems.

Notes:

Prereq: sr st; ElecEng 361(P), & 330(P) or 465(P).

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-----|---------|---------|--------|-----------------|------|-------------|------------|---------|
| | 3 | LEC 001 | 59625 | 6:30 PM-7:45 PM | TR | 09/02-12/11 | Law, Chiu | PHY 145 |

▣ **ELECENG-575: Analysis of Electric Machines and Motor Drives** (3 credits; U/G)

Reference frame analysis, computer simulation, permanent magnet synchronous machines, induction machines, power electronic inverters, pulsewidth modulation, vector control.

Notes:

Prereq: jr st, ElecEng 330(P) & 362(P). Consent required to audit

Not open to University Special Students

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-----|---------|---------|--------|-----------------|------|-------------|---------------------|----------|
| | 3 | LEC 001 | 59626 | 5:30 PM-8:10 PM | M | 09/02-12/11 | Nasiri, Abdolhosein | EMS W120 |

▣ **ELECENG-588: Fundamentals of Nanotechnology** (3 credits; U/G)

Nanofabrication, self-assembly, principles of scanning tunneling/atomic force microscopy, operators, energy quantization; density of states, quantum dots, nanowires, carbon nanotubes: electronic properties and applications.

Notes:

Prereq: jr st; non-ElecEng majors; ElecEng 361(P) or equiv.

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-----|---------|---------|--------|-----------------|------|-------------|------------------|----------|
| | 3 | LEC 001 | 59627 | 4:00 PM-5:15 PM | TR | 09/02-12/11 | Kouklin, Nikolai | EMS E170 |

▣ **ELECENG-701: Advanced Linear System Analysis** (3 credits; G)

Theory and analysis of linear dynamic systems; discrete and continuous state models; linear algebra for dynamic systems; state transition matrix, numerical methods; and applications.

Notes:

ElecEng 701 & MechEng 701 are jointly offered and count as repeats of one another. Prereq: grad st.

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-----|---------|---------|--------|-----------------|------|-------------|------------------|---------|
| | 3 | LEC 001 | 37640 | 5:30 PM-8:10 PM | T | 09/02-12/11 | Armstrong, Brian | PHY 144 |

▣ **ELECENG-810: Advanced Digital Signal Processing** (3 credits; G)

Prediction and optimum filters; lattice structures; adaptive filters; deconvolution techniques, spectrum estimation, applications.

Notes:

Prereq: grad st; ElecEng 410(P).

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-----|---------|---------|--------|-----------------|------|-------------|------------|----------|
| | 3 | LEC 001 | 59629 | 5:30 PM-8:10 PM | M | 09/02-12/11 | Zhang, Jun | EMS E228 |

Materials

☐ **MATLENG-442: Thermodynamics of Materials** (3 credits; U/G)

Third law of thermodynamics; application of thermodynamics to materials processes and systems; behavior of solutions; reaction equilibria.

Notes:

Prereq: jr st, admis to MatlEng major, MatlEng 201(P), & MechEng 301(P); or grad st; or cons dept chair.

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-----|---------|---------|--------|------------------|------|-------------|------------------|----------|
| | 3 | LEC 001 | 37340 | 9:30 AM-10:45 AM | TR | 09/02-12/11 | Neumann, Joachim | EMS E230 |

☐ **MATLENG-443: Transport and Kinetics in Materials Processing** (3 credits; U/G)

The role of kinetics in materials processing including transport of mass, energy, and momentum.

Notes:

Prereq: jr st, MatlEng 442(P), & ElecEng 234 (P); or grad st.

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-----|---------|---------|--------|-----------------|------|-------------|------------------------|----------|
| | 3 | LEC 001 | 37674 | 5:30 PM-8:10 PM | M | 09/08-12/13 | Venugopalan, Devarajan | EMS W119 |

☐ **MATLENG-702: Advanced Engineering Thermodynamics** (3 credits; G)

Laws of thermodynamics, property relations, and equations of state, introduction to statistical and irreversible thermodynamics; applications to perfect gases, perfect crystals, and homogeneous solutions.

Notes:

Prereq: grad st; MatlEng 441(P), 442(P).

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-----|---------|---------|--------|-----------------|------|-------------|------------------|---------|
| | 3 | LEC 001 | 59784 | 5:30 PM-6:45 PM | TR | 09/02-12/11 | Neumann, Joachim | PHY 230 |

Mechanical Engineering

☐ **MECHENG-463: Introduction to Finite Elements** (3 credits; U/G; FEE)

Generation and assembly of finite element matrices in one and two-dimensional problems. Modeling and practical applications in solid mechanics, heat transfer and fluid flow.

Notes:

Not open to students with cr in Civ Eng 463(ER). Prereq: ElecEng 234(P), Civ Eng 303(P); MechEng 320(C), 311(C) or 321(C).

Student must be admitted to Engineering major. Enroll in LEC 401 & any DIS 601- 602.

| GER | | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-----|-------|---------|---------|--------|------------------|------|-------------|------------|----------|
| | (FEE) | 3 | LEC 401 | 37392 | 5:30 PM-6:20 PM | TR | 09/02-12/11 | | EMS E295 |
| | (FEE) | 3 | DIS 601 | 37402 | 12:00 PM-1:50 PM | F | 09/02-12/11 | | EMS E285 |
| | (FEE) | 3 | DIS 602 | 37404 | 2:00 PM-3:50 PM | F | 09/02-12/11 | | EMS E285 |

☐ **MECHENG-474: Introduction to Control Systems** (4 credits; U/G; FEE)

Modeling of continuous systems; stability considerations, analysis and design of feedback control systems in time and frequency domains.

Notes:

Prereq: sr st; ElecEng 234(P), 301(P); Civ Eng 202(P).

Student must be admitted to Engineering major. Enroll in LEC 401 & any LAB 801-804

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-------|---------|---------|--------|-----------------|------|-------------|------------|----------|
| (FEE) | 4 | LEC 401 | 37374 | 5:30 PM-6:45 PM | MW | 09/02-12/11 | | EMS E145 |
| (FEE) | 4 | LAB 801 | 37376 | 8:00 AM-9:50 AM | M | 09/02-12/11 | | PHY B47 |
| (FEE) | 4 | LAB 802 | 37378 | 7:00 PM-8:50 PM | W | 09/02-12/11 | | PHY B47 |
| (FEE) | 4 | LAB 803 | 37380 | 7:00 PM-8:50 PM | M | 09/02-12/11 | | PHY B47 |
| (FEE) | 4 | LAB 804 | 37852 | 8:00 AM-9:50 AM | F | 09/02-12/11 | | PHY B47 |

☐ **MECHENG-476: Introduction to Robotics** (3 credits; U/G)

Fundamentals of manipulators, sensors, actuators, end-effectors and product design for automation, computer vision and pattern recognition.

Notes:

Prereq: ElecEng 234(P), MechEng 360(P).

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-----|---------|---------|--------|-----------------|------|-------------|------------|----------|
| | 3 | LEC 002 | 60195 | 5:30 PM-6:45 PM | MW | 09/02-12/11 | | EMS E237 |

MECHENG-479: Control and Design of Mechatronic Systems (3 credits; U/G; FEE)

Understanding interfacing of mechanical systems using electro-mechanical components; conceptual design and analysis of high performance computer controlled mechanical systems; prototyping of mechatronic systems.

Notes:

Prereq: sr st or cons instr; ElecEng 474(402)(P) or MechEng 474(P). Consent required to audit
Student must be admitted to Engineering major. Enroll in LEC 401 & any LAB 801-804

| GER | | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-----|-------|---------|---------|--------|-----------------|------|-------------|------------|----------|
| | (FEE) | 3 | LEC 401 | 37384 | 4:00 PM-4:50 PM | TR | 09/02-12/11 | | EMS E237 |
| | (FEE) | 3 | LAB 801 | 37386 | 8:00 AM-9:50 AM | T | 09/02-12/11 | | EMS 862 |
| | (FEE) | 3 | LAB 802 | 37388 | 8:00 AM-9:50 AM | R | 09/02-12/11 | | EMS 862 |
| | (FEE) | 3 | LAB 803 | 37406 | 8:00 AM-9:50 AM | W | 09/02-12/11 | | EMS 862 |
| | (FEE) | 3 | LAB 804 | 37850 | 8:00 AM-9:50 AM | M | 09/02-12/11 | | EMS 862 |

☐ **MECHENG-701: Advanced Linear System Analysis** (3 credits; G)

Theory and analysis of linear dynamic systems; discrete and continuous state models; linear algebra for dynamic systems; state transition matrix, numerical methods; and applications.

Notes:

ElecEng 701 & MechEng 701 are jointly offered and count as repeats of one another. Prereq: grad st.

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-----|---------|---------|--------|-----------------|------|-------------|------------------|---------|
| | 3 | LEC 001 | 59633 | 5:30 PM-8:10 PM | T | 09/02-12/11 | Armstrong, Brian | PHY 144 |

☐ **MECHENG-707: Transport in Porous Media** (3 credits; G)

Introduction to fluid mechanics in porous media, single- and multi-phase flows, volume averaged transport equations, convection heat transfer, consolidating porous media, volume averaging theory, applications.

Notes:

Prereq: grad st.

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-----|---------|---------|--------|-----------------|------|-------------|------------|----------|
| | 3 | LEC 001 | 59283 | 4:30 PM-7:10 PM | T | 09/02-12/11 | | EMS E159 |

☐ **MECHENG-715: Numerical Methods in Engineering** (3 credits; G)

Differential equation solutions with finite difference and finite volume methods; grid generation technique; finite element methods; applications to solid mechanics, heat transfer, and fluid mechanics.

Notes:

Prereq: grad st; Math 413(P) or cons instr.

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-----|---------|---------|--------|-----------------|------|-------------|------------|---------|
| | 3 | LEC 001 | 59290 | 4:30 PM-7:10 PM | W | 09/02-12/11 | | PHY 230 |

☐ **MECHENG-725: Fluid Power and Turbomachinery** (2 credits; G)

Concept of hydraulic systems; hydraulic motors; valves; hydraulic circuits; pneumatic systems; axial and radial gas turbines, pumps, compressors; steam turbines; hydraulic turbines; wind turbines.

Notes:

Prereq: grad st; MechEng 320(P).

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-----|---------|---------|--------|-----------------|------|-------------|------------|---------|
| | 2 | LEC 001 | 59291 | 4:30 PM-7:10 PM | M | 09/02-12/11 | | PHY 145 |

MECHENG-816: Optimal Control Theory (3 credits; G)

Analysis and synthesis of discrete and continuous optimal control systems; linear quadratic regulators; dynamic programming and variational methods; applications.

Notes:

ElecEng 816 & MechEng 816 are jointly offered and count as repeats of one another. Prereq: grad st; ElecEng or MechEng474(P) or equiv; ElecEng or MechEng 701(P); or cons instr. Consent required to audit

| GER | Credits | Section | Class# | Hours | Days | Dates | Instructor | Room |
|-----|---------|---------|--------|-----------------|------|-------------|------------|----------|
| | 3 | LAB 801 | 59294 | 4:30 PM-7:10 PM | W | 09/02-12/11 | | EMS W120 |