Dean Satish Udpa  
College of Engineering  

Re: Final report of EGR items processed on UCC  

May 18, 2010

The attached pages are an extract of agenda items processed through the University Curriculum Committee; all were approved except for some courses in the April meeting that are connected with a change in the CEE program, and are deferred until issues with the STT department are resolved. Aside from many housekeeping changes to existing courses and programs, the main items of activity were:

5 new courses were introduced, 1 course was deleted.

A change in requirements to the BS in Biosystems Engineering were submitted.

The Ph.D. in Environmental Engineering – Environmental Toxicology was discontinued.

A BS in Electrical and Computer Engineering was approved to be offered in the Dubai campus.

Minor changes in the common graduation requirements for all engineers were made.

Significant program changes were made to the Applied Engineering Arts program.

Best regards,

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c: Pam Cosner, Jamie Ramos, Tom Wolff, Rich Enbody
NEW ACADEMIC PROGRAMS AND PROGRAM CHANGES  September 17, 2009

1. Request to change the requirements for the Bachelor of Science degree in Biosystems Engineering in the Department of Biosystems and Agricultural Engineering.
   The concentrations in the Bachelor of Science degree in Biosystems Engineering will be noted on the student's academic record when the requirements for the degree have been completed.
   a. Under the heading Requirements for the Bachelor of Science Degree in Biosystems Engineering make the following changes:
      (1) In item 3. d. add the following courses:
          BE 469 Sustainable Bioenergy Systems 3
          CHE 468 Biomass Conversion Engineering 3
      (2) Under the heading Concentrations in Biosystems Engineering add the following concentration:
          Bioenergy Engineering
          To earn a Bachelor of Science degree in Biosystems Engineering with a bioenergy engineering concentration, students must complete requirements 1., 2., and 3. above and the following:
          1. All of the following courses (12 credits):
             BE 469 Sustainable Bioenergy Systems 3
             CHE 468 Biomass Conversion Engineering 3
             CSS 467 Bioenergy Feedstock Production 3
             MMG 445 Microbial Biotechnology 3
          2. One of the following courses (3 or 4 credits):
             CHE 481 Biochemical Engineering 3
             CHE 882 Advanced Biochemical Engineering 3
             CHE 883 Multidisciplinary Bioprocessing Laboratory 3
             FW 829 The Economics of Environmental Resources 3
             GLG 471 Applied Geophysics 4
             MC 450 International Environmental Law and Policy 3
             ME 417 Design of Alternative Energy Systems 3
             Effective Spring 2010

2. Request to phase out and discontinue the Doctor of Philosophy degree in Environmental Engineering-Environmental Toxicology in the Department of Civil and Environmental Engineering.
   The University Graduate Council (UGC) will consider this request at its September 14, 2009 meeting.
   No new students are to be admitted to the program effective Spring 2010. No students are to be readmitted to the program effective Spring 2010. Effective Spring 2010, coding for the program will be discontinued and the program will no longer be available in the Department of Civil and Environmental Engineering. Students who have not met the requirements for the Doctor of Philosophy degree in Environmental Engineering-Environmental Toxicology through the Department of Civil and Environmental Engineering prior to Spring 2010 will have to change their major.

PART II - NEW COURSES AND CHANGES  September 17, 2009

COLLEGE OF ENGINEERING

BE 477 Food Engineering: Fluids
Fall of every year. 3(2-2) Interdepartmental with Food Science. P: BE 350 and BE 351 P: BE 350 and BE 351 and BE 360
Unit operations, process engineering, equipment, and industrial practices of the food industry. Manufactured dairy products: thermal processing, pipeline design, heat exchange, evaporation, dehydration, aseptic processing, membrane separation, cleaning, and sanitation.
SA: FE 465
Effective Summer 2006 Effective Fall 2009

MSE 466 Design and Failure Analysis (V)
MSE 466L Spring of every year. 3(2-3) P: (MSE 250) and completion of Tier I writing requirement P: ((MSE 331 and (MSE 381 or concurrently)) or approval of department) and completion of Tier I writing requirement RB: MSE 320 and MSE 331 R: Open only to seniors in the College of Engineering. R:
Open to seniors in the College of Engineering.
Modes and causes of failure in mechanical components and role of design. Nondestructive evaluation. Legal and economic aspects of materials failure. Student projects.
SA: MSM 466
Effective Fall 2005 Effective Spring 2010

Final report for EGR issues processed in UCC 09-10 AY  2
These changes are not in the college of engineering but they do affect some Engineering students.

PART II - NEW COURSES AND CHANGES
COLLEGE OF AGRICULTURE AND NATURAL RESOURCES

FW 443 Restoration Ecology
Spring of every year. 3(2-2) Interdepartmental with Biosystems Engineering and Zoology. RB: (CSS 210 or BE 230) and (FOR 404 or FW 364 or ZOL 355)
Principles of ecological restoration of disturbed or damaged ecosystems. Design, implementation, and presentation of restoration plans. Principles of ecological restoration of disturbed or damaged ecosystems. Design, implementation, and presentation of restoration plans. Field trips required.
Effective Fall 1999 Effective Spring 2009

FW 852 Systems Modeling and Simulation
Fall of even years. 3(3-0) Interdepartmental with Biosystems Engineering and Forestry and Resource Development. Interdepartmental with Biosystems Engineering and Forestry RB: STT 422 or STT 442 or STT 464 or GEO 463
General systems theory and concepts. Modeling and simulation methods. Applications of systems approach and techniques to natural resource management, and to ecological and agricultural research.
Effective Fall 1996 Effective Summer 2010
PART I – NEW ACADEMIC PROGRAMS AND PROGRAM CHANGES

COLLEGE OF ENGINEERING

1. Request to establish a Bachelor of Science degree in Electrical and Computer Engineering in the Department of Electrical and Computer Engineering. The University Committee on Academic Policy (UCAP) will consider this request at its November 19 meeting.

a. Background Information:
With two years experience of offering engineering in Dubai, it has become apparent to the College of Engineering and faculty at the Dubai instructional site that including an electrical engineering component will enhance the marketability of the program and better serve regional demands. A program that offers components of both electrical and computer engineering will provide a more focused solution, both for students and future graduates in pursuit of their careers.

b. Academic Programs Catalog Text:
The Bachelor of Science degree in Electrical and Computer Engineering is offered only at the Dubai instructional site. The program is designed to provide students with an opportunity to study electrical engineering and computer engineering including exploration of both hardware and software.

Requirements for the Bachelor of Science Degree in Electrical and Computer Engineering

1. The University requirements for bachelor’s degrees as described in the Undergraduate Education section of this catalog: 128 credits, including general elective credits, are required for the Bachelor of Science degree in Electrical and Computer Engineering. The University’s Tier II writing requirement for the Electrical and Computer Engineering major is met by completing Electrical and Computer Engineering 460. That course is referenced in item 3. b. below.

Students who are enrolled in the College of Engineering may complete the alternative track to Integrative Studies in Biological and Physical Sciences that is described in item 1. under the heading Graduation Requirements for All Majors in the College statement. Certain courses referenced in requirement 3. below may be used to satisfy the alternative track.

2. The requirements of the College of Engineering for the Bachelor of Science degree.
The credits earned in certain courses referenced in requirement 3. below may be counted toward College requirements as appropriate.

3. The following requirements for the major:

CREDITS

a. One of the following courses (1 credit):
   CEM 161 Chemistry Laboratory I
   PHY 191 Physics Laboratory for Scientists I
b. All of the following courses (43 credits):
   CSE 232 Introduction to Programming II
   CSE 260 Discrete Structures in Computer Science
   CSE 331 Algorithms and Data Structures
   ECE 201 Circuits and Systems I
   ECE 262 Circuits and Systems II
   ECE 203 Circuits and Systems Laboratory
   ECE 230 Digital Logic Fundamentals
   ECE 280 Electrical Engineering Analysis
   ECE 302 Electronic Circuits
   ECE 303 Electronics Laboratory
   ECE 313 Control Systems
   ECE 331 Microprocessors and Digital Systems
   ECE 368 Introduction to Signal Processing
   ECE 390 Ethics, Professionalism and Contemporary Issues

PART I - NEW ACADEMIC PROGRAMS AND PROGRAM CHANGES – continued - 2

ECE 480 Senior Design

c. Complete a minimum of 21 credits from the following courses.
Specific courses offered at the Dubai instructional site can be expected to be a subset of this list during an individual student’s degree pursuit.

(1) At least one of the following laboratory courses:
   ECE 402 Applications of Analog Integrated
Circuits 4
ECE 404 Radio Frequency Electronic
Circuits 4
ECE 410 VLSI Design 4
ECE 411 Electronic Design Automation 4
ECE 412 Introduction to Mixed-Signal
Integrated Circuits 4
ECE 416 Digital Control 3
ECE 458 Communication Systems
Laboratory 1
(2) At least one of the following courses:
CSE 335 Object-oriented Software Design 3
CSE 410 Operating Systems 3
CSE 420 Computer Architecture 3
CSE 450 Translation of Programming
Languages 3
CSE 471 Media Processing and Multimedia
Computing 3
(3) At least one of the following courses:
ECE 305 Electromagnetic Fields and
Waves I 4
ECE 320 Energy Conversion and Power
Electronics 3
ECE 423 Power System Analysis 3
ECE 442 Introduction to Communication
Networks 3
ECE 457 Communication Systems 3
ECE 466 Digital Signal Processing and
Filter Design 3
ECE 474 Principles of Electronic Devices 3
Students may use registered 'out of classroom' experiences to substitute for
credits in this requirement. Students who complete a total of three experiences
documented by pre-approved Engineering 393 or Electrical and Computer
Engineering 490 or 499 credits, may reduce this requirement to 18 credits. All
substitutions must be approved by the student's academic advisor.
Effective Fall 2010.

November 12, 2009
PART II - NEW COURSES AND CHANGES
COLLEGE OF ENGINEERING

CE 480 Environmental Measurements Laboratory
Fall of every year. 1(0-3) Interdepartmental with Environmental Engineering. P: CEM 161 or CEM
185H or LB 171L
Basic chemical and microbiological methods used in the analysis of environmental media.
Laboratory safety, quality assurance, quality control, and statistics used in laboratory
analysis. Related technical communication, laboratory report writing.
Effective Fall 2010

CE 806 Advanced Structural Concrete Design
Fall of every year. Spring of even years. 3(3-0)
Analysis and design of prestressed and conventionally reinforced concrete structures.
SA: CE 808
Effective Fall 2001 Effective Spring 2010

CE 822 Groundwater Modeling
Spring of even years. 3(3-0) Interdepartmental with Environmental Engineering. P: CE 821
Analysis and modeling of groundwater flow, surface water and groundwater interaction,
and reactive contaminant transport. Applied numerical methods for solving groundwater
flow and contaminant transport equations. Case studies.
Effective Spring 2010
CE 836 Materials Science for Civil Engineers
Fall of every year. Spring of every year. 3(3-0) RB: (CE 337) or equivalent
Structure of materials and structure-property relationships. Principles and theories
governing mechanical, physical, and durability characteristics of civil engineering
materials. Material selection, production, and quality control.
Effective Summer 2006 Effective Fall 2010

CE 837 Advanced Concrete Materials
Fall of odd years. Spring of odd years. 3(3-0)
Microstructure, engineering characteristics and modeling of concrete materials. Structure-property
relationships in concrete materials. Control of concrete structure and properties
for different infrastructure applications.
Effective Summer 2007 Effective Spring 2011

ECE 867 Information Theory and Coding
Fall of odd years. Spring of every year. 3(3-0) P: ECE 863
Shannon information measures. Uniqueness theorem and chain rules of the entropy
measures. Kullback-Leibler relative-entropy. The I-measure. Asymptotic Equipartition
Property (AEP) for various sources. Channel capacity; discrete-memoryless and
symmetric channels. The channel coding theorem. Rate-distortion theory. Applications of
coding to modern communications and compression methods such as image
Effective Spring 2004 Effective Fall 2009

ME 451 Control Systems
Fall of every year. Spring of every year. 4(3-3) P: (ME 361 and ECE 345) and completion of Tier I
writing requirement. P: ME 461 and ECE 345 R: Open only to juniors or seniors in the Mechanical
Engineering major. R: Open to juniors or seniors in the Mechanical Engineering major.
Mathematical modeling of dynamic systems. Standard feedback control formulation.
Transient and sinusoidal steady state analysis. Time and frequency domain controller
synthesis.
Effective Fall 2005 Effective Summer 2010

ME 461 Mechanical Vibrations
Fall of every year. Spring of every year. 4(3-3) P: (ME 451) and completion of Tier I writing
requirement. P: ME 361 and ME 391 R: Open only to juniors or seniors in the Mechanical
Engineering major. R: Open to juniors or seniors in the Mechanical Engineering major.
Modeling and analysis of oscillatory phenomena found in linear discrete and continuous
mechanical systems.
Effective Fall 2005 Effective Summer 2010
PART II - NEW COURSES AND CHANGES February 18, 2010
COLLEGE OF AGRICULTURE AND NATURAL RESOURCES

FW 853 Applied Systems Modeling and Simulation for Natural Resource Management
Spring of odd years. 3(2-2) Interdepartmental with Biosystems Engineering and Forestry and Resource Development and Zoology. Interdepartmental with Biosystems Engineering and Forestry and Zoology RB: (FW 820 or BE 486 or ZOL 851) or or approval of department. R: Open to seniors and graduate students. R: Open to seniors or graduate students.
Effective Spring 1997 Effective Fall 2010

COLLEGE OF ENGINEERING

MSE 310 Phase Equilibria in Materials
Fall of every year. 3(3-0) P: (MSE 250 or concurrently) and (MTH 234 or MTH 254H or LBS 220) P:
((MSE 250 or concurrently) and (MSE 331 or concurrently)) and (MTH 234 or MTH 254H or LB 220) R: Open only to juniors or seniors in the College of Engineering. R: Open to juniors or seniors in the College of Engineering.
Enthalpy. Entropy. Free energy. Phase changes in metal, ceramic, and polymer materials systems. Application to alloying, phase diagram determination, and electrochemistry.
SA: MSE 351
Effective Fall 2004 Effective Fall 2010

MSE 331 Materials Characterization Methods I
Fall of every year. 1(0-3) P: (MSE 310 or concurrently) and (MSE 320 or concurrently) P: MSE 310 or concurrently R: Open only to juniors or seniors in the Materials Science and Engineering major.
R: Open to juniors or seniors in the Materials Science and Engineering major.
Thermal analysis. Optical and Scanning Electron Microscopy Laboratory for characterizing microstructure-property relationships. Effects of processing on microstructures, properties, and fracture surfaces in metal, ceramic and polymer systems.
SA: MSE 375
Effective Fall 2004 Effective Fall 2010

MSE 466 Design and Failure Analysis (W)
Spring of every year. 3(2-3) P: ((MSE 331 and (MSE 381 or concurrently)) or approval of department) and completion of Tier I writing requirement P: ((MSE 331 and (MSE 381 or concurrently) and MSE 320) or approval of department) and completion of Tier I writing requirement R: Open to seniors in the College of Engineering.
Modes and causes of failure in mechanical components and role of design. Nondestructive evaluation. Legal and economic aspects of materials failure. Student projects.
SA: MSM 466
Effective Spring 2010 Effective Fall 2010

ECE 868 Signal Compression
Fall of even years. 3(3-0) RB: Probability Theory
Entropy coding. Huffman and arithmetic entropy coding. Rate distortion theory.
Communication channel models for compressed signals.
Effective Fall 2010

ECE 924 Power Electronic Systems for Renewable Energy, Transportation, and Utility Applications
Spring of even years. 3(3-0) P: ECE 821
Effective Fall 2010
PART II - NEW COURSES AND CHANGES March 25, 2010

COLLEGE OF ENGINEERING
ENE 489 Air Pollution: Science and Engineering
Spring of every year. 3(3-0) Interdepartmental with Civil Engineering. P: MTH 133 and (CEM 141 or CEM 151) and CE 280
NEW Basic physical and chemical principles governing indoor and atmospheric air pollution. Elements of air pollution meteorology, climate change, atmospheric transformations and transport. Air pollution sources and methods for their control. The role of local, state and federal government in air pollution control.
Effective Fall 2010

ENE 806 Laboratory Feasibility Studies for Environmental Remediation
Environmental Engineering Process Laboratory
Spring of every year. 3(2-4) P: CE 480 and ENE 802 and ENE 804 RB: ENE 802 and ENE 804 R:
Open only to graduate students in the Environmental Engineering major or Environmental Engineering-Environmental Toxicology major. R: Open to graduate students in the Environmental Engineering major. Not open to students with credit in ENE 803 or ENE 805. Not open to students with credit in ENE 802 or ENE 804.
Analysis and characterization of contaminants in soil or water. Conceptual and preliminary design of treatment systems. Use of treatability studies to evaluate treatment options. Oral presentations and preparation of consulting reports with design recommendations. This course is designed to develop skills related to planning, design, and execution of processes related to environmental engineering, enhance decision making skills, teamwork, analysis of data, report writing, and oral presentation.
Effective Spring 1997 Effective Summer 2011
COLLEGE OF ENGINEERING
1. Request to change the Graduation Requirements for All Majors in the College of Engineering.
   a. Under the heading Graduation Requirements for All Majors make the following changes:
      (1) In item 1., replace paragraph one with the following:
      The University requirements for bachelor’s degrees as described in the Undergraduate Education section of the catalog; 120 credits, including general elective credits, are required for the Bachelor of Science degree in Computer Science and the Bachelor of Science degree in Applied Engineering Sciences; and 128 credits, including general elective credits, are required for the Bachelor of Science degree in the other Engineering majors.
      (2) In item 2. a. replace the second sentence with the following:
      Computer Science, and Applied Engineering Sciences majors are not required to complete Mathematics 235.
      (3) Replace item 2. d. with the following:
      Engineering 102. Computer Science, Computer Engineering, and Electrical and Computer Engineering majors are not required to complete Engineering 102.
      Effective Fall 2010.
   PART I - NEW ACADEMIC PROGRAMS AND PROGRAM CHANGES – continued - 4 April 20, 2010

2. Request to change the requirements for the Bachelor of Science degree in Applied Engineering Sciences in the College of Engineering. The University Committee on Academic Policy (UCAP) will consider this request.
   The concentrations in the Bachelor of Science degree in Applied Engineering Sciences will be noted on the student’s academic record when the requirements for the degree have been completed.
   a. Under the heading Requirements for the Bachelor of Science Degree in Applied Engineering Sciences make the following changes:
      (1) In item 1. make the following changes:
      (a) In paragraph one, change “128’ to ‘120’.
      (b) Change paragraph two to the following:
      The University’s Tier II writing requirement for the Applied Engineering Sciences major is met by completing Engineering 410. This course is referenced in item 3.
      a. below.
      (2) Replace item 3. with the following:
      The following requirements for the major:
      a. All of the following courses (46 credits):
      ACC 230 Survey of Accounting Concepts 3
      CE 211 Statics 3
      CEM 161 Chemistry Laboratory I 1
      COM 225 Introduction to Interpersonal Communication 3
      EC 201 Introduction to Microeconomics 3
      EC 202 Introduction to Macroeconomics 3
      ECE 201 Circuits and Systems I 3
      EGR 210 Global Systems: Economics, Engineering, Environment 3
      EGR 310 Sustainable Systems Analysis 3
      EGR 410 System Methodology 3
      ME 201 Thermodynamics 3
      ME 280 Graphic Communications 2
      MGT 325 Management Skills and Processes 3
      MKT 317 Quantitative Business Research Methods 3
      MSE 250 Materials Science and Engineering 3
      PHY 191 Physics Laboratory for Scientists, I 1
      STT 315 Introduction to Probability and Statistics for Business 3
      b. One of the following courses (3 credits):
      BE 230 Engineering Analysis of Biological Systems 3
      CE 280 Principles of Environmental Engineering and Science 3
      c. Concentration (15 to 18 credits):
In consultation with their academic advisor, students must select one of the following concentrations: computer science, supply chain management, technical sales, or telecommunications. For students interested in computer science, the minimum criteria for acceptance is the completion of Computer Science and Engineering 231 and 260 with a combined grade-point average in those two courses of 3.0. The concentration will be noted on the student's academic record.

**Computer Science** (18 credits)
1. All of the following courses (12 credits):
   - CSE 231 Introduction to Programming I
   - CSE 232 Introduction to Programming II
   - CSE 260 Discrete Structures in Computer Science
2. One of the following courses (3 credits):
   - CSE 320 Computer Organization and Architecture

**PART I - NEW ACADEMIC PROGRAMS AND PROGRAM CHANGES – continued - 5**

**April 20, 2010**

- CSE 331 Algorithms and Data Structures
- CSE 335 Object-oriented Software Design
3. One of the following courses (3 credits):
   - CSE 410 Operating Systems
   - CSE 420 Computer Architecture
   - CSE 440 Introduction to Artificial Intelligence
   - CSE 471 Media Processing and Multimedia Computing
   - CSE 472 Computer Graphics

**Supply Chain Management** (15 credits)
All of the following courses:
- FI 320 Introduction to Finance
- MKT 327 Introduction to Marketing
- SCM 303 Introduction to Supply Chain Management
- SCM 371 Procurement and Supply Management
- SCM 372 Manufacturing Planning and Control

**Technical Sales** (18 credits)
All of the following courses:
- COM 360 Advanced Sales Communication
- COM 483 Practicum in Sales Communication
- FI 320 Introduction to Finance
- MKT 313 Personal Selling and Buying Processes
- MKT 327 Introduction to Marketing
- MKT 383 Sales Management
- SCM 474 Negotiations

**Telecommunications** (18 credits)
All of the following courses:
- TC 100 The Information Society
- TC 201 Introduction to Media and Communication Technology
- TC 210 Media and Communication Policy
- TC 300 Economics of Media
- TC 361 Information and Communication Technology Management
- TC 365 Introduction to Network Management

Effective Fall 2010

**PART II - NEW COURSES AND CHANGES April 20, 2010**

**COLLEGE OF ENGINEERING**
EGR 210 Global Systems: economics, engineering, environment
Fall of every year. 3(3-0) P: EGR 102 or CSE 231 R: Not open to freshmen.
NEW Globalization as a process driven by economics, enabled by engineering, and constrained
by the environment. Development of systems analysis tools for understanding how these themes interact globally. Enhancement of communication skills through teaming, presentations, and active listening.

Effective Fall 2010

EGR 300 Technology, Society and Public Policy
Fall of every year. 2(2-0) P: Completion of Tier I writing requirement. RB: Two courses in mathematics or engineering or science.
SA: EGR 200, MSM 300
DELETE COURSE
Effective Summer 2010

EGR 310 Sustainable Systems Analysis
Spring of every year. 3(2-3) P: EGR 210 and (STT 315 or concurrently) RB: (EGR 210) and completion of Tier I Writing requirement R: Open to juniors or seniors in the College of Engineering or approval of department.
NEW Concepts of sustainable systems; computational analysis tools for project management, life-cycle analysis, system-level representation, and six-sigma approaches. Case studies. Modeling and computational analysis.
SA: EGR 300
Effective Fall 2010

EGR 410 System Methodology
Spring of every year. 2(1-3) 3(1-4) P: (EGR 300 and STT 351) and ((ECE 201 or concurrently) or (ECE 230 or concurrently) or (ECE 345 or concurrently)) and ((ME 222 or concurrently) and completion of Tier I writing requirement) P: (EGR 310) and completion of Tier I writing requirement RB: Substantial completion of the Applied Engineering Sciences (AES) engineering core courses, and the AES specialization core courses R: Open to students in the Applied Engineering Sciences major. R: Open to seniors in the Applied Engineering Sciences major. Approval of department; application required.
System analysis and design. Needs analysis, system identification, and graphical models. Team project required. System analysis experience involving analysis tools and practices appropriate to the project, oral and written communication, professional ethics.
SA: MSM 400, SYS 410
Effective Spring 2007 Effective Summer 2011

A number of CEE courses were on the agenda, but tabled, as they are linked to a program change that has been delayed due to unresolved issues with the STT department.