

## Summer School 2009 Course List

### BIOMEDICAL ENGINEERING (E62)

<b>**</b> <b>Departmental</b> <b>Section/</b> <b>Faculty list for</b> <b>research,</b> <b>project and</b> <b>other related</b> <b>courses:</b> <b>01 Arthur</b> <b>02 Snyder</b> <b>03 Bayly</b> <b>04 Moran</b> <b>05 Sept</b>	<b>06 Kovacs</b> <b>09 Wickline</b> <b>10 Taber</b> <b>11 Mitra</b> <b>12</b> <b>Brandenburger</b> <b>13 Xia</b> <b>14 Yin</b> <b>15 Okamoto</b> <b>16 Sutera</b> <b>17 Barbour</b> <b>19 Tsekos</b> <b>20 Cui</b>	<b>21 Culver</b> <b>22 Mislser</b> <b>23 Jay</b> <b>24 Efimov</b> <b>26 Richard</b> <b>27 Elson</b> <b>28 Rudy</b> <b>29 O'Sullivan</b> <b>30 Shao</b> <b>31 Miller</b> <b>32 Low</b> <b>34 Marshall</b> <b>35 Bridgman</b>	<b>36 Ponder</b> <b>37 Brent</b> <b>38 Silva</b> <b>39 Elbert, D.</b> <b>40 Deangelis</b> <b>41 Sakiyama-</b> <b>Elbert</b> <b>43 Lichtman</b> <b>44 Pappu</b> <b>45 Stormo</b> <b>46 Angelaki</b> <b>47 Wilkinson</b>	<b>48</b> <b>Thoroughman</b> <b>49 Gish</b> <b>50 Lanza</b> <b>51 Burton</b> <b>52 Guallar</b> <b>53</b> <b>Thomopoulos</b> <b>54 Gottlieb</b> <b>55 Wang</b> <b>56 Klaesner</b> <b>57 Leuthardt</b> <b>58 Klyachko</b>
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#### INDEPENDENT STUDY

E62 400 BME

Refer to \*\*section/faculty list at start of departmental entry for selections in this course.

Prerequisites: junior or senior standing and permission of program director

Credit variable, max 6 units

#### INDEPENDENT STUDY

E62 500 BME

All sections TBA

Refer to \*\*section/faculty list at start of departmental entry for selections in this course.

Credit variable, max 6 units

#### MASTERS RESEARCH

E62 599 BME

All sections TBA

Refer to \*\*section/faculty list at start of departmental entry for selections in this course.

Credit variable, max 6 units

#### DOCTORAL RESEARCH

E62 600 BME

All sections TBA

Refer to \*\*section/faculty list at start of departmental entry for selections in this course.

Credit variable, max 24 units

## CHEMICAL ENGINEERING (E63)

**\*\* Departmental  
Section/Faculty list  
for research,  
project and other  
related courses:  
01 Al-Dahhan  
02 Angenent**

**03 Axelbaum  
04 Biswas  
05 Chen  
06 Dudukovic  
07 Giammar  
08 Gleaves  
09 Husar**

**10 Pakrasi  
11 Ramachandran  
12 Jun  
13 Sureshkumar  
14 Turner  
15 Falke  
16 Ravi**

**17 McKelvey  
18 Nissing  
19 Lipeles  
20 Lo  
21 Kalyanaraman  
22 Tang**

### INDEPENDENT STUDY

E63 400 CHE

Prerequisite: junior or senior standing

All sections TBA

Refer to \*\*section/faculty list at start of departmental entry for selections in this course.

Credit variable, max 9 units

### INDEPENDENT STUDY

E63 500 CHE

All sections TBA.

Refer to \*\*section/faculty list at start of departmental entry for selections in this course.

Credit variable, max 9 units

### MASTERS RESEARCH

E63 599 CHE

All sections TBA.

Refer to \*\*section/faculty list at start of departmental entry for selections in this course.

Credit variable, max 9 units

### DOCTORAL RESEARCH

E63 600 CHE

All sections TBA.

Refer to \*\*section/faculty list at start of departmental entry for selections in this course.

Credit variable, max 9 units

## COMPUTER SCIENCE & ENGINEERING (E81)

\*\* Departmental  
Section/Faculty list  
for research project  
and other related  
courses:  
04 Brent  
05 Cox  
07 Gill  
08 Franklin

09 Buhler  
11 Kuhns  
12 Lu  
13 Kimura  
14 Chamberlain  
17 Kelleher  
18 Roman  
20 Richard  
21 Wong

22 Turner  
23 Bayazit  
24 Crowley  
25 Zhang  
29 Stump  
30 Gorinsky  
31 Grimm  
32 Pless  
33 Smart

35 Chen  
37 Ju  
38 Jain  
39 S. Goldman  
40 K. Goldman  
43 Stormo  
45 Cytron

### WEB DEVELOPMENT

E81 104 CSE

This comprehensive course does not assume prior programming background or web design experience. Explores elementary principles that go into designing, creating, and publishing an effective web site. Topics include the production process, design metaphors, interface/information design, page layout concepts, graphics preparation, color theory, development tools, HTML, style sheets, basic scripting techniques, search engine optimization and site maintenance/marketing strategies.

3 units

01 TBA

Monday, Tuesday & Thursday

6/29/09 - 8/6/09

5 - 7:30 p.m.

Froderman

### INDEPENDENT STUDY

E81 400 CSE

Possible topics may be found in the Undergraduate Research Opportunities Program listing through [WUCrsl](#).

Prerequisite: junior standing.

Credit variable, max 6 units

### PATTERN ORIENTED SOFTWARE DESIGN & DEVELOPMENT

E81 432S CSE

Intensive focus on design and implementation of software using design patterns. Particular emphasis on successive refinement based on identification of unresolved design forces at each step of the design process, and on application of patterns to guide design refinement. Design implementations will be conducted in Java and C++ in a team setting, with weekly presentations and critiques of design and implementation decisions and outcomes throughout the course.

Prerequisites: CSE 332S or graduate standing, and proficiency in Java and C++ software development.

3 units

Monday & Thursday

5/18/09 - 7/9/09

5:30 p.m. - 8:30 p.m.

Gill

INDEPENDENT STUDY

E81 500 CSE

Credit variable, max 3 units

MASTERS PROJECT

E81 598 CSE

Students electing the project option for their master's degree perform their project work under this course.

Prerequisite: permission of adviser

Credit variable, max 6 units

MASTERS RESEARCH

E81 599 CSE

Prerequisite: permission of adviser

Credit variable, max 6 units

DOCTORAL RESEARCH

E81 699 CSE

Credit variable, max 9 units

## ELECTRICAL & SYSTEMS ENGINEERING (E35)

### \*\*E35

Departmental  
Section/Faculty list  
for research,  
project and other  
related courses:  
01 TBA

02 Arthur  
03 Byrnes  
05 Fuhrmann  
07 Indeck  
09 Katz  
10 Min  
11 Morley

12 Mukai  
13 O'Sullivan  
14 Pickard  
15 Rode  
16 Rodin  
17 Schaettler  
18 Shrauner

19 Snyder  
20 Spielman  
21 Tarn  
27 Nehorai  
28 Yang, L  
29 Li, Jr-Shin

### ENGINEERING MATHEMATICS

E35 317 ESE

The Laplace transform and applications; series solutions of differential equations, Bessel's equation, Legendre's equation, special functions; matrices, eigenvalues, and eigenfunctions; vector analysis and applications; boundary value problems and spectral representations; Fourier series and Fourier integrals; solution of partial differential equations of mathematical physics.

Prerequisite: Math 217 or equivalent

4 units

01 MW 5:30p-9:15p

6/8/09 - 7/6/09

Osmanagic

### MATHEMATICS OF MODERN ENGINEERING

IE35 501 ESE

Vectors and vector spaces, Matrix operations, System of linear equations, Eigenvalues and eigenvectors, Vector fields, Line and surface integrals, Solutions to ordinary and partial differential equations, Series expansions, Fourier Series.

Prerequisite: ESE 317 or equivalent or consent of instructor

3 units.

01 MTuWTh 5:30 – 8 p.m.

6/1/09 - 7/2/09

Sridharan

### MATHEMATICS OF MODERN ENGINEERING II

E35 502 ESE

Techniques of solving ordinary differential equations with constant coefficients, Laplace's Transform, solutions for the heat and wave equations, Laplace's Equation, Legendre and Bessel Function, Intro to function of a complex variable, conformal mapping, contour integrals.

Prerequisite: ESE 317 or equivalent, or consent of instructor

3 units

01 MTuWTh 5:30 – 8 p.m.

7/6/09 - 8/6/09

Sridharan

### INDEPENDENT STUDY

E35 400 ESE

Opportunities to acquire experience outside the classroom setting and to work closely with individual members of the faculty. A final report must be submitted to the department. Not open to first-year or graduate students. Consult adviser. Hours and credit to be arranged.

Credit variable, max 3 units

INDEPENDENT STUDY E35 500 ESE

Opportunities for graduate students to explore possible areas of interest with individual faculty members. Coordinated study programs dealing with areas not covered by formal course work are possible. Independent study credit can be changed to research credit (ESE 599) any time during the semester if enrollment is appropriate. A final report is required to be submitted to the Department.

Credit variable, max 3 units

MASTERS RESEARCH

E35 599 ESE

Credit variable, max 3 units

DOCTORAL RESEARCH

E35 600 ESE

Credit variable, max 9 units

## ENVIRONMENTAL ENGINEERING (E90)

**\*\* Departmental  
Section/Faculty list  
for research,  
project and other  
related courses:  
01 Al-Dahhan  
02 Angenent**

**03 Axelbaum  
04 Biswas  
05 Chen  
06 Dudukovic  
07 Giammar  
08 Gleaves  
09 Husar**

**10 Pakrasi  
11 Ramachandran  
12 Jun  
13 Sureshkumar  
14 Turner  
15 Falke  
16 Ravi**

**17 McKelvey  
18 Nissing  
19 Lipeles  
20 Lo  
21 Kalyanaraman  
22 Tang**

### INDEPENDENT STUDY

E90 500 ENV

Credit variable, max 3 units

### INTERNSHIP

E90 598 ENV

This is part of a six-credit internship program, mandatorily combined with EnvE 598A. The Environmental Engineering Program will endeavor to find a placement for all students interested in and eligible for the internship, and students are also welcome to locate placements of their choice. The student will work for a company or agency on a full-time basis for ten to twelve weeks during the summer, on environmental engineering projects assigned and supervised at the placement. The student will maintain regular communication with his or her faculty supervisor in preparation for and during the performance of the internship.

Prerequisites: B or better in all core courses taken; must have taken at least 4 core courses.

All sections TBA.

Refer to \*\*section/faculty list at start of departmental entry for selections in this course.

3 units

### INTERNSHIP PROJECT

E90 598A ENV

As an integral part of the Environmental Engineering Internship, the student will work on an in-depth research project under the joint supervision of the placement supervisor and the faculty supervisor. The project should be based on one or more assignments performed during the internship, exploring the subject in greater depth. The student must submit a written report and make a seminar presentation concerning his or her project within six weeks after the conclusion of the internship placement (or by the sixth week of the following fall semester, whichever is later).

Prerequisites: B or better in all core courses taken; must have taken at least 4 core courses.

All sections TBA.

Refer to \*\*section/faculty list at start of departmental entry for selections in this course. 3 units

### MASTER'S RESEARCH

E90 599 ENV

All sections TBA.

Refer to \*\*section/faculty list at start of departmental entry for selections in this course. Credit variable, max 9 units

### DOCTORAL RESEARCH

E90 600 ENV

All sections TBA.

Refer to \*\*section/faculty list at start of departmental entry for selections in this course.  
Credit variable, max 9 units

## GENERAL ENGINEERING (E60)

### COOPERATIVE EDUCATION EXPERIENCE

E60 100A ENGR

0 units

01 TBA

Kruessel

### COOPERATIVE EDUCATION EXPERIENCE

E60 200A ENGR

Required of all students who are currently working and who are participating in the Engineering Cooperative Education Program.

No credit.

Audit only.

0 units

01 TBA

Kruessel

### COOPERATIVE EDUCATION EXPERIENCE

E60 300A ENGR

Required of all students who are currently working and who are participating in the Engineering Cooperative Education Program.

No credit.

Audit only.

0 units

01 TBA

Kruessel

### TECHNICAL WRITING

E60 310 ENGR

Persistent concerns of grammar and style. Analysis and discussion of clear sentence and paragraph structure and of organization in complete technical documents. Guidelines for effective layout and graphics. Examples and exercises stressing audience analysis, graphic aids, editing, and readability. Videotaped work in oral presentation of technical projects. Writing assignments include descriptions of mechanisms, process instructions, basic proposals, letters and memos, and a long formal report.

Prerequisites: Satisfaction of the English composition proficiency requirement of the School and junior standing.

3 units

01 TuTh 10:00a-12:30p

6/2/09 - 7/23/09

Ballard

### COOPERATIVE EDUCATION EXPERIENCE

E60 400A ENGR

Required of all students who are currently working and who are participating in the Engineering Cooperative Education Program.

No credit.  
Audit only.  
0 units  
01 TBA  
Kruessel

COOPERATIVE EDUCATION EXPERIENCE

E60 500A ENGR

Required of all students who are currently working and who are participating in the Engineering Cooperative Education Program.

No credit.  
Audit only.  
0 units  
01 TBA  
Kruessel

COOPERATIVE EDUCATION EXPERIENCE

E60 500S ENGR

Required of all students who are currently working and who are participating in the Engineering Cooperative Education Program.

No credit.  
Audit only.  
0 units  
01 TBA  
Kruessel

## MECHANICAL, AEROSPACE & STRUCTURAL ENGINEERING (E37)

\*\* Departmental  
Section/Faculty list  
for research,  
project and other  
related courses:  
01 TBA  
02 Dyke

03 Axelbaum  
05 Truman  
06 Gould  
07 Hakkinen  
08 Harmon  
09 Agarwal  
10 Bayly

11 Sridharan  
12 Jerina  
14 Paris  
15 Peters  
16 Shen  
17 Sastry  
20 Swartwout

21 Fried  
22 Jakiela  
23 Genin  
24 Brandon  
28 Okamoto

### NANOTECHNOLOGY CONCEPTS AND APPLICATIONS

E77 463 MAE

The aim of this course is to introduce to students the general meaning, terminology and ideas behind nanotechnology and its potential application in various industries. The topics covered will include nanoparticles - properties, synthesis and applications, carbon nanotubes - properties, synthesis and applications, ordered and disordered nanostructured material and their applications, quantum wells, wires and dots, catalysis and self-assembly, polymers and biological materials, nanomanufacturing and functional nano-devices, health effects and nanotoxicity etc. The course will include several laboratory demonstrations.

Prerequisite: none, students with background in general physics, chemistry and biology should be able to comprehend the material.

3 units

01 TuWTh 5:30p-9:00p

7/20/09 - 8/13/09

Agarwal

### INDEPENDENT STUDY

E37 400 MASE

Independent investigation on topic of special interest.

Prerequisites: junior or senior standing and permission of department chair.

Credit variable, max 6 units

### INDEPENDENT STUDY

E37 500 MASE

Independent investigation on topic of special interest.

Prerequisites: graduate standing and permission of the instructor.

Credit variable, max 6 units

### MATERIALS SELECTION IN DESIGN

E37 5102 MASE

Analysis of the scientific bases of material behavior in the light of research contributions of the last 20 years. Development of a rational approach to the selection of materials to meet a wide range of design requirements for conventional and advanced applications. Although emphasis will be placed on mechanical properties, acoustical, optical, thermal and other properties of interest in design will be discussed.

3 units

01 TuTh 5:30 – 8 p.m.

6/22/09 - 8/13/09

Gomez

**SOLAR ENERGY THERMAL PROCESSES**

E37 5422 MASE

Extraterrestrial solar radiation, solar radiation on earth's surface, and weather bureau data. Review of selected topics in heat transfer. Methods of solar energy collection including flat plate and concentrating collectors. Solar energy storage. Transient and long- term solar system performance.

Prerequisites: MASE 342 or equivalent

3 units

01 TuWTh 5:30 - 9:30 p.m.

5/18/09 - 6/12/09

Brandon

**MASTERS RESEARCH**

E37 599 MASE

Credit variable, max 6 units

**DOCTORAL RESEARCH**

E37 600 MASE

Credit variable, max 9 units

## Sever Institute of Continuing Studies

\*\* Departmental Section/Faculty list for research, project and other related courses:  
01 TBA  
02 Bannes

03 Browdy  
08 Ballard  
10 Spitznagel  
15 Darte

### CONSTRUCTION MANAGEMENT (T64)

INDEPENDENT STUDY

T64 500 CNST

Prerequisite: Approval of Program Director

Credit variable, max 3 units

### SPECIAL TOPIC: SUSTAINABLE CONSTRUCTION

T64 550A CNST

The course will focus on sustainable planning, design and construction during all phases of a project. Also covered is how LEED Accredited Professionals manage the building certification process and the documents required for submittal to the USGBC to verify that the requirements for LEED certification are met. At the end of this course, students will be prepared to take the new USGBC LEED AP+ Exam Structure. Additional self-study will be required after the course to fully prepare for the exam.

Prerequisites: Graduate Standing, and CNST 573 or permission of instructor

2 units

SECT 01: This course is being taught over a three-week period on Tuesday and Thursday evenings and Saturday morning.

June 6, 11 & 13; June 16, 18 & 20; June 23, 25 & 27

01 Sa 8 a.m - noon

6/6/09 - 6/27/09

TuTh 6 – 8 p.m.

Merrill

### SPECIAL TOPIC: BUSINESS DEVELOPMENT PRINCIPLES FOR CONSTRUCTION PROFESSIONALS

T64 550B CNST

This course focuses on the foundational issues of securing new business while ensuring project and company profitability. Topics include creating and implementing marketing and business development strategies; customer relations management; Developing competitive strategies for delivering professional construction services; bidding strategies; developing public relations strategies; managerial leadership; strategic planning.

Prerequisites: CNST 573 or permission of instructor. In preparation for this course, some study materials will be provided to enrolled students approximately two weeks prior to the first meeting.

2 units

SECT 01: This course is being taught on two consecutive weekends.

July 10 & 11, and July 17 & 18

01 Sa 9 a.m. – 5 p.m.

7/10/09 - 7/18/09

F 5 p.m. – 9 p.m.

Bannes

**SPECIAL TOPIC: FUNDAMENTALS OF CONSTRUCTION SAFETY MANAGEMENT**

T64 550C CNST

Fundamentals of the safety management process and the use of safety programs to include hazard recognition, field safety meetings/management, OSHA documentation requirements, coordination of contractor and subcontractor relationship. Students successfully completing this class will be eligible to receive an OSHA 10 hour certification.

Prerequisites: Graduate Standing, and CNST 573 or permission of instructor. 1 unit.

SECT 01: This class is being taught on three consecutive Thursday evenings- May 21, May 28, and June 4th.

01 Th 5:00p-9:00p

5/21/09 - 6/4/09

Noel, Brent

**ENGINEERING MANAGEMENT (T55)**

INDEPENDENT STUDY T55 500 TSDP

Prerequisites: Departmental approval

Credit variable, max 3 units

**TECHNICAL COMMUNICATIONS**

T55 563A ETEM

Effective written and oral communications for engineering and technology managers. Basic consideration of audience analysis, graphic aids, techniques for constructively editing your own work and that of others. Achieving clarity, precision, and brevity. Generic elements of proposals. Continuing discussion of communication ethics, imperatives, and options. Interpersonal, organizational, and regulatory factors affecting communication of technical information. Practice in oral presentation. Enrollment limited to 15 students.

3 units

01 TuTh 5:30p-8:00p

6/2/09 - 7/23/09

Ballard

**INTERNATIONAL TECHNOLOGY MANAGEMENT**

T55 574 ETEM

An understanding of the international economic and regulatory environment will be required for managing any enterprise now and into the twenty-first century. Technology development, the international macroeconomic environment, and risk factors of multinational companies are examined. Restrictions on international trade in technology developments. Selected cases are used to illustrate key influences.

Prerequisites: graduate standing or permission of instructor.

3 units

01 Sa 9:30 a.m. – 1 p.m.

5/30/09 - 8/8/09

Ciarpella

## **INFORMATION MANAGEMENT (T81)**

### **INDEPENDENT STUDY**

T81 400 TSDP

Prerequisite: Departmental approval

Credit variable, max 3 units

### **INDEPENDENT STUDY**

T81 500 TSDP

Prerequisite: Departmental approval

Credit variable, max 3 units

### **DEVELOPING LEADERSHIP FOR TECHNOLOGY**

T81 5503 TSDP

Provides knowledge about a variety of leadership approaches and how they may be effective in technological situations. The course concentrates on developing skills to actually lead in various situations. These include decision-making, problem solving, coaching, evaluating performance, selling ideas, and gaining commitment. Combines classroom, actual experiences, and reality-based feedback to hone skills resulting in a higher ability to lead.

(3 week session. Classes will be Friday 1 - 8 p.m. and Saturday 8 a.m. - 4 p.m.)

4 units

Lab, materials fee: \$100

SECT 01: Friday Classes 1-8 p.m.; Saturday classes 8 a.m. – 4p.m.

Start 6/5/09 through 6/20/09

01 Sa 8:00a-4:00p XXXIV

F 1:00p-8:00p

6/5/09 - 6/20/09 Browdy

SECT 02: Friday Classes 1-8:00 pm; Saturday classes 8-4:00 pm

Start 7/10/09 through 7/25/09

02 F 1:00p-8:00p XXXIV

Sa 8:00a-4:00p

7/10/09 - 7/25/09

Browdy

### **PROJECT MANAGEMENT FUNDAMENTALS**

T81 5504 TSDP

A practical orientation for using what is known about organizations and how to apply this knowledge to managing projects. Review of the project management paradigm, the basic ingredients of a project, critical stakeholders and roles, and the normal project life cycle will be provided. An introduction to the project management mastery model is covered along with explanations for ways to integrate current and future knowledge into the model. How project approaches should differ by how to segment the problem space - monolithic, incremental, or evolutionary.

3 units

05 TuTh 6:00p-8:30p

5/19/09 - 7/16/09

Blair

## APPLYING PROJECT MANAGEMENT

T81 5505 TSDP

The course covers the disciplines and intellectual processes that are generally accepted in the application of sound management principles to projects. The course provides an extensive review of the Project Management Institute's (PMI) Guide to Project Management Book of Knowledge (PMBOK). Included will be a detailed review of the nine knowledge areas and five process groups of the PMBOK as well as related material considered essential for a Project Management Professional PMP. The emphasis is on the common management practices and processes for all projects. This course qualifies for the training prerequisite for the PMP examination, and will include discussion of the process to prepare for and take the examination. Other frameworks will be discussed such as the capability maturity model, six sigma and ISO 9000. Simulation exercises will be provided along with a review of the mastery model for project management

3 units

SECT 01: Graduate Certificate Program Student Only. Friday class meets from 1:00pm-6:30pm and Saturday class meets 9:00AM-3:00 PM. Class dates are April 24th- May 23rd.

01 Sa 9:00a-3:00p XXXIV

F 1:00p-6:30p

Blair