School of Engineering Curriculum Committee
Annual Report 2007-2008
May 2, 2008

It has been a challenging and rewarding year for the School of Engineering Curriculum Committee (SOECC), with many initiatives begun and completed. The committee has processed a truly astounding number of change requests and – as well – made progress in resolving several school-wide policy issues.

Housecleaning

The SOECC undertook a year-long housecleaning task to delete courses that are no longer to be offered, and to revise descriptions of courses that were already present in the catalog but were never approved by the curriculum committee.

To locate courses that are no longer offered, the chair made a query to the registrar’s data warehouse to obtain a list of courses that had not been offered for five years, including the instructor who last taught the course. This list was sent to all department chairs, who responded with lists of courses to delete. In total, 49 courses were deleted from the catalog (see list below).

The second housecleaning problem is that in spring 2007, the faculty of the School of Engineering voted that all “Introductory Engineering” ½-credit courses should be approved through the curriculum committee, and that all descriptions should be revised to explicitly mention the project component of each course. As of fall 2007, when the committee first met for this year, only one course of these courses had been formally approved by the SOECC. During the year, departments decided which courses to delete, and the committee members, together with departments, worked to revise the rest of the listings and formally approve all of them.

I am thus happy to report that if all goes as planned, after the May 7 faculty meeting of the SOE, with a very small number of exceptions, all courses in the catalog will have been approved formally by the SOE, and all courses in the catalog are active and intended to be offered.

Many thanks to everyone who participated in the hard work of catalog cleanup, including department chairs, committee members, and faculty.

Pass/Fail Eliminated in Engineering Foundations

In Fall of 2007, Mechanical Engineering requested that two of the courses in its foundation (ES5 and ES8) be taken for a grade, contrary to the prior practice of allowing them to be taken pass/fail. Preliminary committee discussion of this proposal uncovered a broader desire to eliminate pass/fail in the foundations, with all but one department concurring. Department representatives reported that several courses in their foundation were regularly taken pass/fail, even though they are critical to their programs. ES56
Statistics, a foundation requirement in BSCE, BSEVE, and BSCS programs, exhibited a bimodal grade distribution, which made it difficult to provide an appropriate experience for the students not taking it pass/fail.

After extended discussion at both Committee and School meetings, three options emerged:

1. Leave the foundation pass/fail option as-is.
2. Eliminate the pass/fail option for non-elective foundations.
3. Eliminate the pass/fail option for all foundations.

In the end, the faculty of the School of Engineering voted to eliminate pass/fail for all foundations, with the friendly amendment that specific departments may allow pass/fail for specific foundation courses at their option.

Subcommittees

Near the beginning of the year, three subcommittees were established:

- Subcommittee on Statistics Requirement: to study whether we can more efficiently provide Statistics to all engineers
- Subcommittee on Numerical Analysis: to study whether there is a more efficient way to provide numerical analysis courses than we currently use.

Statistics Subcommittee

The way that Engineering students learn statistics is evolving. There are currently several options for satisfying the statistics requirement, including:

- ES56 (formerly CE102): Probability and Statistics
- EE104: Probabilistic Systems Analysis
- Math 162: Statistics (Prerequisite: Math 161: Probability)
- Biology 132: Biostatistics
- Physics 153: Statistical Mechanics

Only Computer Science allows students to take any one of these; other departments limit choices to only ES56 (BSCE, BSEVE) or ES56 and EE104 (BSEE, BSCPE).

The subcommittee on Statistics discussed two main issues:

- Whether any of these courses can be taken together for a degree.
- Whether there is any more efficient way to offer statistics.

While the first of these was difficult to determine in general, the subcommittee felt that in the particular case of ES56 and EE104, it is permissible and appropriate for both of these courses to count for credit. On the second issue, it seems that at present, ES56 still satisfies the needs of most programs, except for BSEE, BSCPE, and BSCS, all of whose needs are better met by the new EE104. There was some consensus that all Engineering programs should accept (but perhaps not encourage) Math162 for this requirement, to accommodate double-majors in Mathematics.
Numerical Analysis Subcommittee

There is an evolving need for better approaches to teaching numerical methods to Engineers. Currently, the following options exist:

- ES55: Numerical Methods for Engineers
- Math 126
- Math 128:

It was the consensus of the Subcommittee on Numerical Methods that ES55 can be made to meet the needs of most programs, except BSCS, which prefers Math126/128.

Change in request approval procedure

Due to high caseload in spring of 2008, the committee considered and passed a resolution that streamlines faculty approval of courses. Under the new scheme, change requests with impact only upon a specific department are placed into a “consent agenda” at the SOE faculty meeting. Any faculty member may request that any course be moved from the consent agenda to the regular agenda, to be discussed and voted. Requests that remain in the consent agenda at the end of each scheduled SOE faculty meeting are considered to have been “approved by unanimous consent.” This measure was taken because many requests are so non-controversial that subjecting them to a faculty vote seems to be a poor use of school faculty meeting time. This proposal was adopted by the full faculty of the School of Engineering on Mar 12, 2008.

Role of departmental representatives

Late in the year, several requests had to be sent back to departments for rewriting, and there was serious discussion of the role of committee members in the request submission process. There was consensus that the department representatives serving on the SOECC should take a more proactive role in assisting department members and chairs in creating actionable change requests. Formerly, department chairs communicated requests for action directly to the chair of the SOECC. The committee voted unanimously for a change in procedure, in which each department chair submits each request to the department’s SOECC representative, who assists in editing the request into an actionable form. This includes editing descriptions to conform to bulletin language standards. This editing assistance was formerly provided by the chair of the SOECC and – due to increased caseload – that practice is no longer practical.

Open issues and challenges

At time of this writing, there are several open issues that should be considered in future years.

First, there is concern over pass/fail policies for Introductory Engineering science electives. The current policy states that either or both of the introductory science electives can be taken pass/fail. There are two electives. The first one must be either Chemistry 2 or Physics 12, while the second one may be any course in the natural sciences that is
appropriate for credit for a science major. The concern arises because of a disparity in how individual advisors treat these courses. Some advisors encourage pass/fail for these two courses, while others prohibit it. Since these courses are a requirement for all engineering students, it would help to formulate a consistent policy that applies to all advisors and programs.

Second, there is an ongoing problem with preparing new graduate students appropriately, especially in Statistics, Numerical Analysis, and Chemistry. The recent renumbering of CE102 (Statistics) to ES56 prohibited graduate students from taking the course. This solved one problem (dual populations of students) but created another: there is now no vehicle for preparing graduate students in statistics. The situation is similar for numerical analysis. There is currently a proliferation of courses to prepare graduate students in these disciplines, and economy should be sought if at all possible.

Change requests processed

Change requests are listed in order of department of origin and course number. Starred (*) requests have been approved by the SOECC and are pending for SOE faculty approval at the May 7, 2008 SOE faculty meeting. Requests without stars have already been approved both by the SOECC and SOE. 57 requests were received concerning departmental courses and programs. Within these there were 3 program changes, 18 new courses, 19 course deletions, and 17 course revisions. In addition, 61 requests were processed for “Engineering – Introductory” (EN) courses, of which there were 31 deletions, 26 revisions, and 4 new courses. At the time of this writing, of 138 total requests, 96 have been approved by both the SOE and SOECC, and 42 have been approved by the SOECC and are awaiting faculty approval at the full SOE faculty on May 7, 2008.

Biomedical Engineering

- New*: BME 3 BIOMEDICAL ENGINEERING SOPHOMORE RESEARCH I.
- New*: BME 4 BIOMEDICAL ENGINEERING SOPHOMORE RESEARCH II.
- New*: BME 5 BIOMEDICAL ENGINEERING JUNIOR RESEARCH I.
- New*: BME 6 BIOMEDICAL ENGINEERING JUNIOR RESEARCH II.
- New*: BME 7 BIOMEDICAL ENGINEERING SENIOR RESEARCH I.
- New*: BME 8 BIOMEDICAL ENGINEERING SENIOR RESEARCH II.
- Revise*: BME101 INTRODUCTION TO BIOPHOTONICS.
- Revise*: BME116 APPLIED QUANTUM ELECTRONICS.
- Revise*: BME156 MEDICAL OPTICS LABORATORY
- New*: BME256 BIOMEDICAL OPTICS.
- New*: BME257 ADVANCED APPLIED BIOPHOTONICS.
- Program change*: Second BME Major in LA.

Chemical and Biological Engineering

- Delete CHBE0020 EQUILIBRIUM STAGED SEPARATIONS
• Delete CHBE0023 RATE-CONTROLLED SEPARATIONS.
• Rename: CHBE0060 PRODUCT AND PROCESS DESIGN.

Civil and Environmental Engineering

• Replace: CEE0010 with CEE0001 INTRODUCTION TO CIVIL AND ENVIRONMENTAL ENGINEERING
• Renumber: CEE0055 NUMERICAL METHODS FOR ENGINEERS to ES0055.
• Delete: CEE0002 CIVIL ENGINEERING MATERIALS / MEASURES.
• New*: CEE0030: ENVIRONMENTAL CHEMISTRY.
• Replace CEE0011 with CEE0032 ENVIRONMENTAL ENGINEERING PRINCIPLES.
• New*: CEE0084: ETHICS AND PROFESSIONAL PRACTICE.
• New*: CEE0120: THE ART OF BUILDING.
• Delete: CEE0127 CONCRETE: MATERIAL AND MECHANICS.
• Delete: CEE0157 ENVIRONMENTAL TOXICOLOGY.
• Delete: CEE0176 POLLUTION PREVENTION MANAGEMENT.
• Delete: CEE0181 FUZZY SETS AND GENETIC ALGORITHMS.
• Delete: CEE0184 ISSUES IN PROFESSIONAL ENGINEERING PRACTICE.
• Delete: CEE0196 SPECIAL TOPICS.
• New*: CEE0212: CHEMICAL PRINCIPLES IN ENVIRONMENTAL AND WATER RESOURCES ENGINEERING
• New*: CEE0213: TRANSPORT PRINCIPLES IN ENVIRONMENTAL AND WATER RESOURCES ENGINEERING.
• Renumbering: CEE0114 becomes CEE0214 ENVIRONMENTAL AND WATER RESOURCE SYSTEMS.
• New*: CEE0230: REACTIVE TRANSPORT IN POROUS MEDIA.
• Delete: CEE0249 PAVEMENT DESIGN.
• Program change*: BSEVE.

Computer Science

• Name change: COMP0020 WEB PROGRAMMING.
• New: COMP0093 DIRECTED STUDY.
• New: COMP0094 DIRECTED STUDY.
• Delete: COMP0099 SPECIAL TOPICS RESEARCH (duplicate).
• Delete: COMP0121 SPECIAL TOPICS (duplicate).
• Prerequisite change: COMP0131 ARTIFICIAL INTELLIGENCE.
• Delete: COMP0205 DIRECTED STUDY (duplicate).
• Delete: COMP0255 CODING THEORY AND DATA COMPRESSION TECHNIQUES.
• Program change: BSCS: Allow EE104 for statistics requirement.
Electrical and Computer Engineering

- New: EE104: PROBABILISTIC SYSTEMS ANALYSIS.
- Delete: EE0111 SELECTED TOPICS IN APPLIED OPTICS.
- Delete: EE0124 ADVANCED CUSTOM VLSI DESIGN.
- Delete: EE0153 OPTICAL ELECTRONICS LABORATORY.
- Delete: EE0155 FIBER OPTICS LABORATORY.
- New: EE249 DEVICES AND CIRCUITS FOR OPTICAL COMMUNICATIONS.
- Delete: EE0299 DOCTORAL THESIS (duplicate).

Mechanical Engineering

- Name change: ES0005 INTRODUCTION TO MECHANICS – STATICS AND DYNAMICS.
- Revise*: ME0080: SYSTEMS DYNAMICS AND CONTROLS.
- Revise: ME0145: POWER GENERATION SYSTEMS.
- Revise*: ME0180: DIGITAL CONTROL OF DYNAMIC SYSTEMS
- Revise and renumber*: ME0181: ADVANCED DYNAMICS AND VIBRATIONS.
- Revise and renumber*: ENP0163: ANALYTICAL METHODS IN HUMAN FACTORS ENGINEERING.
- Revise and renumber*: ENP0210: HUMAN FACTORS IN MEDICAL SYSTEMS.

Engineering – Introductory

- Revise*: EN 0003CHE BIOTECHNOLOGY ENGINEERING.
- Delete: EN 0004CHE SEPARATIONS: HOW TO UNMIX MIXTURES.
- Revise*: EN 0005CEE SKYSCRAPERS: ARCHITECTURE AND ENGINEERING.
- Delete: EN 0006ECE COMPUTER PROCESSING OF IMAGES.
- Delete: EN 0008ME MACHINES.
- Revise: EN 0010ME SIMPLE ROBOTICS.
- Delete: EN 0011NEW PRODUCT DESIGN.
- Delete: EN 0013ME POWER PRODUCTION.
- Revise: EN 0014ME THE WAY THINGS WORK.
- Revise: EN 0015ME USABILITY ENGINEERING.
- Revise: EN 0017ME MATERIALS, DESIGN, AND MANUFACTURING.
- Revise*: EN 0020CEE CLEAN YOUR ROOM.
- Revise*: EN 0021CEE COMPUTERS IN THE ENVIRONMENT.
- Delete: EN 0022CHE THE HYDROCARBON CENTURY.
- Revise*: EN 0023CEE BUILDING BIG--INFRASTRUCTURE ENGINEERING.
- Delete: EN 0024CEE EARTHQUAKE ENGINEERING.
• Delete: EN 0025ME LIFE IN MOVING LIQUIDS.
• Delete: EN 0026ME DESIGN AND PERFORMANCE OF MUSICAL INSTRUMENTS.
• Delete: EN 0027ME ENERGY TECHNOLOGIES.
• Delete: EN 0028ME SOUND AND SOCIETY.
• Delete: EN 0029BME BIOMEDICAL ENGINEERING PRIMER.
  o No action: EN 0031ECE EXPLORING LASER LIGHT.
• Delete: EN 0032CHE PAVING THE ROAD FOR ZERO EMISSION VEHICLES.
• Delete: EN 0033CEE ENGINEERING HEALTH: PAST SUCCESSES AND FUTURE CHALLENGES.
• Revise: EN 0034ME BIOMECHANICS AND MATERIALS IN MEDICINE.
• Revise: EN 0035ECE HISTORY OF RADIO TECHNOLOGY.
• Delete: EN 0037CEE TRANSPORTATION SYSTEMS.
• Revise*: EN 0038CEE ENVIRONMENTAL MEASUREMENTS.
• Revise*: EN 0039CEE BRIDGES: DESIGN AND CONSTRUCTION.
• Delete: EN 0040CHE PREVIEW OF CHEMICAL ENGINEERING.
• Delete: EN 0041CHE BIOENGINEERING AT THE NANOSCALE.
• Delete: EN 0042ME COMPUTATIONAL ENGINEERING.
• Revise: EN 0043ME GOURMET ENGINEERING.
• Revise*: EN 0044CHE MICROBREWERY ENGINEERING.
• Revise*: EN 0045CHE YOUR CAR--A FASCINATING COLLECTION OF FUNCTIONAL MATERIALS.
• Delete: EN 0046CEE WATER POLLUTION ON TRIAL.
• Revise*: EN 0047EXPLORING COMPUTER SCIENCE.
  o No action: EN 0048WASTE NOT, WANT NOT--THE ENGINEERING ASPECTS OF WASTE REUSE/RECYCLING.
• Delete: EN 0053 ENGINEERING PROGRAMMING USING FORTRAN 90/95.
• Delete: EN 0054 ECE DESIGNING A SOLAR ENERGY ECONOMY.
• Delete: EN 0055ME BEHIND THE SCENES.
• Delete: EN 0056CEE GEOGRAPHIC INFORMATION SYSTEMS FOR ENGINEERS.
• Delete: EN 0057CEE THE ART OF DISCOVERY.
• Delete: EN 0058ME NEW PRODUCT TESTING.
• Revise*: EN 0059CEE REALITY SIMPLIFIED: PROBLEM SOLVING USING COMPUTER SIMULATION.
• Delete: EN 0060CHE CRITICAL THINKING IN CHEMICAL PROCESS DEVELOPMENT.
• Revise: EN 0061ECE WIRELESS REVOLUTION.
• Revise: EN 0062ECE ENGINEERING ENTREPRENEURSHIP.
• Delete: EN 0063ECE EXPLORING THE WORLD OF COMPUTER ENGINEERING WITH THE PIC MICROCONTROLLER.
• Revise*: EN 0064BME INTRODUCTION TO BIOMEDICAL ENGINEERING.
• Revise*: EN 0065CHE FUEL CELL TECHNOLOGY.
• Delete: EN 0066ME PRODUCT DEVELOPMENT AND INTRODUCTION TO MANUFACTURE.
• Delete: EN 0067ECE ABOUT MAGNETS AND VISUALIZING MAGNETIC FIELDS.
• Revise*: EN 0068CEE ECOLOGY OF BUSINESS.
• Revise*: EN 0069CHBE INTRODUCTION TO CHEMICAL AND BIOLOGICAL ENGINEERING.
• Revise: EN 0070ECE MICROELECTRONICS REVOLUTION AND BEYOND.
• Delete: EN 0071ECE ENGINEERING ENTREPRENEURSHIP II.
• Delete: EN 0072CS PROGRAMMING ROBOTIC DEVICES.
  o No action: EN 0073ECE MUSIC AND THE ART OF ENGINEERING
• Revise: EN 0074ECE INTRODUCTORY IMAGE PROCESSING.
• New*: EN 0075CEE GEOHAZARDS ENGINEERING.
• New*: EN 0076CEE CLIMATE CHANGE ENGINEERING.
• New: EN0077ME COMPARATIVE BIOMECHANICS.
• New*: EN 0080CEE STRUCTURAL ART.

Respectfully submitted,
Alva L. Couch
Chair, SOECC
May 2, 2008