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The Faculty Senate of Liberty University

Moderator	Moderator Elect	Secretary	Past Moderator	Exec. Comm. At Large	Chaplain	Parliamentarian
Ed Barker	*Don Love*	*Gabriel Etzel*	*Ben Gutierrez*	*Dan Henrich* *Ed Martin*	*Dave Beck*	*Clay Peters*

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Senate Agenda
Thursday, October 26, 2006, 3:20, DH 1104

Call to Order – *E. Barker*

Invocation – *D. Beck*

Administrative Comments – *B. Rist*

Presentation of Minutes – *G. Etzel*

Reports – For Information Only

UBS Financial Services representatives will be presenting to the Faculty Senate on November 3, 2006 in the Reber-Thomas Executive Dining Room from 10:00-11:00AM. UBS will be addressing the possibility of a change to Liberty University's current retirement benefits. This meeting is only for the members of the Faculty Senate.

Old Business

SB 1902 *(Undergraduate Curriculum Committee)*
Proposal to Change in Requirements for Theatre Arts Minor

Present requirements:

THEA 200, Play Production I - 2 semesters *2 hours total*
THEA 211 or THEA 212, Foundations of Theatre History & Performance 1 or 2 *3 hours*
THEA 220, Basic Acting *3 hours*

One class from the following:
THEA 320, Directing *3 hours*
THEA 350, Playwriting *3 hours*
THEA 410, Drama in the Church *3 hours*

One class from the following:
THEA 420, Advanced Acting *3 hours*
THEA 422, Classical/Shakespearian Performance *3 hours*
THEA 450, Musical Theatre Performance *3 hours*

One class from the following:
THEA 495, Directed Research in Theatre *3 hours*
THEA 497, Special Topics in Theatre *3 hours*
THEA 499, Theater Internship *3 hours*

The proposal is to delete the final set of options from the minor and add as a requirement for the minor:
THEA 310, Basic Acting II *3 hours*

(2nd Read)

SB 1903 (*Undergraduate Curriculum Committee*)
Proposal for a Change of Course number from NURS 475 to NURS 225

NURS 225 *Research in Nursing*

This course provides a comprehensive overview of the research process including methodology, design and interpretation of findings. It focuses on the acquiring of knowledge and skills essential for the critical evaluation of research reports and the needs of the research consumer.

Prerequisite: NURS 210, 215 and MATH 201

(2nd Read)

SB 1904 (*Undergraduate Curriculum Committee*)
Proposal to Change Major Requirements in B.S. Social Sciences

Current Requirements:

History Requirements (6 hours)
HIUS 221 or 222, Survey of American History I or II *3 hours*
HIST 470, Comparative Civilization *3 hours*
ELECTIVES (22 hours)

Requested Change in Requirements:

History Requirements (9 hours)
HIUS 221 or 222, Survey of American History I or II *3 hours*
HIST 470, Comparative Civilization *3 hours*
HIST 419, Secondary Social Studies Teaching Methods, *2 hours*
HIST 420, Secondary Teaching Methods Practicum, *1 hour*
ELECTIVES (19 hours)

(2nd Read)

SB 1905 (*Undergraduate Curriculum Committee*)
Proposal for New English Course

ENGL 410, Classical Epic *3 hours*
Description: A study of *The Iliad* and *The Odyssey* of Homer and *The Aeneid* of Virgil.

Prerequisites:
ENGL 101, 102 and the general education course in literature.

(2nd Read)

SB 1906 (*Undergraduate Curriculum Committee*)
Proposal for New English Course

ENGL 347, Southern Renascence *3 hours*
Description: This course will be a study of the works of the period of American Literature which has been labeled the Southern Renascence, covering Southern writers from the mid 1920s through the early 1960s.

Prerequisites:
ENGL 101, 102 and the general education course in literature.

(2nd Read)

SB 1907 (*Undergraduate Curriculum Committee*)
Proposal for New English Course

ENGL 344 American Modernism *3 hours*
Description: This course will focus on American literature during the period between the World Wars (1914-1945) with a special emphasis on the Modernism movement.

Prerequisites:
ENGL 101, 102 and the general education course in literature.

(2nd Read)

SB 1908 (*Undergraduate Curriculum Committee*)
Proposal for change in major requirements: B.A. English

Present requirements:
Students are required to take either:
ENGL 322 Shakespeare or
ENGL 403 Milton or
ENGL 452 Chaucer

ENGL 322, Shakespeare and another major author class (ENGL 403, ENGL 452 or a Special Topics author course) will be required.

(2nd Read)

New Business

SB 1910 (*Undergraduate Curriculum Committee*)
Proposal for new course: MLAN 280, Field Language Learning

MLAN 280, Field Language Learning 3 hrs
Prerequisite: none

A course for learning how to learn a foreign language without a teacher; especially designed for international workers.

(1st Read)

SB 1911 (*Undergraduate Curriculum Committee*)
Proposal for a new course and a change in program requirements: TESOL.

MLAN 300, Introduction to Cultural Anthropology 3 hrs
Prerequisite: none

A course designed to heighten awareness and understanding of our culturally diverse world, via the study of systems of human behavior for the purpose of improving understanding of, and relations between, people. Several case studies will be used to illustrate these systems.

This course will replace SOCI 340 on the Status Sheet as a requirement.

(1st Read)

SB 1912 (*Undergraduate Curriculum Committee*)
Proposal for a new course: PSYC 318, Consumer Psychology

Prerequisites: PSYC 101

Consumer Psychology is the study of individuals, groups, or organizations and the processes they use to select, secure, use, and dispose of products, services, experiences, or ideas to satisfy the wants and needs of the consumer and society.

SB 1913 (*Undergraduate Curriculum Committee*)
Proposal for a new elective course: PSYC 475, Psychology of Criminal Behavior

PSYC 475 Psychology of Criminal Behavior 3 hours

Prerequisites: For PSYC majors; PSYC 101 or 210 or SOC 200, and PSYC 341, and PSYC 430. For CJUS majors; PSYC 101 or 210 or SOC 200, and CJUS 340.
The focus of this course will be on understanding the psychological causation of criminal behavior. The course will address a variety of theoretical and practical aspects of the causes and the effects of aggression and crime on individuals and society. Biological,

developmental, psychological, educational, situational and spiritual factors will be examined, as will the nature of and underlying reasons for various types of crimes, including but not limited to homicide, family violence, sexual offenses, victimology and terrorism.

(1st Read)

SB 1914 (*Undergraduate Curriculum Committee*)
Proposal for new major: BS in Pastoral Leadership

Upon approval of this major, the BS in Religion/Pastoral Leadership Specialization will be deleted from the Catalog.

CURRENT BS in Religion Requirements:
Religion Major CORE: (24 hours)

Course	hrs.
BIBL 324	3
BIBL 350	3
BIBL 425	3
CCST 461	3
CHHI 301/302	3
THEO 250	3
CHMN 201	3
YOUT 447	3

Specialization – Pastoral Leadership: (24-27 hours)

GREK 301	3
GREK 302	3
PLED 350	3
PLED 421	3
PLED 422	3
PLED 450	3
PLED 499	3-6
BIBL 424 or THEO 412	3

PROPOSED BS in Pastoral Leadership:
MAJOR: Pastoral Leadership (51-54 hours)

Course	hrs.
BIBL 324	3
BIBL 350	3
BIBL 424 or THEO 412	3
BIBL 425	3
CCST 461	3
CHHI 301/302	3
CHMN 201	3
GREK 301	3
GREK 302	3
PLED 350	3
PLED 421	3
PLED 422	3
PLED 450	3
PLED 499	3-6
PLED/BIBL or GREK _____	3
THEO 250	3
YOUT 447	3

(1st Read)

SB 1915 (*Undergraduate Curriculum Committee*)
Proposal for new major: BS in Women's Ministries

Upon approval of this major, the BS in Religion/Women's Ministries Specialization will be deleted from the Catalog.

FOR WOMEN ONLY

CURRENT BS in Religion Requirements:
Religion Major CORE: (24 hours)

Course	hrs.
BIBL 324	3
BIBL 350	3
BIBL 425	3
CCST 461	3
CHHI 301/302	3
THEO 250	3
CHMN 201	3
YOUT 447	3

Specialization – Women's Ministries: (18 hours)

CHMN 220	3
CHMN 320	3
CHMN 330	3
CHMN 387	3
CHMN 403	3
FACS 350, 370 Or PSYC 361	3

PROPOSED BS in Women's Ministries:
MAJOR: Women's Ministries (51-54 hours)

Course	hrs.
BIBL 324	3
BIBL 350	3
BIBL 425	3
BIBL/CHMN/ THEO/ GREK	6
CCST 483	3
CHHI 301 or 302	3
CHMN 201	3
CHMN 220	3
CHMN 320	3
CHMN 330	3
CHMN 387	3
CHMN 403	3
CHMN 499	3-6
FACS 350, 370 or PSYC 361	3
THEO 250	3
YOUT 447	3

(1st Read)

SB 1916 (*Undergraduate Curriculum Committee*)
Proposal for New General Engineering Courses

ENGR 110 Introduction to Engineering and Problem Solving

ENGR 110 Introduction to Engineering and Problem Solving 3 credit hours

Prerequisite: MATH 121 or MATH 128 (may be taken concurrently)
Introduction to discipline of Engineering and the use of programming languages to solve engineering problems.

ENGR 102 Technical Writing for Engineers

ENGR 102 Technical Writing for Engineers 3 credit hours

Prerequisite: ENGL 100
Research-based, project-focused course designed to address the writing needs of engineering students. Projects will focus on professional communication that engineers will likely encounter in their careers.

ENGR 210 Probability and Statistical Methods for Engineering

ENGR 210 Probability and Statistical Methods for Engineering 3 credit hours

Prerequisite: (ENGR 110 or CSCI 110) and MATH 132
Introduction to applied probability and the principles and methodologies of statistical inference. Topics include methods of data analysis, point and interval estimation; test of hypotheses, correlation, regression and an introduction to analysis of variance methods.

ENGR 370 Quality Assurance

ENGR 370 Quality Assurance 3 credit hours

Prerequisite: ENGR 210
A concentrated study of the principles involved in designing statistical quality control systems. Topics include probability concepts, density and distribution functions, control chart concepts and sampling inspection plans.

ENGR 377 Engineering Ethical & Legal Issues

ENGR 377 Engineering Ethical & Legal Issues 3 credit hours

Prerequisite: Junior or Senior standing
A survey from a Christian perspective of the ethical & legal issues encountered during the development of engineering projects. Topics include copyrights, patents, contracts, environmental responsibility, personnel management, and professionalism.

ENGR 381 Engineering Design Introduction

ENGR 381 Engineering Design Introduction 3 credit hours

Prerequisite: Junior Status and MATH 334
The first of a three-course sequence providing a detailed investigation of the design process. Topics include system engineering, team dynamics, design specifications, conceptual design, scheduling, developing a business plan, market survey, and budgeting.

(1st Read)

SB 1917 *(Undergraduate Curriculum Committee)*
Proposal for New Major: BS in Electrical Engineering (B.S.) (ENGE)

General Education Requirements	**53 hours**
Foundational Studies (17 hours)	
ENGR 102 Technical Writing for Engineers	3 hrs
ENGL 102	3 hrs
COMS 101	3 hrs
MATH 131	4 hrs
EVAN 101	2 hrs
GNED 101	1 hr
GNED 102	1 hr

Investigative Studies (36 hours)

ENGL 201, 202, 215, 216, 221, or 222	3 hrs
PHYS 231	4 hrs
PHYS 232	4 hrs
HISTORY	3 hrs
SOC SCI	3 hrs
HUMN 101	3 hrs
MATH 132	4 hrs
THEO 201	3 hrs
THEO 202	3 hrs
BIBL 105 or 205	3 hrs
BIBL 110 or 210	3 hrs

Other Requirements **26-27 hours**

Quantitative Studies – (12 hours)

ENGR 210 Probability and Statistical Methods for Engineering	3 hrs
MATH 231	3 hrs
MATH 321	3 hrs
MATH 334	3 hrs

Graduation Requirements (2-3 hours)

CRST 290	2 hrs
FRSM 101 -	0-1 hrs

Technical Electives – (12 hours minimum from list of approved Engineering Courses)

_____ ____	_ hrs
_____ ____	_ hrs
_____ ____	_ hrs
_____ ____	_ hrs

Electrical Engineering Major Requirements **53 hours**

Required (50 hours)

CSCI 111 Computer Science I	3 hrs
ENGR 110 Introduction to Engineering and Problem Solving	3 hrs
ENGR 381 Engineering Design Introduction	3 hrs
ENGE 201 Introduction to Logic Design	3 hrs
ENGE 211 Introduction to Electrical Circuits	4 hrs
ENGE 212 AC Circuit Analysis	4 hrs
ENGE 311 Signals and Systems	3 hrs
ENGE 321 Electronics	4 hrs
ENGE 331 Electromagnetic Fields	4 hrs
ENGE 341 Communications Systems	3 hrs
ENGE 351 Power Systems	3 hrs
ENGE 361 Computer Architecture	3 hrs
ENGE 421 Advanced Electronics	3 hrs
ENGE 481 Electrical Engineering Design I	3 hrs
ENGE 482 Electrical Engineering Design II	3 hrs
ENGE 495 Directed Research	1-6 hrs

Choose one of the following – (3 hours)

ENGE 431 Electromagnetic Compatibility	3 hrs
ENGE 465 Introduction to Computer Networks	3 hrs

Note: CSCI 111 is an existing course.

New Courses

ENGE 201 Introduction to Logic Design **3 credit hours**

Prerequisite: MATH 121 or MATH 128 (may be taken concurrently)

Introduction to combinational logic design, Boolean algebra, logic minimization, and Karnaugh maps with an emphasis on applying topics presented to design of registers, counters and finite state machines using CPLD's.

ENGE 211 Introduction to Electrical Circuits **4 credit hours**

Prerequisite: ENGR 110 and MATH 131
Introduction to circuit elements. Topics include resistors, independent sources, capacitors, inductors, equivalent networks, and an introduction to basic techniques used in DC circuit analysis. Laboratory exercises will focus on building, measuring and calculating the response of DC circuits and transient analysis of R, L, and C components.
Text: *Fundamentals of Electric Circuits*, Alexander and Sadiku

ENGE 212 AC Circuit Analysis **4 credit hours**
Prerequisite: ENGE 211 and MATH 132
Introduction to AC analysis and phasors and the application of techniques from ENGE 211 to AC circuits. Topics include analysis of AC steady state circuits, magnetically coupled circuits, power, equivalent circuits, controlled sources and advanced circuit analysis.

ENGE 311 Signals and Systems **3 credit hours**
Prerequisite: ENGE 212 and MATH 321 (MATH 321 can be concurrent)
Analysis techniques for system and signal modeling using numerical analysis software. Topics include introduction to convolution, Fourier series, Fourier transforms, LaPlace transforms with application to determine system response, filters, sampling, linearity, time invariance and stability.

ENGE 321 Electronics **4 credit hours**
Prerequisite: ENGE 212
Introduction to electronic devices including diodes, transistors and operational amplifiers and their applications in electrical circuits.

ENGE 331 Electromagnetic Fields **4 credit hours**
Prerequisite: ENGE 212 and MATH 334
Fundamentals of electromagnetic theory and modern transmission systems. Maxwell's equations are formulated and applied to electromagnetic problems including plane-wave propagation, reflection and transmission at discontinuous boundaries and basic transmission line theory.

ENGE 341 Communications Systems **3 credit hours**
Prerequisite: ENGE 321 and MATH 211 and MATH 231
Analysis and design of communication systems and transmission of information over various medium. Topics include modulation, sampled signals, conversion (ADC and DAC), random processes and noise.

ENGE 351 Power Systems **3 credit hours**
Prerequisite: ENGE 321
Basic concepts of AC systems. Topics include single-phase and three-phase networks, electric power generation, transformers, transmission lines, electric machinery and the use of power.

ENGE 361 Computer Architecture **3 credit hours**
Prerequisite: ENGE 321 and ENGE 201 and CSCI 111
An overview of the architecture and organization of computer systems. Topics include data and instruction representation, arithmetic and logical operations, processor and memory implementations, memory hierarchy (cache, main memory and secondary memory), simple pipelines and hardware applications of OS functions.

ENGE 421 Advanced Electronics **3 credit hours**
Prerequisite: ENGE 321
Application of advanced design methods used to achieve gain and bandwidth specifications in amplifiers. Topics include use of feedback techniques, and design specifications of operational amplifiers.

ENGE 431 Electromagnetic Compatibility **3 credit hours**
Prerequisite: ENGE 331
The study of Electromagnetic fields of passive components and Electromagnetic compatibility regulations and measurements. Topics include radiated signals, electromagnetic waves, transmission lines, conducted emissions, radiated emissions, electromagnetic shielding and grounding, and Electrostatic discharge. (Elective)

ENGE 465 Introduction to Computer Networks **3 credit hours**
Prerequisite: ENGE 341
Emphasis is placed on network transport services and key protocols to include TCP, IP, and UDP. Topics include application of network design and implementation of robust performance based computer networks, and an introduction to wireless and mobile networks. (Elective)

ENGE 481 Electrical Engineering Design I **3 credit hours**

Prerequisite: ENGR 381
The second course in the design sequence of formal design courses that emphasizes the design process. Student teams carry a project from inception to completion to satisfy the need of a client. In addition to technical design, factors such as safety, economics, and ethical and societal implications are considered.

ENGE 482 Electrical Engineering Design II **3 credit hours**
Prerequisite: ENGE 481
The third course in the design sequence where the student is exposed to engineering design and development. Design process culminates in prototype development, gathering performance data and presenting a final design briefing to peers and department faculty.

ENGE 495 Directed Research **1-6 credit hours**
Prerequisite: Junior or Senior status and permission of the instructor.
Research-oriented project or an independently-completed course of study in a specially designed area as approved and supervised by the instructor. May be repeated for up to 6 credits or as approved by the department chair.

ENGE 497 Topics in Electrical Engineering **3 credit hours**
Prerequisite: Permission of instructor.
Selected topics in various areas of Electrical Engineering. May be repeated for credit when topic varies.

ENGE 499 Internship **1-6 credit hours**
Prerequisite: Major in electrical engineering, permission of the instructor.
Placement in an electrical engineering or related organization for a controlled learning experience within the student's career specialization area. Application procedures processed through the Career Center.

(1st Read)

SB 1918 *(Undergraduate Curriculum Committee)*
Proposal for New Major: BS in Computer Engineering (B.S.) (ENGC)

General Education Requirements	**53 hours**
Foundational Studies (17 hours)	
ENGR 102 Technical Writing for Engineers	3 hrs
ENGL 102	3 hrs
COMS 101	3 hrs
MATH 131	4 hrs
EVAN 101	2 hrs
GNED 101	1 hr
GNED 102	1 hr
Investigative Studies (36 hours)	
ENGL 201, 202, 215, 216, 221, or 222	3 hrs
PHYS 231	4 hrs
PHYS 232	4 hrs
HISTORY	3 hrs
SOC SCI	3 hrs
HUMN 101	3 hrs
MATH 132	4 hrs
THEO 201	3 hrs
THEO 202	3 hrs
BIBL 105 or 205	3 hrs
BIBL 110 or 210	3 hrs
Other Requirements	**26-27 hours**
Quantitative Studies – (12 hours)	
ENGR 210 Probability and Statistical Methods for Engineering	3 hrs
MATH 231	3 hrs
MATH 350	3 hrs
MATH 334	3 hrs

Graduation Requirements (2-3 hours)

CRST 290	2 hrs
FRSM 101 -	0-1 hrs

Technical Electives – (12 hours minimum from list of approved Engineering Courses)

_____ ____	_ hrs
_____ ____	_ hrs
_____ ____	_ hrs
_____ ____	_ hrs

Computer Engineering Major Requirements **52 hours**

Required (50 hours)

CSCI 111 Computer Science I	3 hrs
CSCI 112 Computer Science II	3 hrs
ENGR 110 Introduction to Engineering and Problem Solving	3 hrs
ENGR 381 Engineering Design Introduction	3 hrs
ENGS 205 Professionalism in the Software Life Cycle	3 hrs
ENGE 201 Introduction to Logic Design	3 hrs
ENGE 211 Introduction to Electrical Circuits	4 hrs
ENGE 212 AC Circuit Analysis	4 hrs
ENGE 321 Electronics	4 hrs
ENGE 341 Communications Systems	3 hrs
ENGE 361 Computer Architecture	3 hrs
ENGE 421 Advanced Electronics	3 hrs
ENGE 465 Introduction to Computer Networks	3 hrs
*ENGC 301 Intro to Microprocessors	3 hrs
*ENGC 401 Micro Computer Design	3 hrs
*ENGC 481 Computer Engineering Design I	3 hrs
*ENGC 482 Computer Engineering Design II	3 hrs
*ENGC 495 Directed Research	1-6 hrs

*Indicates new courses, all other courses are existing courses or are introduced in another proposal.

New Courses

ENGC 301* Intro to Microprocessors **3 credit hours**

Prerequisite: ENGE 201 and MATH 350

Application of the principles introduced in ENGE 201. Concepts include digital and logic application to microcontroller function and use. Assembly language programming and hardware interface design are introduced

ENGC 401* Micro Computer Design **3 credit hours**

Prerequisite: ENGC 301

Advanced Microcomputer design. Concepts presented in ENGC 301 are applied to advance circuits. Study of 8 and 16 bit microcontroller function and use.

ENGC 481* Computer Engineering Design I **3 credit hours**

Prerequisite: ENGR 381

The second course in design sequence of formal design courses that emphasizes the design process. Student teams carry a project from inception to completion to satisfy the need of a client. In addition to technical design, factors such as safety, economics, and ethical and societal implications are considered.

ENGC 482* Computer Engineering Design II **3 credit hours**

Prerequisite: ENGC 481

The third course in the design sequence where students are exposed to engineering design and development. Design process culminates in prototype development, gathering performance data and presenting final design in briefing to peers and department faculty.

ENGC 495* Directed Research **3 credit hours**

Prerequisite: Junior or Senior status and permission of the instructor.

A research-oriented project or an independently-completed course of study in a specially designed area as approved and supervised by the instructor. May be repeated for up to 6 credits or as approved by the department chair.

ENGC 497* Topics in Computer Engineering **3 credit hours**
Prerequisite: Permission of instructor.
Selected topics in various areas of Computer Engineering. May be repeated for credit when topic varies.

ENGC 499* Internship
Prerequisite: Major in computer engineering, permission of the instructor.
Description: Placement in a computer or related organization for a controlled learning experience within the student's career specialization area. Application procedures processed through the Career Center.

(1st Read)

SB 1919 *(Undergraduate Curriculum Committee)*
Proposal for New Major: BS in Industrial and Systems Engineering (B.S.) (ENGI)

General Education Requirements	**53 hours**
Foundational Studies (17 hours)	
ENGR 102 Technical Writing for Engineers	3 hrs
ENGL 102	3 hrs
COMS 101	3 hrs
MATH 131	4 hrs
EVAN 101	2 hrs
GNED 101	1 hr
GNED 102	1 hr
Investigative Studies (36 hours)	
ENGL 201, 202, 215, 216, 221, or 222	3 hrs
PHYS 231	4 hrs
PHYS 232	4 hrs
HISTORY	3 hrs
SOC SCI	3 hrs
HUMN 101	3 hrs
MATH 132	4 hrs
THEO 201	3 hrs
THEO 202	3 hrs
BIBL 105 or 205	3 hrs
BIBL 110 or 210	3 hrs
Other Requirements	**26-27 hours**
Quantitative Studies – (12 hours)	
ENGR 210 Probability and Statistical Methods for Engineering	3 hrs
MATH 231	3 hrs
MATH 321	3 hrs
MATH 334	3 hrs
Graduation Requirements (2-3 hours)	
CRST 290	2 hrs
FRSM 101 -	0-1 hrs
Technical Electives – (12 hours minimum from list of approved Engineering Courses)	
_____ ____	_ hrs
_____ ____	_ hrs
_____ ____	_ hrs
_____ ____	_ hrs
Industrial and Systems Engineering Major Requirements	**52 hours**
Required (50 hours)	
ENGR 110 Introduction to Engineering and Problem Solving	3 hrs
ENGR 370 Quality Assurance	3 hrs
ENGR 377 Engineering Ethical & Legal Issues	3 hrs
ENGR 381 Engineering Design Introduction	3 hrs

*ENGI 220 Engineering Economy	3 hrs
*ENGI 230 Production Systems	3 hrs
*ENGI 300 Enterprise Forecasting	3 hrs
*ENGI 305 Data Analysis Methods & Modeling	3 hrs
*ENGI 320 Planning for Production	3 hrs
*ENGI 330 Facilities Design	3 hrs
*ENGI 340 Operations Research: Deterministic Models	3 hrs
*ENGI 350 Operations Research: Probabilistic Models	3 hrs
*ENGI 360 Engineering Information Systems	3 hrs
*ENGI 430 Decision Analysis	3 hrs
*ENGI 450 Human Factors and Ergonomics	3 hrs
*ENGI 460 Digital Simulation	3 hrs
*ENGI 481 Engineering Design I	3 hrs
*ENGI 482 Engineering Design II	3 hrs
*ENGI 495 Directed Research	1-6 hrs

*Indicates new courses, all other courses are existing courses or are introduced in another proposal.

New Courses

ENGI 220* Engineering Economy **3 credit hours**

Prerequisite : MATH 121 or equivalent.

Introduction to the principles of time value of money, analysis of investments, break-even concepts, risk analysis, alternatives analysis, tax implications, certainty and uncertainty.

ENGI 230* Production Systems **3 credit hours**

Prerequisite: MATH 131.

Introduction to manufacturing and production processes. Topics include production process as a human/machine system, planning, organizing, designing, and operating production systems.

ENGI 300* Enterprise Forecasting **3 credit hours**

Prerequisite: (MATH 121 and MATH 201) or MATH 211 or ENGR 210.

Advanced forecasting and data modeling methods and techniques.

ENGI 305* Data Analysis Methods & Modeling **3 credit hours**

Prerequisite: ENGI 300 or ENGR 210.

Revealing business and economic patterns and information hidden in data by transforming data using algebraic and statistical methods.

ENGI 320* Planning for Production **3 credit hours**

Co-requisites: ENGI 230 and 340.

Investigation of the principles, models and techniques for planning, scheduling, analyzing, designing and controlling production systems.

ENGI 330* Facilities Design **3 credit hours**

Prerequisite: ENGI 320.

A careful study of the design, analysis and selection of manufacturing facilities and material handling equipment. Topics include integration of computer systems, material flow and storage, and economic implications.

ENGI 340* Operations Research: Deterministic Models

3 credit hours

Prerequisites: ENGR 210 and MATH 321

Advanced study of the principles and application of deterministic analytical methods. Topics include linear programming, integer programming, dynamic programming and nonlinear optimization.

ENGI 350* Operations Research: Probabilistic Models

3 credit hours

Prerequisites: ENGI 340

Continued study of decision-making modeling and analysis subject to randomness, uncertainty, and risk. Topics include stochastic dynamic programming, Markov chains, and queuing theory.

ENGI 360* Engineering Information Systems **3 credit hours**

Prerequisite: (ENGR 110 or CSCI 110)
An overview of information systems used in the analysis, design, and management of complex engineering projects. Topics include identifying potential data anomalies and methods for ameliorating these problems.

ENGI 420* Advanced Data Analysis Methods & Modeling **3 credit hours**
Prerequisite: ENGI 305
The methods studied in the prerequisite courses are combined into hybrid models of business and enterprise that not only yield operational efficiencies but provide the information necessary for an enterprise to become and remain the leader in its field.
*Note: This course is an elective.

ENGI 430* Decision Analysis **3 credit hours**
Prerequisite: ENGI 350
A first course in decision analysis that extends the domain of decision-making problems from those considered in traditional statistical hypothesis testing scenarios: modeling decisions, where the emphasis is on structuring decision problems using techniques such as influence diagrams and decision trees, modeling uncertainty, which covers subjective probability assessment, use of classical probability models, Bayesian analysis, and value of information, and modeling preferences, which introduces concepts of risk preference, expected utility, and multi-attribute value and utility models.

ENGI 450* Human Factors and Ergonomics **3 credit hours**
Prerequisite: Senior standing in Engineering.
Human biological and psychological capabilities and limitations in the industrial setting. Topics include techniques and methods for applying the principles of human factors engineering and ergonomics to systems design.

ENGI 460* Digital Simulation **3 credit hours**
Prerequisites: ENGR 210, ENGI 340, and computer programming skills.
Introduction to the structure, logic and methodologies of systems simulation. Topics include the generation of random numbers, simulation languages, and simulation models and analysis.

ENGI 481* Engineering Design I **3 credit hours**
Prerequisites: Senior Status and Instructor Approval.
The first course in the capstone design sequence that emphasizes the analysis and design of manufacturing systems, systems integration, safety, economics, as well as the ethical and societal implications of the design.

ENGI 482* Engineering Design II **3 credit hours**
Prerequisite: ENGI 481
The second course in the design sequence where the emphasis is on detailed design and system development. The course culminates in the development of a prototype, tests for requirement completeness and performance, and a final presentation to peers and department faculty.

ENGI 495* Directed Research **3 credit hours**
Prerequisite: Junior or Senior status and permission of the instructor.
A research-oriented project or an independently-completed course of study in a specially designed area as approved and supervised by the instructor. May be repeated for up to 6 credits or as approved by the department chair.

ENGI 497* Topics in Industrial & Systems Engineering **1-4 credit hours**
Prerequisite: Permission of instructor.
Selected topics in various areas of Industrial & Systems Engineering. May be repeated for credit when topic varies.

ENGI 499* ISE Internship **1-4 credit hours**
Prerequisite: Major in Industrial and Systems Engineering, permission of the instructor, and junior or senior status.
Placement in a manufacturing plant, hospital, library, police department, or similar location or related organization for a controlled learning experience within the student's career specialization area. Application procedures processed through the Career Center.

Changes to Existing Courses

CMIS 300 Enterprise Forecasting 3 credit hours
Changes to:
CMIS 300 Enterprise Forecasting **3 credit hours**
Prerequisite: (MATH 121 and MATH 201) or MATH 211 or ENGR 210
Cross listed with: ENGI 300 Enterprise Forecasting
Advanced forecasting and data modeling methods and techniques.

CMIS 305 Data Modeling	3 credit hours
Changes to:	
CMIS 305 Data Analysis Methods & Modeling	**3 credit hours**
Prerequisite: CMIS 300 or ENGR 210	
Cross listed with: ENGI 305 Data Analysis Methods & Modeling	

CMIS 420 Advanced Data Modeling	3 credit hours
Changes to:	
CMIS 420 Advanced Data Analysis Methods & Modeling	**3 credit hours**
Prerequisite: CMIS 305	
Cross listed with: ENGI 420 Advanced Data Analysis Methods & Modeling	

(1st Read)

SB 1920 *(Undergraduate Curriculum Committee)*
Proposal for New Major: BS in Software Engineering (B.S.) (ENGS)

General Education Requirements	**53 hours**
Foundational Studies (17 hours)	
ENGR 102 Technical Writing for Engineers	3 hrs
ENGL 102	3 hrs
COMS 101	3 hrs
MATH 131	4 hrs
EVAN 101	2 hrs
GNED 101	1 hr
GNED 102	1 hr
Investigative Studies (36 hours)	
ENGL 201, 202, 215, 216, 221, or 222	3 hrs
PHYS 231	4 hrs
PHYS 232	4 hrs
HISTORY	3 hrs
SOC SCI	3 hrs
HUMN 101	3 hrs
MATH 132	4 hrs
THEO 201	3 hrs
THEO 202	3 hrs
BIBL 105 or 205	3 hrs
BIBL 110 or 210	3 hrs
Other Requirements	**26-27 hours**
Quantitative Studies (12 hours)	
ENGR 210 Probability and Statistical Methods for Engineering	3 hrs
MATH 231	3 hrs
MATH 321	3 hrs
MATH 334	3 hrs
Graduation Requirements (2-3 hours)	
CRST 290	2 hrs
FRSM 101	0-1 hrs
Directed Electives (3 hours)	
PSYC 405	3 hrs
Technical Electives (9 hours minimum from list of Approved Technical Electives)	
____ ____	_ hrs
____ ____	_ hrs
____ ____	_ hrs

Software Engineering Major Requirements **52 hours**

Required (43 hours)

CSCI 110 Computer Foundations and Ethics	3 hrs
CSCI 111 Computer Science I	3 hrs
CSCI 112 Computer Science II	3 hrs
CSCI 215 Algorithms and Data Structures	3 hrs
*ENGS 205 Professionalism in the Software Life Cycle	3 hrs
*ENGS 361 Software Requirements Analysis	3 hrs
*ENGS 362 Software Design & Architecture	3 hrs
**ENGS 363 Software Testing & QA	3 hrs
**ENGS 375 Usability Engineering & HCI	3 hrs
*ENGS 405 Secure Software Engineering	3 hrs
*CSCI 434 Theory of Programming Languages	3 hrs
**CMIS 460 Project Management	3 hrs
*ENGS 481 Senior Capstone Projects I	3 hrs
*ENGS 482 Senior Capstone Projects II	3 hrs
*ENGS 495 Directed Research	1-6 hrs

Choose three of the following (9 hours)

CSCI 342 Computer Architecture and Development	3 hrs
CSCI 443 Operating Systems	3 hrs
**CSCI 325 File Processing and Data Base Structures	3 hrs
**CSCI 355 Computer Network Architecture and Programming	3 hrs

*New Courses

** Modified courses or new courses that have already been taught as special topics.

New Software Engineering Courses (ENGS)

CSCI 355 Computer Network Architecture and Programming **3 credit hours**

Prerequisite: CSCI 215 or permission of instructor.

A study of how computer networks and internets operate. Investigates networking from the level of data transmission and wiring through the level of application software that provides networking functionality. Topics include data and packet transmission, LANs and WANs, and internet concepts, including architecture, protocol layering, and application software.

ENGS 205 Professionalism in the Software Life Cycle **3 credit hours**

Prerequisite: CSCI 112

Principles of software engineering and professional software engineering practice and ethics. Topics include object-oriented analysis using UML, frameworks, APIs, the client-server architecture, interface programming, security, intellectual property and social consequences, which are presented within the context of the software life cycle.

ENGS 361 Software Requirements Analysis **3 credit hours**

Prerequisite: ENGS 205 & CSCI 112

Principles and techniques for eliciting and representing software requirements, including validation techniques, measurement of external qualities, documentation standards, traceability, and requirements management.

ENGS 362 Software Design & Architecture **3 credit hours**

Prerequisite: ENGS 361 & CSCI 215. May be taken concurrently with ENGS 361.

In-depth view of the design phase of the software life cycle, including a study of design patterns, frameworks, architectures and an introduction to reengineering and reverse. The appropriate use of metrics will be used to measure design qualities in evolving designs.

ENGS 363 Software Testing & QA **3 credit hours**

Prerequisite: ENGS 361, ENGS 362 & CSCI 215. May be taken concurrently with ENGS 362.

The study of systematic software verification and validation (V&V) and quality assurance, including both process and product. Topics include testing management, testing throughout the life cycle, non-execution and execution based testing techniques, test metrics, and the roles involved in the testing process.

ENGS 405 Secure Software Engineering **3 credit hours**

Prerequisite: ENGS 361 or ENGS 362 or ENGS 363

Survey of the basic issues of information system security and the engineering principles used to secure software systems. Topics include the planning, management, policies, procedures, and personnel needed to protect the confidentiality, integrity, and availability

of information systems. Additional topics include specific threats, such as malicious code and network attacks, and commonly used countermeasures, such as access control, firewalls, and intrusion detection systems.

ENGS 481 Senior Capstone Projects I **3 credit hours**
Prerequisite: Senior standing, ENGS 363 & ENGS 375
Students will develop a significant real software system while following appropriate project management techniques, including the development of a project plan, requirements, design, implementation, and quality assurance. Continued in ENGS 482.

ENGS 482 Senior Capstone Projects II **3 credit hours**
Prerequisite: ENGS 481
Continuation of ENGS 481. Completion of the software system initiated in ENGS 481 while considering factors such as safety, security, economics, and ethical and societal implications.

ENGS 495 Directed Research **1-6 credit hours**
Prerequisite: Junior or Senior status and permission of the instructor.
Research-oriented project or an independently-completed course of study in a specially designed area as approved and supervised by the instructor. May be repeated for up to 6 credits or as approved by the department chair.

ENGS 497 Topics in Software Engineering **3 credit hours**
Prerequisite: Permission of the instructor.
Selected topics in various areas of Software Engineering. May be repeated for credit when topic varies.

ENGS 499 Internship **1-6 credit hours**
Prerequisite: Major in software engineering or computer science, permission of the instructor, and junior or senior status.
Placement in a software or related organization for a controlled learning experience within the student's career specialization area. Application procedures processed through the Career Center.

Changes to Existing Courses

CSCI 375 Introduction to Human Computer Interaction 3 credit hours
Changes to:
ENGS 375 Usability Engineering & HCI **3 credit hours**

CMIS 460 IS Project Management
Changes to:
CMIS 460 Project Management **3 credit hours**
Prerequisites: 3 hours of ECNC and either CMIS 351 or ENGS 362

CSCI 424 File Processing and Data Base Structures 3 credit hours
Changes to:
CSCI 325 File Processing and Data Base Structures **3 credit hours**

(1st Read)

Prayer

Adjournment