COMMITTEE: University Curriculum Committee

MEETING DATE: March 27, 2014

PERSONS PRESIDING: Lori Flint

REGULAR MEMBERS IN ATTENDANCE: David Batts, Michael Dingfelder, Donna Kain, Lori Flint, Amy McMillan, and Mark Richardson

EX-OFFICIO MEMBERS IN ATTENDANCE: Josie Bowman, Rita Reaves, Jean-Luc Scemama, Katherine Swank, and Karen Vail-Smith

EXCUSED: Leigh Cellucci

ABSENT:

SUPPORT: Teresa Woolverton, Kimberly Nicholson

OTHERS IN ATTENDANCE:
Thomas Harriot College of Arts and Sciences, Department of Chemistry, Eli Hvastkovs
College of Human Ecology, School of Hospitality Leadership, George Fenich, Robert O-Halloran
Thomas Harriot College of Arts and Sciences, Department of Economics, Fan-chin Kung
Thomas Harriot College of Arts and Sciences, Department of Geography, Planning, and Environment, Burrell Montz
Thomas Harriot College of Arts and Sciences, Department of Religious Studies, Calvin Mercer, Mary Nyangweso
College of Fine Arts and Communication, School of Theatre and Dance, Natalie Stewart
College of Education, Business and Information Technologies Education, John Swope and Vivian Covington
Thomas Harriot College of Arts and Sciences, Department of Mathematics, Gail Ratcliff
College of Technology and Computer Science, Department of Engineering, Ricky Castles, Tarek Abdel-Salam
Office of the Registrar, Diane Coltraine

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**ACTIONS OF MEETING**

**Agenda Item:** I. Call to Order

1. Minutes
   The 3/7/14 UCC minutes was distributed for an electronic vote and approved by the majority of the committee.

   **Discussion:** N/A

   **Action Taken:** N/A
Agenda Item: II. New Business

(1.) Proposed reorganization of curriculum development manual.

Discussion: The committee started working on the reorganization of the Curriculum development manual over spring break. The old Table of Contents listed only two chapters, while the new Table of Contents has many more specific subheadings and chapters. There is no change of the content, just reorganization with subheadings to make it easier to find items. There was some discussion about where the appendices will be since the manual is shared between UCC and program development.

Action Taken: Dr. Batts made a motion to accept the conceptual framework as presented, and Dr. McMillan seconded the motion. The motion was approved.

(2.) Changing course prefixes

Discussion: The issue of the procedure for changing course prefixes was discussed. The members decided that when the prefix for an entire list of courses is revised to a new prefix, marked catalog copy will not be required for this type of package. The unit will be required to submit a memorandum of request, completed signature form, and notification of affected units. If a unit revises the prefix for selected courses only, then marked catalog copy will be required.

Action Taken: Dr. Batts made a motion to approve, and Dr. McMillan seconded the motion. The motion was approved.

Agenda Item: III. Thomas Harriot College of Arts and Sciences, Department of Chemistry

Eli Hvaskovs

(1.) Prerequisite Revision of Existing Course(s): CHEM 1160

Discussion: Dr. Hvaskovs stated that the Chemistry department faculty wants to change the prerequisites for a few courses and increase minimum grades achieved. Additionally, the department wants to change the number of credit hours for graduation. Dr. Hvaskovs explained that the reduction of credit hours would entail just a reduction in the electives for the major. Dr. Flint stated that the only change needed is for the department is to address the memorandum to the UCC committee.

Action Taken: Dr. McMillan made a motion to approve, and Dr. Batts seconded the motion. The motion was approved.

(2.) Request to Revise Exiting Degree(s): Chemistry, BA; Chemistry, BS
Discussion: The committee agreed with the revised degrees.

Action Taken: Dr. McMillan made a motion to approve, and Dr. Batts seconded the motion. The motion was approved.

Agenda Item: IV. College of Human Ecology, School of Hospitality Leadership
George Fenich, Robert O’Halloran

(1.) Proposal of New Course(s): HMGT 4040

Discussion: Dr. Fenich summarized the main changes to the curriculum and the addition of a new course. His specialty is meeting events and is working on a task force to create a course more closely aligned to industry standards for the students. This course was a special-topics course, but now the faculty wants to add it to the concentration as a regular course. Dr. Swank says that the budgetary memo was acceptable. Dr. Swank asked if the textbook was required and if this was the most current edition, and Dr. Fenich said that it was required and would indicate this on the form. He stated that the text was in the process of being revised and that the newer revised version would be used when it becomes available. Dr. Swank asked Dr. Fenich about the marked catalog copy that states a change on page 2 from “select three” courses to “select two” courses. He explained that now one course is required, there would only be two courses from which to choose. Dr. Reaves stated that this change should be specified in the memo.

Action Taken: Dr. Swank moved to accept as the amended, and Dr. McMillan seconded the motion. The motion was approved.

Agenda Item: V. Thomas Harriot College of Arts and Sciences, Department of Economics
Fan-chin Kung

(1.) Request to Unbank Existing Course(s): ECON 4740

Discussion: Dr. Kung explained that the faculty requests to unbank a course now that they have sufficient qualified faculty to teach it. He initially stated that there were no changes—but then he says that there were some revisions made when they unbanked it. Dr. Kain asked Dr. Kung to fill in Item 7 with the changes made to the course including the updating of the course objectives. Dr. Kung stated that he would make the changes to the course proposal.

Action Taken: Dr. Scemama moved to approve as amended, and Dr. McMillan seconded the motion. The motion was approved.
Agenda Item: VI. Thomas Harriot College of Arts and Sciences, Department of Geography, Planning, and Environment
Burrell Montz

(1.) Request to Revise Existing Course(s): PLAN 1900

Discussion: Dr. McMillan stated that the documents looked perfect and that there was nothing found to be in error.

Action Taken: Dr. McMillan moved to approve, and Dr. Batts seconded the motion. The motion was approved.

Agenda Item: VII. Thomas Harriot College of Arts and Sciences, Religious Studies
Calvin Mercer, Mary Nyangweso

(1.) Proposal of New Course(s): RELI 2340, 2350

Discussion: Dr. McMillan asked Dr. Mercer about the process in which the curriculum was approved. Dr. Mercer explained that Religious Studies is a Multidisciplinary department and reports to the Dean of Arts and Sciences. He stated that the committee that makes decisions about the curriculum includes all the religion professors as well as some other faculty. The faculty has reviewed the changes and approved them. The UCC committee is satisfied with the memorandum submitted that has faculty approval. Dr. McMillan stated that the justification (Item #5) of the course proposals should state that the committee reviewed and voted to approve these new courses. Dr. Reaves mentioned that the textbook for RELI 2340 seemed fine but perhaps dated (1997), and Dr. Mercer stated that the textbook is the best right now but he is looking for more current texts. Dr. Reaves commented that the faculty might consider RELI 2350 as a writing intensive course if that would be useful to the program, and Dr. Mercer said they would consider that.

Action Taken: Dr. Batts moved to accept the new courses as amended, and Dr. McMillan seconded the motion. The motion was approved.

(2.) Request to Revise Existing Minor(s): Religious Studies Minor

Discussion: Dr. Batts stated that the marked catalog copy looked fine, and the committee agreed to the revision of the minor.

Action Taken: Dr. Batts moved to accept, and Dr. McMillan seconded the motion. The motion was approved.
Agenda Item: VIII. College of Fine Arts and Communication, School of Theatre and Dance, Natalie Steward

(1.) Request to Delete Existing Course(s): THEA 2004, 2010, 2020, 3005, 3010, 3018, 3019, 3020, 3025, 3050, 4003, 4018, 4040, 4065

Discussion: Professor Steward explained that the request was not to delete courses from the catalog but just the list of permissible electives. The agenda will be amended to reflect that the deletion of the list of Theatre electives is to clean up the catalog copy and make clear that ANY theatre class can fulfill the theatre elective requirement. There have been new theatre courses added to the catalog since the list of possible electives was initially compiled. Professor Vail-Smith recommended that the catalog copy be changed from the statement “Any THEA course except 1000 can be taken for theatre elective credit” to the positive statement, “THEA 1000 is not eligible for theatre elective credit as it is for non-majors only.” Professor Steward agreed to make this change and resubmit a revised memo and catalog copy.

Action Taken: Dr. Batts moved to approve as amended, and Dr. McMillan seconded the motion. The motion was approved.

(2.) Request to Revise Existing Degree(s): Theatre Arts, BFA

Discussion: Professor Steward explained the changes desired to the Theatre Arts major. The faculty wants to add additional English courses to the list of those that will fulfill Foundation humanity requirements for the major. Professor Vail-Smith stated that the memo should state the faculty voted to approve the changes mentioned, and Professor Steward said the change to the memo would be made.

Action Taken: Dr. Batts moved to approve as amended, and Dr. McMillan seconded the motion. The motion was approved.

Agenda Item: IX. College of Education, Business and Information Technologies Education
John Swope, Vivian Covington

(1.) Request to Revise Existing Course(s): BITE 2123, 4323, 4324, 4400

Discussion: Dr. Swope discussed the revision to the information technology education curriculum. On the Resource Justification Form submitted, Dr. Flint suggested that the faculty not be specific about names of faculty members that can teach the course (just those qualified), and Dr. Swope agreed to make that change for all four courses. Dr. Batts stated that the justification (Item 5) for all four courses must state that the faculty voted to approve, and that the textbook cited must be specified as required or optional. Dr. Swope stated that the text was required and that he would make the revision. Dr. Richardson commented that
for BITE 3300, the top right box in Item 13 needs to state 3 credit hours. Dr. Reaves suggested to Dr. Swope that the faculty consider in the future whether some of these courses could be approved as writing intensive courses. Dr. McMillan stated that the youtube link should be removed from the catalog copy. Dr. Batts says to make sure the marked catalog copy is edited carefully and changes to the course proposals be added to the marked catalog copy where appropriate.

Action Taken: Dr. Batts moved to approve as amended, and Dr. Kain seconded the motion. The motion was approved.

Agenda Item: X. Thomas Harriot College of Arts and Sciences, Department of Mathematics
Gail Ratcliff

(1.) Proposal of New Course(s): MATH 4005

Discussion: Dr. Ratcliff explains the justification for the new course. Dr. Kain asked if the last sentence of the course description can be removed, and Dr. Ratcliff agreed. Dr. Kain reminded her to remove it from the marked catalog copy as well. Dr. McMillan asked if the course is both required for some majors and an elective for others (as listed on the form), and Dr. Ratcliff said yes that was the case.

Action Taken: Dr. Batts made a motion to approve as amended, and Dr. Kain seconded the motion. The motion was approved.

(2.) Request to Revise Existing Course(s): MATH 3263

Discussion: Dr. Ratcliff explained the revision to the course and justification for the revision. Dr. Ratcliff clarified that the course is required in some majors and an elective in the minors.

Action Taken: Dr. Batts made a motion to approve as amended, and Dr. Kain seconded the motion. The motion was approved.

(3.) Prerequisite Revision of Existing Course(s) (no content revision): MATH 2153, 2172, 2300, 3256, 4101, 4110, 4331

Discussion: The committee agreed to the revisions.

Action Taken: Dr. Batts made a motion to approve, and Dr. Kain seconded the motion. The motion was approved.

(4.) Request to Delete Existing Course(s): MATH 5000
Discussion: The committee agreed that MATH 5000 could be deleted from the undergraduate catalog copy. Dr. Kain stated that a statement should be included within the memo about its deletion from the catalog, and the reference should be changed to MATH 4005 that has been established to take its place.

Action Taken: Dr. Batts made a motion to approve as amended, and Dr. Kain seconded the motion. The motion was approved.

(5.) Request to Revise Existing Degree(s): Mathematics, BA; Mathematics, BS

Discussion: Dr. Kain had reviewed the marked catalog copy and made the following suggestions for revision:
- with reference to the MATH 2153 prerequisite, the ordering or the minimum grade of C before both courses is unclear; please move the minimum grade and list it with each course. Ms. Coltraine stated that she would revise the catalogs to ensure MATH prerequisites are consistent.
- Dr. Kain stated the number of hours listed under 5. Concentration area (31-40 s.h.) was unclear in light of what followed. She recommended changing the listing from “31-40 s.h.” to “27-36 s.h.”

Action Taken: Dr. Batts made a motion to approve as amended, and Dr. Kain seconded the motion. The motion was approved.

(6.) Request to Revise Existing Minor(s): Statistics Minor

Discussion: The committee agreed to the revision of the minor with the addition of the changes suggested to the marked catalog copy mentioned above.

Action Taken: Dr. Batts made a motion to approve as amended, and Dr. Kain seconded the motion. The motion was approved.

Agenda Item: XI. College of Technology and Computer Science, Department of Engineering
Ricky Castles, Leslie Pagliari

(1.) Proposal of New Course(s): MENG 4343

Discussion: Dr. Castles explained the changes the faculty was making to the catalog listings in preparation for an accreditation visit. He stated that there are some minor revisions being brought forward and one new course. Dr. Scemama reviewed the new course MENG 4343 and stated the course justification (Item #5) and the memorandum of request need to state that the faculty voted and approved the new course. He also stated that the justification needed to be strengthened to make it clear why the course is needed. Dr. Kain asked whether the statement “3 lecture hours per week” could be removed, but Dr. Castles replied that the inclusion of this statement was to be consistent throughout the catalog. Dr.
Scemama asked whether the textbook was required and if it was the recent version; Dr. Castles clarified that the text was not required, but he will investigate to see if the text listed was the most current edition.

**Action Taken:** Dr. Batts made a motion to accept as amended, and Dr. McMillan seconded the motion. The motion was approved.

(2.) Request to Revise Existing Course(s): EENG 4510

**Discussion:** Dr. Scemama reviewed the revision of EENG 4510 and suggested the following changes:
- the course justification should be strengthened and include mention that the faculty had voted and approved the course revision
- the textbook needs to be specified as required or optional
- the grading scale needs to be updated to include the +/- grading scale
- remove the number of classes in the course topic outline

**Action Taken:** Dr. Batts made a motion to accept as amended, and Dr. McMillan seconded the motion. The motion was approved.

(3.) Request to Revise Existing Course(s)(no content revision): BIME 4040, 4050; EENG 2410, 3020, 3530, 3750, 4510; ENGR 2022, 2450, 3420, 3800; ISYS 4410; MENG 3070, 3624, 4018, 4260, 4650

**Discussion:** The committee agreed to the revision of courses listed overall, but there was an issue addressed. Dr. Dingfelder had reviewed the catalog copy and observed a change had been made to courses in the number of hours met per week; this change was not the way the course had originally been approved or had been listed in the catalog. Dr. Kain stated that while this was considered catalog cleanup, the faculty still need to submit course proposals for these revisions. These course changes will need to be deleted from the marked catalog copy until the course proposals are brought forward for review at a subsequent UCC meeting. Dr. Kain clarified that this marks a credit-hour change in course delivery since the 3 credit hours are being used differently. She stated that the memo should be revised and resubmitted with the two courses removed until they can be revised and resubmitted at a future meeting. Dr. Flint stated that there would be a place holder on the next meeting’s agenda for the discussion of these course revisions provided they were submitted by the following Wednesday.

**Action Taken:** Dr. Batts made a motion to accept as amended, and Dr. McMillan seconded the motion. The motion was approved.

(4.) Request to Renumber and Change Prefix to Existing Course(s)(no content revision):
- SYSE 4000 (to ISYS 4203), ENMA 3000 (to ENGR 3013), ENMA 4010 (to ENGR 4033), ENMA 4030 (to ISYS 4303)
Discussion: The committee agreed to the renumbering and prefix changes for existing courses.

Action Taken: Dr. Batts made a motion to accept as amended, and Dr. McMillan seconded the motion. The motion was approved.

(5.) Prerequisite Revisions to Existing Course(s)(no content revision): BIME 2080; ENGR 1012, 1014, 1016, 2000, 2022, 2050, 2070, 2450, 3000, 3013, 3420, 4010, 4033, 4510; ISYS 3010, 3060, 4010, 4203

Discussion: Dr. Dingfelder stated that a change was being made to the engineering co—op program edibility that needed to be clarified in the marked catalog copy (see page 2 of catalog copy). In the sentence that begins “To be eligible for the engineering co-op program” there should be the addition of “or ENGR 1014” after “ENGR 1016.” Additionally, since ENGR 3014 and ENGR 3060 are being deleted from the course listing in the marked catalog copy (as referenced in the memo), there needs to be a strike thru in the course descriptions of these courses in the marked catalog copy.

Action Taken: Dr. Batts made a motion to accept as amended, and Dr. McMillan seconded the motion. The motion was approved.

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Agenda Item: VII. Old Business

No items for this meeting

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Curricular Actions Reviewed at This Meeting:

New Courses: 5
Revised/Renumbered/Unbanked Courses (includes title/prereq./prefix): 56
New Degrees/Programs: 0
New Minors: 0
New Concentrations: 0
New Certificates: 0
Revised Existing Degrees/Concentrations/Departmental Text: 5
Deletion of Existing Degrees/Concentrations: 0
Revised Minors/Certificates: 1
Deletion of Existing Minors/Certificates: 0
Banked Courses: 0
Deletion of Existing /Banked Courses: 15

Curricular Actions Reviewed to Date (to include this meeting):

New Courses: 90
Revised/Renumbered/Unbanked Courses (includes title/prereq./prefix): 450
New Degrees/Programs: 1
New Minors: 1
New Concentrations: 10
New Certificates: 1
Revised Existing Degrees/Concentrations/Departmental Text 62
Deletion of Existing Degrees/Concentrations: 8
Revised Minors/Certificates: 10
Deletion of Existing Minors/Certificates: 2
Banked Courses: 23
Deletion of Existing /Banked Courses: 80

**NEXT MEETING:** April 10, 2014

**ITEMS TO BE DISCUSSED:** see agenda

Dr. Flint made a motion to adjourn at 4:15 pm. The motion passed and the meeting was adjourned.

Respectfully Submitted by

Mark D. Richardson
Secretary of the UCC
Marked Catalog Copy:

Agenda Item III.
Thomas Harriot College of Arts and Sciences
Department of Chemistry

http://catalog.ecu.edu/preview_program.php?catoid=4&poid=666

CHEMISTRY, BA

The BA program provides a flexible major designed to provide the student with a broad education in chemistry appropriate for further study in a wide range of fields, such as business, medicine, pharmacy, and law as well as careers dependent on a basic knowledge in chemistry. The BA in chemistry, in conjunction with two semesters of laboratory-based biology courses, satisfies the course requirements for application to most US medical schools. It is different than the BS degree in the required chemistry, math, and physics courses. Any of the required major courses or cognates, however, may be replaced by courses that cover the same topics at a more advanced level. For example, CHEM 3950, CHEM 3960 may be taken instead of CHEM 3850. It is the student’s responsibility to ensure that the prerequisites for such courses have been met. If a student successfully completes a higher-level cognate course after bypassing the lower-level prerequisite course(s), he/she may use free electives to substitute for the prerequisite hours. All students are required to take a departmentally administered assessment examination before graduation. Scores from this examination will not be included in the calculation of GPA for academic standing. The performance on this exam will be noted on the student’s transcript. Minimum degree requirement is 120 s.h. 126 s.h. of credit as follows:

http://catalog.ecu.edu/preview_program.php?catoid=4&poid=693

CHEMISTRY, BS

The BS degree in chemistry is the appropriate program for students considering advanced degree programs in chemistry, biochemistry, and other related fields or a professional career in chemistry. Graduates of this program meet certification requirements of the American Chemical Society. Students are strongly encouraged to pursue undergraduate research with a faculty member. Up to 6 s.h. of undergraduate research may be applied toward degree requirements. Information regarding undergraduate research may be obtained from the director of undergraduate studies. Students completing the BS degree are encouraged to consider some of the following courses as electives: COMM 2410 or COMM 2420; ITEC 3290 or ENGL 3820; MATH 2228, MATH 3256, MATH 4331; CHEM 4515, CHEM 4516, CHEM 4517; advanced 5000-level courses in chemistry; and BIOL 5800 or BIOL 5810. If a student successfully completes a higher-level cognate course after bypassing the lower-level prerequisite course(s), he/she may use free electives to substitute for the prerequisite hours. All students are required to take a departmentally administered assessment examination before graduation. Scores from this examination will not be included in the calculation of GPA for academic standing. The
performance on this exam will be noted on the student’s transcript. Minimum degree requirement is 120 s.h. 126 s.h. of credit as follows:

Proposed Prerequisite Changes

http://catalog.ecu.edu/preview_entity.php?catoid=4&ent_oid=286&returnto=256

CHEM 2250 - Quantitative and Instrumental Analysis

3 WI F,S

3 lecture and 4 lab hours per week. P: CHEM 1160 with minimum grade of C (2.0) CHEM 1160, CHEM 1161; CHEM 2650 or CHEM 2750; C: CHEM 2251. Theories and techniques of classical quantitative and modern instrumental analysis.

Organic Chemistry I
CHEM 2750 - Organic Chemistry I

3 F,S,SS

P: CHEM 1160 with minimum grade of C (2.0) CHEM 1160, CHEM 1161; C: CHEM 2753. Classes of compounds and their typical reactions, mechanisms, stereochemistry, and instrumental methods in organic chemistry.

Agenda Item IV.
College of Human Ecology
School of Hospitality Leadership

http://catalog.ecu.edu/preview_entity.php?catoid=4&ent_oid=332&returnto=256

HMGT 4040 - Producing Meetings, Events, and Conventions
3
P: HMGT 3400. In-depth assessment of logistics and production of meetings, events, and conventions.

http://catalog.ecu.edu/preview_program.php?catoid=4&poid=846

Hospitality Management, BS
Each HMGT course must be completed with a minimum grade of C- (1.7). Minimum degree requirement is 126 s.h. of credit as follows:

1. **Foundations curriculum requirements including those listed below - 42 s.h.**

   (For information about courses that carry foundations curriculum credit see *Liberal Arts Foundations Curriculum* )

   - ECON 2113 - Principles of Microeconomics
   - MATH 1066 - Applied Mathematics for Decision Making

2. **Common Core - 45 s.h.**

   - HMGT 1350 - Introduction to Hospitality Management
   - HMGT 1500 - Multicultural Hospitality Management
   - HMGT 2100 - Lodging Management I
   - HMGT 2170 - Hospitality Services Management
   - HMGT 2200 - Introduction to Conventions and Special Events
   - HMGT 2300 - Principles of Food Preparation and Menu Planning
   - HMGT 2301 - Principles of Food Preparation and Menu Planning Lab
   - HMGT 2591 - Field Experience in Hospitality Management I
   - HMGT 3200 - Dimensions of Tourism
   - HMGT 3750 - Hospitality Facilities Management
   - HMGT 4244 - Hospitality Law
   - HMGT 4308 - Cost Controls for Hospitality Operations
   - HMGT 4440 - Hospitality Marketing
   - HMGT 4450 - Hospitality Human Resource Management
   - HMGT 4650 - Hospitality Financial Management
   - HMGT 4700 - Hospitality Management Current Issues Seminar

3. **Concentration area - 18 s.h.**

   (Choose one.)

   **Lodging Management:**
• HMGT 3600 - Lodging Management II
• HMGT 3990 - Field Experience in Lodging Management
• HMGT 4100 - Lodging Revenue Management
• HMGT 4300 - Advanced Food Production and Service Management
• HMGT 4301 - Advanced Food Production and Service Management Lab
• Select two 3000 or 4000-level HMGT courses in addition to core and concentration courses.

Food and Beverage Management:

• HMGT 3300 - Principles of Classical Cuisine
• HMGT 3301 - Principles of Classical Cuisine Lab
• HMGT 3991 - Field Experience in Food and Beverage Management
• HMGT 4120 - Wine and Beverage Management
• HMGT 4300 - Advanced Food Production and Service Management
• HMGT 4301 - Advanced Food Production and Service Management Lab
• Select two 3000 or 4000-level HMGT courses in addition to core and concentration courses.

Convention and Special Events Management:

• HMGT 3400 - Meeting, Event, and Convention Planning
• HMGT 3992 - Field Experience in Conventions and Special Events Management
• HMGT 4040 - Producing Meetings, Events, and Conventions
• HMGT 4400 - Convention Sales and Services Management
• Select three two 3000 or 4000-level HMGT courses in addition to core and concentration courses.

4. Business administration minor - 24 s.h.

Agenda Item V.
Thomas Harriot College of Arts and Sciences
Department of Economics

http://catalog.ecu.edu/preview_entity.php?catoid=4&ent_oid=287&returnto=256
Department of Economics

Richard E. Ericson, Chairperson, A-428 Brewster Building

Faculty

- Department of Economics Faculty

Economics Honors Program

Participation in the honors program is limited to seniors who have obtained a minimum cumulative GPA of 3.5. A minimum grade of B (3.0) in ECON 4550 is a prerequisite for admission to ECON 4551. Completion of both courses with a minimum grade of B (3.0) is necessary to receive departmental honors.

Programs

Bachelor’s

- Economics, BA
- Economics, BS

Minor

- Economics Minor

Courses

Economics

- ECON 2113 - Principles of Microeconomics
- ECON 2133 - Principles of Macroeconomics
- ECON 2600 - Introduction to Economic and Sustainable Design Approaches to Managing Coastal Resources
- ECON 3030 - Antitrust and Regulation
- ECON 3144 - Intermediate Microeconomics
- ECON 3244 - Intermediate Macroeconomics
- ECON 3323 - Topics in Economics
- ECON 3343 - Econometrics
- ECON 3353 - Development Economics
- ECON 3365 - Russian Economic Transition
- ECON 3420 - Money and Banking
- ECON 3630 - Health Economics
- ECON 3750 - Economics of Poverty and Discrimination
- ECON 3855 - Environmental Economics
- ECON 3960 - Economics of Public Choice
- ECON 4020 - Industrial Organization
- ECON 4214 - Public Finance
- ECON 4230 - Labor in Economics
- ECON 4373 - International Trade
- ECON 4430 - Business Cycles and Forecasting
- ECON 4521 - Independent Study and Research in Economics
- ECON 4522 - Independent Study and Research in Economics
- ECON 4523 - Independent Study and Research in Economics
- ECON 4550 - Honors I
- ECON 4551 - Honors II
- ECON 4740 - Urban and Regional Economics
- ECON 4850 - Resource Economics
- ECON 5000 - General Topics
- ECON 5150 - Development
- ECON 5170 - Resources I
- ECON 5360 - Mathematical Economics
- ECON 5501 - Macroeconomic Theory
- ECON 5800 - Public Economics
- ECON 5910 - Health Economics

Economics Banked Courses

- ECON 1000 - General Economics
- ECON 2250 - Introduction to Econometrics
- ECON 3363 - Comparative Economics Systems
- ECON 3520 - Mathematical Economics
- ECON 4024 - Regional Development
- ECON 4740 - Urban and Regional Economics

http://catalog.ecu.edu/preview_entity.php?catoid=4&ent_oid=287&returnto=256

ECON 4740 - Urban and Regional Economics
3
P: ECON 3144. Analysis of economic decisions over land and location, organization of cities, and development of regions.

Agenda Item VI.
Thomas Harriot College of Arts and Sciences
Department of Geography, Planning, and Environment

http://catalog.ecu.edu/preview_entity.php?catoid=4&ent_oid=290&returnto=256
PLAN 1900 - Sustainable Cities
3 F, S FC:SO GD
Overview of planning concepts applied to critical issues impacting urban environments at a variety of scales from local to global. Introduces the role of urban planning in managing and building sustainable urban environments.

http://catalog.ecu.edu/preview_program.php?catoid=4&poid=718

Urban and Regional Planning, BS

Jerry Weitz, Program Director, A-215 Brewster Building

Students entering the Planning Program are encouraged to declare their major as soon as possible in accordance with university requirements. Minimum degree requirement is 120 s.h. of credit as follows:

1. Foundations curriculum requirements - 42 s.h.

(For information about courses that carry foundations curriculum credit see Liberal Arts Foundations Curriculum.)

- COMM 2410 - Public Speaking or
- COMM 2420 - Business and Professional Communication

2. Core - 33 s.h.

- GEOG 2400 - Spatial Data Analysis or
- MATH 2228 - Elementary Statistical Methods I or
- MATH 2283 - Statistics for Business

- PLAN 2410 - Fundamentals of GIS
- PLAN 3020 - Environmental Planning
- PLAN 3021 - Introduction to Planning Techniques
- PLAN 3022 - History and Theory of Planning
- PLAN 3030 - Urban and Regional Planning
- PLAN 3031 - Quantitative Analysis in Planning
- PLAN 3032 - Planning Legislation and Administration
- PLAN 4003 - Urban Form and Design
- PLAN 4096 - Planning Studio
•  PLAN 4099 - Practicum in Planning

3. Area of emphasis - 9 s.h.

(In consultation with the planning advisor, choose one area from the following.)

Coastal Planning and Development

•  PLAN 4015 - Emergency Management Planning
•  PLAN 4045 - Environmental Resources Planning and Management or
•  PLAN 4065 - Land Use Planning
•  PLAN 4055 - Coastal Area Planning and Management

Community Planning and Development:

•  PLAN 4025 - Housing and Neighborhood Planning
•  PLAN 4040 - Community Facilities Planning or
•  PLAN 4065 - Land Use Planning
•  PLAN 4075 - Transportation Planning or
•  PLAN 5985 - Historic Preservation Planning

4. Electives

(Choose any additional 6 s.h. from the following)

•  PLAN 1900 - Planning for the Human Environment Sustainable Cities
•  PLAN 3018 - Planning Internship *
•  PLAN 3028 - Planning Internship *
•  PLAN 3038 - Planning Internship *
•  PLAN 3041 - Computer Applications in Planning
•  PLAN 3430 - Geographic Information Systems I
•  PLAN 4015 - Emergency Management Planning
•  PLAN 4025 - Housing and Neighborhood Planning
•  PLAN 4040 - Community Facilities Planning
•  PLAN 4045 - Environmental Resources Planning and Management
- PLAN 4046 - Planning and Design Studio
- PLAN 4050 - World Architecture and Urbanism
- PLAN 4055 - Coastal Area Planning and Management
- PLAN 4065 - Land Use Planning
- PLAN 4075 - Transportation Planning
- PLAN 4121 - Problems in Planning
- PLAN 4131 - Problems in Planning
- PLAN 4270 - Water Resources Management and Planning
- PLAN 4305 - Ecological Landscape Planning
- PLAN 4430 - Geographic Information Systems II
- PLAN 5985 - Historic Preservation Planning

Note:

*May count a maximum of 3 s.h. from PLAN 3018, PLAN 3028, PLAN 3038 toward the degree.

5. Minor or concentration area - 24 s.h.

(In consultation with the planning advisor, choose a minor from another discipline or two concentration areas from below, with a minimum of 9 s.h. chosen from each of the two areas.)

Coastal Resources:

- BIOL 3400 - Biological Field Studies of the Coastal Plain
- BIOL 3401 - Biological Field Studies of the Coastal Plain Laboratory
- COAS 2025 - Survey of Coastal and Marine Resources
- COAS 4025 - Society and the Sea Seminar
- GEOG 4220 - Coastal Geography
- GEOG 4440 - Coastal Applications of GIS
- GEOG 4540 - Coastal Storms
- GEOL 1550 - Oceanography
- GEOL 3700 - Advanced Oceanography
- HIST 5520 - Maritime History of the Western World Since 1815
- SOCI 3410 - Introduction to Maritime Sociology

Community Health:

- ANTH 3027 - Human Health and Disease Ecology
- EHST 2110 - Introduction to Environmental Health Sciences
• EHST 3600 - Air Pollution
• EHST 5800 - Solid and Hazardous Waste Management and Laboratory
• EHST 5801 - Solid and Hazardous Waste Management and Laboratory
• GEOG 4340 - Introduction to Medical Geography
• HLT 2000 - Principles of Public Health
• HLT 3050 - Public Health Systems and Policy
• SOCI 3327 - Introductory Medical Sociology

Environmental Resources:

• ANTH 2005 - Environmental Anthropology
• ECON 3855 - Environmental Economics
• GEOG 2350 - Climate Change: Science and Society
• GEOG 3220 - Soil Properties, Surveys, and Applications
• GEOG 3250 - Environmental Hazards
• GEOG 3420 - Remote Sensing of the Environment I
• GEOG 3500 - Hydrogeology and the Environment
• POLS 3256 - Environmental Politics

Geographic Information Science:

• GEOG 3420 - Remote Sensing of the Environment I
• GEOG 3430 - Geographic Information Systems I
• GEOG 3450 - Introduction to the Global Positioning System
• GEOG 3460 - GIS Applications Programming
• GEOG 4410 - Advanced Cartographic Design and Production
• GEOG 4420 - Remote Sensing II
• GEOG 4430 - Geographic Information Systems II
• GEOG 4440 - Coastal Applications of GIS
• GEOG 4450 - GIScience, Society and Technology
• GEOG 4460 - Digital Terrain Analysis

International Development:

• ECON 3353 - Development Economics
• ECON 3750 - Economics of Poverty and Discrimination
• GEOG 2003 - Geography in the Global Economy
• GEOG 2110 - World Geography: Less Developed Regions
• GEOG 4325 - Resources, Population, and Development
• POLS 3140 - Politics of Globalization
• POLS 3257 - International Environmental Policy
- POLS 3297 - International Political Economy
- POLS 4360 - Politics of Developing Areas

Recreation:

- GEOG 2019 - Geography of Recreation
- GEOG 4335 - Geography of Tourism
- RCLS 2000 - Foundations of Recreation, Parks, and Tourism Studies
- RCLS 2601 - Leisure in Society
- RCLS 3104 - Public and Non-Profit Recreation
- RCLS 3120 - Commercial Recreation and Tourism
- RCLS 3300 - Outdoor Recreation Programming
- RCLS 4111 - Recreation and Park Planning

Rural Development:

- ANTH 4260 - Cultural Ecology
- ECON 3750 - Economics of Poverty and Discrimination
- GEOG 3055 - North Carolina
- GEOG 4325 - Resources, Population, and Development
- GEOG 4335 - Geography of Tourism
- HIST 3100 - North Carolina History
- HIST 3300 - History of American Rural Life
- SOCI 3222 - Rural Sociology

Public Administration:

- ECON 4214 - Public Finance
- MGMT 3202 - Fundamentals of Management
- POLS 3240 - State and Local Government
- POLS 3241 - Urban Political Systems
- POLS 3242 - Municipal Policy and Administration
- POLS 3252 - Public Administration
- POLS 3253 - Government Fiscal Administration

Urban Studies:

- EHST 3600 - Air Pollution
- GEOG 3004 - Urban Geography
• GEOG 4560 - Urban Climatology
• HIST 3205 - History of American Urban Life
• POLS 3241 - Urban Political Systems
• POLS 3242 - Municipal Policy and Administration
• SOCI 3225 - Urban Sociology
• SOCI 3289 - Community Organization

6. Electives to complete degree requirements for graduation.

Note:

Excluding foundations curriculum requirements, no one course may be used to fulfill two or more degree requirements.

http://catalog.ecu.edu/preview_program.php?catoid=4&poid=719

Planning Minor

The planning minor 24 s.h. of credit as follows:

1. Core - 15 s.h.

• PLAN 1900 - Planning for the Human Environment: Sustainable Cities
• PLAN 3020 - Environmental Planning
• PLAN 3021 - Introduction to Planning Techniques
• PLAN 3030 - Urban and Regional Planning
• PLAN 3032 - Planning Legislation and Administration

2. PLAN Electives - 9 s.h.
Religious Studies Minor

Religious studies is a nonsectarian and interdisciplinary program designed to provide students with an understanding of religion as historical and cultural phenomena. Courses offered explore religion in its various dimensions – aesthetic, anthropological, ethical, historical, literary, philosophical, political, psychological, and sociological. The religious studies minor requires 24 s.h. credit. The major advisor should send a potential minor to the director for advising. Requirements for the minor are listed below. A maximum of 6 s.h. may be used to satisfy foundations curriculum requirements and requirements for the religious studies minor. No course work in the student's major field of study will be accepted for credit toward the minor. Study abroad programs having the prior approval of the director will be accepted for a maximum 6 s.h. of credit toward the minor. Additional courses beyond those listed below will be accepted if they significantly further the student's understanding of religion; prior approval by the director is required for additional courses. Departmental prerequisites may be waived in special cases by the department offering the course.

Multidisciplinary Studies Major

A multidisciplinary studies major with a structured concentration in religious studies is available. Interested students should contact the director of religious studies, Dr. Calvin Mercer (300C Brewster Building or mercerc@ecu.edu), for more information.

The minimum requirements for the minor are 24 s.h. as follows:

1. Core - 6 9 s.h.

- RELI 1000 - Introduction to Religious Studies or
- RELI 1690 - World Religions

- RELI 4500 - Religious Studies Seminar
- 3500 - Methodology of Religious Studies
- RELI 4800 - Religious Studies Seminar II
- 4500 - Religious Studies Seminar
2. Electives - 18 15 s.h.

Choose a minimum of 15 12 s.h. from core religion electives and the remaining electives from either list of electives.

Core Religion Electives:

(Minimum of 15 s.h.)

- ANTH 4054 - Anthropology of Religion
- ENGL 3630 - The Bible as Literature
- ENGL 3640 - Literature and Religion
- HIST 3412 - A History of Christianity to 1300
- HIST 3413 - A History of Christianity 1300-present
- HIST 3627 - History of Japanese Buddhism
- HIST 5360 - The Reformation, 1450-1598
- PHIL 1290 - Introduction to Philosophy of Religion
- PHIL 3290 - Philosophy of Religion
- PSYC 3314 - Psychology of Religion
- RELI 1000 - Introduction to Religious Studies
- RELI 1690 - World Religions
- RELI 2340 - Religion and Science
- RELI 2350 - Religion and Sexuality
- RELI 2400 - Religion and Film
- RELI 2500 - Study Abroad
- RELI 2691 - Classical Islam
- RELI 2692 - Buddhism
- RELI 2693 - Hinduism
- RELI 2694 - Indigenous Religions
- RELI 2695 - Introduction to the Old Testament
- RELI 2696 - Introduction to the New Testament
- RELI 3000 - Motherhood of God in Asian Traditions
- RELI 3113 - Archaeology of the Old Testament World
- RELI 3114 - Archaeology of the New Testament World
- RELI 3500 - Methodology of Religious Studies
- RELI 3600 - Greek and Roman Religions
- RELI 3690 - Women and Religion
- RELI 3691 - Islam in the Modern World
- RELI 3692 - Tibetan Religion and Culture
- RELI 3694 - Religions of Africa
- RELI 3698 - Mysticism
- RELI 3700 - Religion and Social Issues
- RELI 3796 - Paul and His Letters
- RELI 3800 - Religion and Violence
- RELI 3896 - Life and Teachings of Jesus
- RELI 3930 - Directed Readings in Religious Studies
- RELI 4699 - Special Topics in Religious Studies
- SOCI 4341 - Sociology of Religion

http://catalog.ecu.edu/content.php?filter%5B27%5D=RELI&filter%5B29%5D=&filter%5Bcourse_type%5D=-1&filter%5Bkeyword%5D=&filter%5B32%5D=1&filter%5Bcpage%5D=1&cur_cat_oid=4&expand=&navoid=257&search_database=Filter&filter%5Bexact_match%5D=1

RELI 2340 – Religion and Science

3 FC: HU

History, current models, and contemporary debates in the conversation about religion and science.

RELI 2350 – Religion and Sexuality

3 FC: HU

Explores religious views of human sexuality, particularly the influence of various religious teachings on sexual formation, practice, identity, gender, rituals, and general behavior.

Agenda Item VIII.
College of Fine Arts and Communication
School of Theatre and Dance

http://catalog.ecu.edu/preview_program.php?catoid=4&poid=813

1. Foundations curriculum including six hours from those listed below - 42 s.h.
(For information about courses that carry foundations curriculum credit see *Liberal Arts Foundations Curriculum*)

- ENGL 3330 - Early Twentieth-Century Drama
- ENGL 3340 - Contemporary Drama
- ENGL 4070 Shakespeare: Histories 3 credit hours
- ENGL 4080 Shakespeare: Comedies 3 credit hours.
- ENGL 4090 Shakespeare: Tragedies 3 credit hours

4. **Theatre Electives - 12 s.h.**

*(Any THEA course, except THEA 1000.)*

(Choose from the following)

- THEA 2004 - Introduction to Theatrical Properties
- THEA 2010 - Professional Acting Technique I
- THEA 2020 - Professional Acting Technique II
- THEA 3005 - Scenery Design II
- THEA 3010 - Professional Acting Technique III
- THEA 3018 - Movement for Actors II: Physical Characterization
- THEA 3020 - Professional Acting Technique IV
- THEA 3025 - Intermediate Voice and Articulation
- THEA 3050 - Advanced Acting I
- THEA 3019 - Stage Combat: Rapier and Dagger
- THEA 4003 - Advanced Stage Lighting
- THEA 4018 - Stage Combat: Broadsword and Quarterstaff
- THEA 4040 - Directing I
- THEA 4065 - Stage Management

**Agenda Item IX.**

**College of Education**

**Department of Business and Information Technologies Education**

http://catalog.ecu.edu/preview_entity.php?catoid=4&ent_oid=312&returnto=256

**BITE 2123 - Early Experiences for the Prospective Teacher**

1 F

Minimum of 16 hours of directed observations and planned participation in appropriate school environments and 8 hours of seminar class instruction in the teaching area. For prospective teachers. Minimum of 8 hours of focused observations and planned participation in appropriate school and virtual environments. Eight hours of seminar.
class instruction in the teaching area. Introduces teaching of business, marketing, and career and technology education.

BITE 4323 - Methods of Teaching Career and Technical Education
3 F
P: BITE 4400 and Admission to upper division. Methodology related to student’s special interest areas. Topics include planning for instruction, group and individualized instructional techniques and strategies, instructional materials development and utilization, community resources utilization, and evaluating student progress.

BITE 4324 - Internship in Career and Technical Education
10 S
Full-time, semester-long internship. P: Admission to upper division; C: BITE 4325. Internship in assigned career and technical education public school classroom.

BITE 4400 - Administration and Supervision Teaching and Administration of Career and Technical Education
3 S, SS
P: BITE 2123, admission to upper division or consent of program director. Teaching and administration in career and technical education programs. Organization, administration, and supervision of career and technical education programs. Topics include organization of career and technical education curricula, classrooms and programs, career pathways, instructional strategies commonly employed in teaching CTE, and management of student co-curricular organizations. History of career and technical education programs, school-to-work transition programs, management of youth organizations, and career and technical education curricula.

Business Education, BSBE

See Licensure. Minimum degree requirement is 126 s.h. of credit as follows:

1. Foundations curriculum and special requirements for certification including those listed below - 42 s.h.

(For information about courses that carry foundations curriculum credit see Liberal Arts Foundations Curriculum)

- ART 1910 - Art Appreciation or
- MUSC 2208 - Music Appreciation
- ECON 2113 - Principles of Microeconomics
- HIST 1050 - American History to 1877 or
- HIST 1051 - American History Since 1877

- MATH 1065 - College Algebra or
- MATH 1066 - Applied Mathematics for Decision Making

- PSYC 1000 - Introductory Psychology
- PSYC 3206 - Developmental Psychology
- Choose a literature course (FC:HU)
- Choose a speech course (FC:FA)

2. Professional studies - 24 s.h.

- BITE 2123 - Early Experiences for the Prospective Teacher
- BITE 4324 - Internship in Career and Technical Education
- BITE 4325 - Internship Seminar: Issues in Career and Technical Education
- EDUC 3002 - Introduction to Diversity
- EDUC 3200 - Foundations of American Education

- EDUC 4400 - Foundations of School Learning, Motivation, and Assessment or
- PSYC 4305 - Educational Psychology

- READ 3990 - Teaching Reading in the Content Areas in the Secondary School
- SPED 4010 - Effective Instruction in Inclusive Classrooms

3. Common core - 48 s.h.

- BITE 2212 - Basic Programming for Business Applications
- BITE 2311 - Financial Information Systems I
- BITE 2500 - Electronic Information Processing II
- BITE 3200 - Distribution Technology I: Merchandising
- BITE 3220 - Business Communications
- BITE 3228 - Administrative Management
- BITE 3311 - Financial Information Systems II
- BITE 3500 - Electronic Information Processing III
- BITE 4200 - Microcomputer Business Applications
- BITE 4323 - Methods of Teaching Career and Technical Education
- BITE 4390 - Consumer Financial Management
- BITE 4400 - Administration and Supervision: Teaching and Administration of Career and Technical Education
- BITE 4500 - Information Processing Systems Design
- BITE 4700 - Web Site Design and Maintenance
- FINA 2244 - Legal Environment of Business
• MATH 2228 - Elementary Statistical Methods I or
• MATH 2283 - Statistics for Business

4. Academic concentration - 18 s.h.

(See Academic Concentrations. A maximum of 6 s.h. may be counted toward foundations curriculum requirements.) Business information education concentration recommended

5. Electives to complete requirements for graduation.

http://catalog.ecu.edu/preview_program.php?catoid=4&poid=783

Business and Marketing Education, BSBE

See Licensure. Minimum degree requirement is 128 s.h. of credit as follows:

1. Foundations curriculum and special requirements for certification including those listed below - 42 s.h.

(For information about courses that carry foundations curriculum credit see Liberal Arts Foundations Curriculum)

• ART 1910 - Art Appreciation or
• MUSC 2208 - Music Appreciation

• ECON 2113 - Principles of Microeconomics

• HIST 1050 - American History to 1877 or
• HIST 1051 - American History Since 1877

• MATH 1065 - College Algebra or
• MATH 1066 - Applied Mathematics for Decision Making

• PSYC 1000 - Introductory Psychology
• PSYC 3206 - Developmental Psychology
• Choose a literature course (FC:HU)
• Choose a speech course (FC:FA)

2. Professional studies - 24 s.h.

- BITE 2123 - Early Experiences for the Prospective Teacher
- BITE 4324 - Internship in Career and Technical Education
- BITE 4325 - Internship Seminar: Issues in Career and Technical Education
- EDUC 3002 - Introduction to Diversity
- EDUC 3200 - Foundations of American Education
- EDUC 4400 - Foundations of School Learning, Motivation, and Assessment or
- PSYC 4305 - Educational Psychology
- READ 3990 - Teaching Reading in the Content Areas in the Secondary School
- SPED 4010 - Effective Instruction in Inclusive Classrooms

3. Common core - 51 s.h.

- BITE 2212 - Basic Programming for Business Applications
- BITE 2311 - Financial Information Systems I
- BITE 2500 - Electronic Information Processing II
- BITE 3200 - Distribution Technology I: Merchandising
- BITE 3220 - Business Communications
- BITE 3228 - Administrative Management
- BITE 3301 - Distribution Technology II: Promotion
- BITE 3302 - Distribution Technology III: Selling
- BITE 3311 - Financial Information Systems II
- BITE 4200 - Microcomputer Business Applications
- BITE 4323 - Methods of Teaching Career and Technical Education
- BITE 4390 - Consumer Financial Management
- BITE 4400 - Administration and Supervision Teaching and Administration of Career and Technical Education
- BITE 4500 - Information Processing Systems Design
- BITE 4700 - Web Site Design and Maintenance
- FINA 2244 - Legal Environment of Business

- MATH 2228 - Elementary Statistical Methods I or
- MATH 2283 - Statistics for Business

4. Academic concentration - 18 s.h.

(See Academic Concentration. A maximum of 6 s.h. may be counted toward foundations curriculum requirements.)
Business information technologies concentration recommended

5. Electives to complete requirements for graduation.

Agenda Item X.
Thomas Harriot College of Arts and Sciences
Department of Mathematics

http://catalog.ecu.edu/preview_entity.php?catoid=4&ent_oid=294&returnto=256

MATH 2153 - Engineering Calculus III

3 F FC:MA

3 lecture hours per week. May not receive credit for MATH 2153 after receiving credit for MATH 2173. P: MATH 2152 with a minimum grade of C (2.0) or MATH 2172 with a minimum grade of C (2.0) or consent of instructor. Fundamentals of vector functions and multivariable calculus including partial derivatives, multiple integrals, and vector calculus. Includes applications to engineering problems such as motion in space, and force fields.

MATH 2172 - Calculus II

4 F,S,SS FC:MA

P: MATH 2171 with a minimum grade of C- (1.7) or MATH 2122 with consent of instructor. Second of three-course sequence. Transcendental functions, applications of integrals, techniques of integration, and infinite series.

MATH 2300 - Transition to Advanced Mathematics
3 WI

P: MATH 2152 with a minimum grade of C- (1.7) or MATH 2171 with a minimum grade of C- (1.7). Proof methods including induction, naïve set theory, functions and relations, cardinality, basic number theory, completeness of the real number system.

MATH 3256 - Linear Algebra

3 F,S,SS

P: MATH 2152 with a minimum grade of C- (1.7) or MATH 2172 with a minimum grade of C- (1.7). Vector spaces, linear maps, matrices, systems of equations, determinants, and eigenvalues.

MATH 3263 - Introduction to Modern Algebra

3 WI F,S

P: MATH 2300, 3256. Postulation viewpoint of modern algebra. Defining postulates for mathematical system exhibited from which properties of system are derived. Principal systems studied are groups, rings, fields, each fully treated with illustrative examples. A development of group theory. Topics include cyclic and symmetric groups, Lagrange's Theorem, quotient groups, the First Isomorphism Theorem and applications to basic number theory.

MATH 4005 - Introduction to Sampling and Experimental Design

3 F

P: MATH 2228 or MATH 2283 or MATH 3308 or equivalent, or consent of instructor. Fundamental principles of survey sampling. Data sources and types, survey design, sampling schemes, and statistical analysis. Fundamental principles of experimental design.

MATH 4101 - Advanced Calculus I

3 F,S

May receive credit for one of MATH 4101, MATH 5101. P: MATH 2153 with a minimum grade of C- (1.7) or MATH 2173 with a minimum grade of C- (1.7), and MATH 2300 with a minimum grade of C- (1.7); or consent of instructor. Axioms of real number system,
completeness, sequences, infinite series, power series, continuity, uniform continuity, differentiation, Riemann integral, and Fundamental Theorem of Calculus.

MATH 4110 - Elementary Complex Variables

3

P: MATH 2153 with a minimum grade of C- (1.7) or MATH 2173 with a minimum grade of C- (1.7). Complex numbers, analytic functions, mapping by elementary functions, integrals, residues, and poles.

MATH 4331 - Introduction to Ordinary Differential Equations

3 F,S

P: MATH 2153 with a minimum grade of C- (1.7) or MATH 2173 with a minimum grade of C- (1.7). Linear and nonlinear differential equations.

MATH 5000 - Introduction to Sampling Design

3 F

P: MATH 3308 or MATH 3229 or consent of instructor. Fundamental principles of survey sampling. Data sources and types, questionnaire design, various sampling schemes, sampling and nonsampling errors, and statistical analysis.
MATHEMATICS, BA

Credit toward a mathematics major will not be given in any MATH course or in CSCI 2310, CSCI 2311 with a grade less than C- (1.7). The degree offers two concentration areas: mathematics and statistics. The mathematics concentration requires a minor and the statistics concentration requires specified cognates in lieu of a minor. Minimum degree requirement is 126 s.h. of credit as follows:

1. **Foundations curriculum - 42 s.h.**

(For information about courses that carry foundations curriculum credit see *Liberal Arts Foundations Curriculum.*)

2. **Foreign language through level 1004 - 12 s.h.**

3. **Common core - 30 s.h.**

- MATH 2171 - Calculus I
- MATH 2172 - Calculus II
- MATH 2173 - Calculus III
- MATH 2300 - Transition to Advanced Mathematics
- MATH 3256 - Linear Algebra
- MATH 3263 - Introduction to Modern Algebra
- MATH 3307 - Mathematical Statistics I
- MATH 4101 - Advanced Calculus I
- MATH 4331 - Introduction to Ordinary Differential Equations

4. **Cognate - 4 s.h.**

- CSCI 2310 - Algorithmic Problem Solving and Programming Laboratory
- CSCI 2311 - Algorithmic Problem Solving and Programming Laboratory

5. **Concentration area to include minor or specified cognates as listed below. - 31–40 27 – 36 s.h.**

(Choose one area.)

**Mathematics - 30-36 s.h.:**
Choose 6 s.h. of MATH electives numbered above 2999, excluding MATH 3229, MATH 3237, MATH 3239

Minor (24-30 s.h.)

Statistics - 27 s.h.: 

Choose 9 s.h. of MATH electives numbered above 2999, excluding MATH 3229 , MATH 3237 , MATH 3239 , and excluding cognates listed below.

Excluding the cognates below, choose 9 s.h. of electives from

- ECON 3343 - Econometrics
- ECON 4430 - Business Cycles and Forecasting
- MATH courses numbered above 2999
- OMGT 4493 - Quality Management

Note: MATH 3229, MATH 3237, MATH 3239 may not count toward statistics electives.

Cognates (18 s.h.):

- CSCI 5774 - Programming for Research
- MATH 3308 - Mathematical Statistics II
- MATH 4005 - Introduction to Sampling and Experimental Design
- MATH 5031 - Applied Statistical Analysis
- MATH 4031 - Applied Statistical Analysis
- MATH 4201 - Introduction to Stochastic Processes
- MATH 4774 - Programming for Research
- MATH 5801 - Probability Theory
- MATH 4801 - Probability Theory

Choose 6 s.h. from:

- ECON 3343 - Econometrics
- ECON 4430 - Business Cycles and Forecasting
- MATH 4201 - Introduction to Stochastic Processes
- MATH 5000 - Introduction to Sampling Design
- MATH 5132 - Probabilistic Methods in Operations Research
- OMGT 4493 - Quality Management

6. Electives to complete requirements for graduation.
MATHEMATICS, BS

Credit toward a mathematics major will not be given in any MATH course with a grade less than C- (1.7). Minimum degree requirement is 126 s.h. of credit as follows:

1. Foundations curriculum - 42 s.h.

(For information about courses that carry foundations curriculum credit see Liberal Arts Foundations Curriculum.)

2. Common mathematics core - 37 s.h.

- MATH 2171 - Calculus I
- MATH 2172 - Calculus II
- MATH 2173 - Calculus III
- MATH 2300 - Transition to Advanced Mathematics
- MATH 3256 - Linear Algebra
- MATH 3263 - Introduction to Modern Algebra
- MATH 3307 - Mathematical Statistics I
- MATH 3308 - Mathematical Statistics II
- MATH 4101 - Advanced Calculus I
- MATH 4331 - Introduction to Ordinary Differential Equations
- CSCI 2310 - Algorithmic Problem Solving and Programming Laboratory
- CSCI 2311 - Algorithmic Problem Solving and Programming Laboratory

3. Concentration area - 13-33 s.h.

(Choose one area.)

Mathematics - 27-33 s.h.:

- MATH 4110 - Elementary Complex Variables
- Minor (24-30 s.h.)
Science - 27-28 s.h.

- CHEM 1150 - General Chemistry I
- CHEM 1151 - General Chemistry Laboratory I
- CHEM 1160 - General Chemistry II
- CHEM 1161 - General Chemistry Laboratory II
- MATH 4110 - Elementary Complex Variables
- PHYS 2350 - University Physics
- PHYS 2360 - University Physics

Choose one of the following:

- BIOL 1100 - Principles of Biology I
- BIOL 1101 - Principles of Biology I Laboratory
- and
- BIOL 1200 - Principles of Biology II
- BIOL 1201 - Principles of Biology II Laboratory
- A combination of any 3 courses numbered above 1999 in Chemistry or numbered above 3999 in Physics.

Statistics - 24 18 s.h.

- ENGL 3880 - Writing for Business and Industry
- MATH 4005 - Introduction to Sampling and Experimental Design
- MATH 4031 - Applied Statistical Analysis
- MATH 4100 - Mathematics of Risk Analysis or
- MATH 4300 - Financial and Actuarial Mathematics
- MATH 4201 - Introduction to Stochastic Processes
- MATH 4201 - Introduction to Stochastic Processes or
- MATH 5000 - Introduction to Sampling Design
- MATH 4774 - Programming for Research
- MATH 4801 - Probability Theory
- MATH 4999 - Capstone and Statistical Consulting
- PHIL 2274 - Business Ethics

Computer Science - 13 s.h.

- CSCI 2410 - Digital Electronics or
- EENG 2410 - Digital Electronics
- or


• CSCI 3675 - Organization of Programming Language
  or
• MATH 4110 - Elementary Complex Variables

• CSCI 3300 - Introduction to Algorithms and Data Structures
• CSCI 3310 - Advanced Data Structures and Data Abstraction
• CSCI 3650 - Analysis of Algorithms

4. Specified electives

Mathematics - 9 s.h.:

Choose 9 additional s.h. in consultation with advisor from

• MATH 3174 - Vector Calculus
• MATH 3233 - College Geometry
• MATH 3273 - Combinatorics
• MATH 3301 - Foundations of Geometry
• MATH 3573 - Introduction to Numerical Analysis
• MATH 4005 - Introduction to Sampling and Experimental Design
• MATH 4100 - Mathematics of Risk Analysis
• MATH 4201 - Introduction to Stochastic Processes
• MATH 4264 - Introduction to Modern Algebra II
• MATH 4300 - Financial and Actuarial Mathematics
• MATH 4801 - Probability Theory
• MATH 5000 - Introduction to Sampling Design
• MATH 5002 - Logic for Mathematics and Computer Science
• MATH 5021 - Theory of Numbers I
• MATH 5102 - Advanced Calculus II
• MATH 5121 - Numerical Analysis in One Variable
• MATH 5122 - Numerical Analysis in Several Variables
• MATH 5131 - Deterministic Methods in Operations Research
• MATH 5132 - Probabilistic Methods in Operations Research
• MATH 5311 - Mathematical Physics
• MATH 5322 - Foundations of Mathematics
• MATH 5551 - The Historical Development of Mathematics

Science - 3 s.h.

Choose 3 additional s.h. in consultation with advisor from

• MATH 3174 - Vector Calculus
- MATH 3233 - College Geometry
- MATH 3273 - Combinatorics
- MATH 3301 - Foundations of Geometry
- MATH 3573 - Introduction to Numerical Analysis
- MATH 4005 - Introduction to Sampling and Experimental Design
- MATH 4100 - Mathematics of Risk Analysis
- MATH 4201 - Introduction to Stochastic Processes
- MATH 4264 - Introduction to Modern Algebra II
- MATH 4300 - Financial and Actuarial Mathematics
- MATH 4801 - Probability Theory
- MATH 5000 - Introduction to Sampling Design
- MATH 5002 - Logic for Mathematics and Computer Science
- MATH 5021 - Theory of Numbers I
- MATH 5102 - Advanced Calculus II
- MATH 5121 - Numerical Analysis in One Variable
- MATH 5122 - Numerical Analysis in Several Variables
- MATH 5131 - Deterministic Methods in Operations Research
- MATH 5132 - Probabilistic Methods in Operations Research
- MATH 5311 - Mathematical Physics
- MATH 5322 - Foundations of Mathematics
- MATH 5551 - The Historical Development of Mathematics

**Statistics - 9 12 s.h.**

**Choose 3 additional s.h. from**

Choose 12 s.h. of electives from

- ECON 3343 - Econometrics
- ECON 4430 - Business Cycles and Forecasting
- MATH courses numbered above 2999
- OMGT 4493 - Quality Management

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**Note:** MATH 3229, MATH 3237, MATH 3239 may not count toward statistics electives.
Choose 6 additional s.h. from

- MATH 3174 - Vector Calculus
- MATH 3233 - College Geometry
- MATH 3273 - Combinatorics
- MATH 3301 - Foundations of Geometry
- MATH 3573 - Introduction to Numerical Analysis
- MATH 4100 - Mathematics of Risk Analysis
- MATH 4110 - Elementary Complex Variables
- MATH 4264 - Introduction to Modern Algebra II
- MATH 4300 - Financial and Actuarial Mathematics
- MATH 5002 - Logic for Mathematics and Computer Science
- MATH 5021 - Theory of Numbers I
- MATH 5102 - Advanced Calculus II
- MATH 5121 - Numerical Analysis in One Variable
- MATH 5122 - Numerical Analysis in Several Variables
- MATH 5131 - Deterministic Methods in Operations Research
- MATH 5132 - Probabilistic Methods in Operations Research
- MATH 5311 - Mathematical Physics
- MATH 5322 - Foundations of Mathematics
- MATH 5551 - The Historical Development of Mathematics

Computer Science - 15 s.h.

Choose 3 s.h. from

- MATH 3174 - Vector Calculus
- MATH 3233 - College Geometry
- MATH 3273 - Combinatorics
- MATH 3301 - Foundations of Geometry
- MATH 3573 - Introduction to Numerical Analysis
- MATH 4005 - Introduction to Sampling and Experimental Design
- MATH 4100 - Mathematics of Risk Analysis
- MATH 4201 - Introduction to Stochastic Processes
- MATH 4264 - Introduction to Modern Algebra II
- MATH 4300 - Financial and Actuarial Mathematics
- MATH 4801 - Probability Theory
- MATH 5000 - Introduction to Sampling Design
- MATH 5002 - Logic for Mathematics and Computer Science
- MATH 5021 - Theory of Numbers I
- MATH 5102 - Advanced Calculus II
- MATH 5121 - Numerical Analysis in One Variable
Choose 12 s.h. of

- CSCI electives numbered above 1999
- CSCI 2310 - Algorithmic Problem Solving and Programming Laboratory
- CSCI 2311 - Algorithmic Problem Solving and Programming Laboratory
- CSCI 2610 - Introduction to Computer Science II and Laboratory
- CSCI 2611 - Introduction to Computer Science II and Laboratory
- CSCI 3300 - Introduction to Algorithms and Data Structures
- CSCI 3310 - Advanced Data Structures and Data Abstraction
- CSCI 3510 - Data Structures
- CSCI 3584 - Computational Linear Algebra
- CSCI 3601 - Computer Organization and Programming
- CSCI 3650 - Analysis of Algorithms

5. Electives to complete requirements for graduation.

http://catalog.ecu.edu/preview_program.php?catoid=4&poid=750&returnto=209

Statistics Minor

(Not open to majors in Mathematics)

Minimum requirement for statistics minor is 26 s.h. of credit as follows:
1. Core - 23 s.h.

- CSCI 5774 - Programming for Research
- MATH 2171 - Calculus I
- MATH 2172 - Calculus II
- MATH 3256 - Linear Algebra
- MATH 3307 - Mathematical Statistics I
- MATH 3308 - Mathematical Statistics II
- MATH 5031 - Applied Statistical Analysis
- MATH 4031 - Applied Statistical Analysis
- MATH 4774 - Programming for Research

2. Electives - 3 s.h.

(Choose from the following.)

- ECON 3343 - Econometrics
- ECON 4430 - Business Cycles and Forecasting
- MATH 4005 - Introduction to Sampling and Experimental Design
- MATH 4100 - Mathematics of Risk Analysis
- MATH 4201 - Introduction to Stochastic Processes
- MATH 4300 - Financial and Actuarial Mathematics
- MATH 5031 - Applied Statistical Analysis
- MATH 5132 - Probabilistic Methods in Operations Research
- MATH 5801 - Probability Theory
- MATH 4801 - Probability Theory
- OMG 4493 - Quality Management

Agenda Item XI.
College of Technology and Computer Science
Department of Engineering


O. Hayden Griffin, Chair, 214 Slay Building

The Department of Engineering offers a BS in engineering with five concentration areas: biomedical engineering, bioprocess engineering, electrical engineering, industrial and systems engineering, and mechanical engineering. The
BS in engineering program is accredited by the Engineering Accreditation Commission of ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012, telephone: 410-347-7700.

The mission of the department is to provide a theory-based, application-oriented general engineering education that serves as a basis for career success and lifelong learning. Our graduates demonstrate the engineering and scientific knowledge to analyze, design, improve and evaluate integrated technology-based systems. Our program welcomes a diverse student body and provides the support to foster its success.

Graduates of the BS in engineering program will:

1. Use their education to be successful in a technical career or graduate studies, demonstrating competence in applying classical methods and modern engineering tools;
2. Analyze technical, environmental, and societal issues related to engineering designs and technology systems;
3. Be productive team members and leaders, using skills in human relations and communication;
4. Practice a lifelong commitment to learning and professional development; and
5. Demonstrate commitment to the professional and ethical standards of engineering and recognize the importance of community and professional service.

Graduates of the BS program have: (a) an ability to apply knowledge of math, science and engineering; (b) an ability to design and conduct experiments/analyze and interpret data; (c) an ability to design a system, component, or process; (d) an ability to function on multi-disciplinary teams; (e) an ability to identify, formulate, and solve engineering problems; (f) an understanding of professional and ethical responsibility; (g) an ability to communicate effectively; (h) an ability to evaluate the impact of technology in a global/societal context; (i) an appreciation for lifelong learning; (j) knowledge of contemporary issues; (k) an ability to use the techniques, skills, and modern tools for engineering practice; and (l) an ability to apply engineering concepts to an area of concentrated study, chosen from biomedical engineering, bioprocess engineering, electrical engineering, industrial and systems engineering, or mechanical engineering.

The BS program is distinctive from many other engineering programs in that it: 1) focuses on hands-on project applications of engineering, beginning with the freshman year and continuing throughout the program; 2) promotes a team-based learning approach where students work closely with each other and the faculty; and 3) integrates science, math and engineering content to assure a coordinated presentation of concepts that flow from theory to advanced practice and application.

Engineering students are encouraged to pursue registration as a Professional Engineer (PE). The first step in this process is completion of the Fundamentals of Engineering (FE) Exam. Students are encouraged to take the FE exam during their senior year. Subsequent to graduation, professional licensure requires at least four years of progressive engineering experience and successful completion of the PE Examination.

Admission

Admission to the university or college does not guarantee admission to the engineering program. Students with an interest in engineering should indicate engineering as the desired major when they apply to the university and complete a separate application to the engineering program. The engineering application can be found on the Department of Engineering Web site at www.tecs.ecu.edu/engineering www.ecu.edu/tecs/engineering. Once students have been accepted into the university, the engineering admissions committee evaluates program applicants based on a number of success indicators including SAT/ACT scores, performance in math and science courses, high school GPA, and rank in class. The average SAT for freshmen admitted to the engineering program at ECU is typically over 1100 on mathematics and critical reading. Prior to enrolling in classes, engineering students...
also take an engineering mathematics placement test focused on calculus readiness. Information on this test is included in the engineering acceptance letter.

Transfer admission: Students transferring to the engineering program must first meet university transfer requirements. Once transfer students have been admitted to the university, they may apply to the engineering program and will be evaluated by the department admissions committee on their potential to succeed with particular emphasis on performance in math and science classes. Students who have completed an associate’s degree from an approved pre-engineering program will be directly admitted to the BS program.

Special Department Programs

Cooperative Education. Students in the industrial and systems and mechanical engineering concentrations may request to participate in the cooperative education (co-op) program that alternates semesters of engineering work and academic enrollment. Co-op students earn money during their periods of employment and also learn how their coursework relates to engineering activities. Furthermore, they have an opportunity to experience different areas of engineering during their co-op work periods. To be eligible for the engineering co-op program, students must have declared a major in engineering, completed a minimum of 24 s.h. including ENGR 1000, ENGR 1012, ENGR 1014 or ENGR 1016, ENGR 2050, and MATH 2152, and have earned a minimum major and overall cumulative GPA of 2.5. Additional Eligibility requirements and availability of co-op placements can be obtained from the academic advisor. Interested students should apply for a co-op through the ECU Career Center.

Internships. All engineering students are encouraged to complete internships, service learning projects, and professional practice activities prior to graduation. The department maintains a number of internship relationships at local and regional employers. Full-time students who have completed 24 credit hours and have a 2.5 minimum cumulative GPA are eligible for these ECU internships. Transfer students must complete 12 credit hours at ECU before applying for the internship program.

Engineering Learning Community. Incoming freshmen are encouraged to live in the engineering learning community dormitory on campus. This program builds teamwork and collaboration skills and facilitates the transition to university life.

Undergraduate Research. Students are strongly encouraged to pursue undergraduate research with a faculty member. Up to 3 s.h. of undergraduate research may be applied toward degree requirements as a technical elective. Information regarding undergraduate research may be obtained from the concentration coordinator.

Transfer Program. The engineering department evaluates transfer credits on a course-by-course basis. Transfer students who have received credit for courses equivalent to ENGR 1000 and ENGR 1012 may be placed in ENGR 1014 in lieu of taking the traditional pathway through ENGR 1016 and ENGR 2000. Students may not receive credit for both ENGR 1014 and either ENGR 1016 or ENGR 2000.

Programs

Bachelor's
- Engineering, BS

Courses

Biomedical Engineering
- BIME 2080 - Foundations of Biomedical Engineering
- BIME 4030 - Biomechanics and Materials
- BIME 4040 - Physiological Systems and Modeling for Engineering
BIME 4050 - Physiological Systems and Modeling for Engineering II
BIME 4200 - Biomedical Instrumentation

**Bioprocess Engineering**

- BIOE 3016 - Engineering Applications in Microbial Systems
- BIOE 3250 - Bioprocess Engineering Systems
- BIOE 4006 - Bioprocess Engineering Validation and Quality
- BIOE 4010 - Bioprocess Separation Engineering
- BIOE 4020 - Bioprocess Plant Design, Simulation and Analysis

**Electrical Engineering**

- EENG 2410 - Digital Electronics
- EENG 3020 - Signals and Systems
- EENG 3040 - Microprocessors
- EENG 3530 - Electronics
- EENG 3750 - Electric Power Systems
- EENG 4510 - Advanced Control System Design

**Engineering Core**

- ENGR 1000 - Introduction to Engineering
- ENGR 1002 - Fundamentals of Engineering Practice
- ENGR 1012 - Engineering Graphics
- ENGR 1014 - Introduction to Engineering
- ENGR 1016 - Introduction to Engineering Design
- ENGR 2000 - Engineering Design and Project Management I
- ENGR 2022 - Statics
- ENGR 2050 - Computer Applications in Engineering
- ENGR 2070 - Materials and Processes
- ENGR 2450 - Dynamics
- ENGR 2514 - Circuit Analysis
- ENGR 3000 - Engineering Design and Project Management II
- ENGR 3012 - Thermal and Fluid Systems
- ENGR 3013 - Introduction to Engineering Management
  - **ENGR 3014 - Circuit Analysis**
- ENGR 3024 - Mechanics of Materials
- ENGR 3050 - Sensors, Measurements, and Controls
  - **ENGR 3060 - System Optimization**
- ENGR 3100 - Internship in Engineering
- ENGR 3400 - Engineering Economics
- ENGR 3420 - Engineering Economics
- ENGR 3500 - Introduction to Engineering Project Management
- ENGR 3800 - Quality Control for Engineers
- ENGR 3901 - Undergraduate Research in Engineering
- ENGR 3902 - Undergraduate Research in Engineering
- ENGR 3903 - Undergraduate Research in Engineering
- ENGR 4010 - Senior Capstone Design Project I
- ENGR 4020 - Senior Capstone Design Project II
- **ENGR 4033 - Entrepreneurship and Intellectual Property**
- ENGR 4501 - Special Topics in Engineering
- ENGR 4502 - Special Topics in Engineering
- ENGR 4503 - Special Topics in Engineering
BIME 2080 - Foundations of Biomedical Engineering

2 S FormerlyFormerly BIME 3000

1 lecture and 3 lab hours per week. P: ENGR 2050 or consent of instructor. Application of fundamental engineering skills to solve problems in medicine and biology. Introduces students to a wide range of state-of-the-art applications in biomedical engineering and promotes understanding of interdisciplinary nature of the field.

BIME 4040 - Physiological Systems and Modeling for Engineering I

3 F

3 lecture hours per week. P: BIME 2080 or consent of instructor. Quantitative approach to human physiology from the biomedical engineering perspective with emphasis on cellular, neural, endocrine and musculoskeletal systems. Introduction to numerical simulation of physiologic processes and simple control/feedback systems.
BIME 4050 - Physiological Systems and Modeling for Engineering II

3 S

3 lecture hours per week. P: BIME 4040 or consent of instructor. Quantitative approach to human physiology from the biomedical engineering perspective with emphasis on cardiovascular, pulmonary, renal and gastrointestinal systems. Applied numerical simulation of physiologic processes and control/feedback systems.

EENG 2410 - Digital Electronics

3 Same as CSCI 2410.

3 lecture hours per week. P: ENGR 1014 or ENGR 1016 and ENGR 2050; or CSCI 2310, CSCI 2311. Introduction to digital logic and digital electronics, including Boolean algebra, number systems, logic gates, data structures, and both combinational and sequential logical design and optimization.

EENG 3020 - Signals and Systems

3

3 lecture hours per week. P: ENGR 2514; MATH 2154. Singularity functions, properties of LTI systems, and differential and difference equation representation of physical systems. Convolution, Fourier series, Fourier Transforms, Laplace transforms, and z-transforms. Applications in sampling, modulation, filtering, and digital signal processing, with relevant examples in electrical, mechanical, and biomedical engineering.

EENG 3530 - Electronics

3

3 lecture hours per week. P: ENGR 2514 with minimum grade of 2.0. Fundamentals of operational amplifiers and common topologies; PN junctions, semiconductor physics, the ideal diode, and real diodes; bipolar junction transistors (BJTs) and metal oxidized silicon field-effect transistors (MOSFETs): physical structures, signal models, common configurations, and second-order effects.

EENG 3750 - Electric Power Systems

3

3 lecture hours per week. P: ENGR 2514. Alternating current (AC) systems, single-phase and three-phase systems, transformers, electric machinery, electric power generation, transmission lines, and power system faults.

EENG 4510- Advanced Controls Control System Design

3

3 lectures per week. P: EENG 3020; ENGR 3050. Difference equations and Z-transforms; sampling of continuous-time systems; transfer functions in Z-domain and discrete-time system models; control system performance and stability analysis in Z-domain; digital controller design and implementation. Modeling, analysis, and design of control systems: time response and stability of dynamic systems; root locus and frequency response design; transfer functions in Z-domain and discrete-time system models; control system performance and stability in Z-domain; digital-controller design and implementation.

ENGR 1012 - Engineering Graphics
1 lecture and 2 lab hours per week. P: Declared engineering major; P/C: MATH 1083 or MATH 2151 or MATH 2171. Engineering graphics in a professional engineering context, including sketching and working drawings, multiple views, sections, solid modeling software, drawing standards, tolerancing, and dimensioning.

ENGR 1014 - Introduction to Engineering and Design

3

1 lecture and 4 lab hours per week. P: ENGR 1000; ENGR 1012. Transfer students who receive credit for ENGR 1000. May not receive credit for ENGR 1016 and ENGR 2000. Engineering profession and basic tools and concepts of engineering, providing immersive and hands-on experience in engineering practice areas, including professional practice, systems thinking, and basics concepts in machinery, controls, digital circuits, and data analysis.

ENGR 1016 - Introduction to Engineering Design

2

2 two-hour labs per week. P: ENGR 1000, ENGR 1012. May not receive credit for ENGR 1014. Engineering design process including developing design requirements and constraints, determining feasible solutions, evaluating alternative solutions and testing implementing the best dilution. Utilizes case studies and hands-on micro-processor and robotic based design problems in a team environment.

ENGR 2000 - Engineering Design and Project Management I

1

2 lecture hours per week. P: ENGR 1016 or consent of instructor. May not receive credit for ENGR 1014. Continuation of ENGR 1016. Historical engineering achievements, focusing on the design process and project management issues; engineering failures, emphasizing the impacts on the engineering profession and society; and contemporary issues facing society, focusing on the role of engineering solutions.

ENGR 2022 - Statics

3

3 lecture hours per week. P: MATH 2152 with minimum grade of C (2.0) or MATH 2172 with minimum grade of C (2.0); P/C: PHYS 2350. Analysis of equilibrium of particles, addition and resolution of forces, equivalent system of forces, equilibrium of rigid bodies, centroid and moment of inertia, structural analysis, internal forces, friction, and virtual work.

ENGR 2050 - Computer Applications in Engineering

3

2 lecture and 2 lab hours per week. P: Declared engineering major; C:-MATH 1083 or MATH 2151 or MATH 2171. Application of modern programming tools and languages to solve engineering problems.
ENGR 2070 - Materials and Processes

3 WI

2 lecture and 2 lab hours per week. P: CHEM 1150; ENGL 1200. Study of the materials used in engineering and related manufacturing processes. Materials topics include the atomic structure of materials, alloys, phase diagrams, and heat treatment. Manufacturing processes include casting, forming, machining, and joining processes.

ENGR 2450 - Dynamics

3 SFFormerly ENGR 3004.

3 lecture hours per week. P: ENGR 2022 with minimum grade of C (2.0); MATH 2152 or MATH 2172. Fundamental topics in particle and rigid body dynamics. Planar kinematics of a particle. Planar kinetics of a particle: force and acceleration, work and energy, and impulse and momentum. Planar kinematics of a rigid body.

ENGR 3000 - Engineering Design and Project Management II

2 WI

1 lecture and 2 lab hours per week. P: ENGR 2000. P/C: ENGR 3420. Integration of engineering design and project management. Employs example project to demonstrate the steps of engineering design, develop a project plan, project presentation, and design report with supporting documents.

ENGR 3013ENMA-3000 - Introduction to Engineering Management

3 Formerly ENMA 3000

3 lecture hours per week. P: ENGR 2000 Consent of instructor. Introduces principles of management and organization as applicable to engineering profession. Special emphasis on project management, systems engineering and analysis, team building, quality leadership, planning, and quantitative decision making. Includes topic exercises, case studies, and extensive writing assignments.

ENGR 3014 - Circuit Analysis

3-

2 lecture and 2 lab hours per week. P: MATH 2153; PHYS 2360. Electrical and electronic engineering concepts, theory, and methods. Includes electric circuit analysis, electro mechanics, and electrical instrumentation systems.

ENGR 3060 - System Optimization

3-

P: MATH 3100, MATH 3307. Introduces mathematical tools applied to system optimization, including problem formulation, identification of decision variables, use of graphical methods, linear programming, concepts of duality, and sensitivity analysis. Applications include transportation, network analysis, project management and other engineering areas.

ENGR 3420 - Engineering Economics
2 lecture hours per week. P: MATH 2152 with minimum grade of C (2.0) or MATH 2172 with minimum grade of C (2.0). Analysis of cash flows including cost, revenue, and benefits that occur at different times. Evaluation of engineering projects using equivalent worth, benefit-cost, and rate of return including impact of depreciation, and taxes.

**ENGR 3800 - Quality Control for Engineers**

3 Formerly ENGR 4000.

3 lecture hours per week. P: MATH 3307. Analytical procedures associated with Statistical Quality and Process Control. Includes design of experiments, and system approaches to maintenance and improvement of process quality.

**ENGR 4010 - Senior Capstone Design Project I**

2 WI

1 lecture and 2 lab hours per week. P: ENGR 3000; ENGR 3420; BIOE 3016, BIOE 3250 or BIME 2080, BIME 4040 or EENG 2410, EENG 3520 or ISYS 3010 or MENG 3070, MENG 3624; minimum GPA 2.0 in the major; minimum cumulative GPA 2.0; consent of instructor. Senior capstone course involves open-ended design project, exposing students to practice of engineering design and problem solving. Emphasis on real problems and working with real clients. Students required to visit facilities, interact with client employees, determine on-site data measurement strategies, and perform any necessary literature search. Develop proposal for project to be performed in ENGR 4020.

**ENGR 4033 ENMA 4010 - Entrepreneurship and Intellectual Property**

3 Formerly ENMA 4010


**ENGR 4510 - Practice of Professional Engineering I**

1

2 lab hours per week. P/C: ENGR 4010, ENGR 4020, or consent of instructor. Problem analysis and review of topics related to the fundamentals of engineering exam and professional practice. Covers topics such as statics and dynamics.

**ENMA 4020 – Analysis of Production Systems**

3-S

P: MATH 3307. Tools and approaches for design and analysis of production systems. Covers strategy, aggregate planning, inventory, location, layout and production control systems.

**ISYS 3010 - Principles and Methods of Industrial and Systems Engineering**

3 Formerly SYSE 3010

3 lecture hours per week. P: ENGR 2000. Junior standing in engineering. Systems engineering methodologies, and processes; conceptual system design; testing; design review; multiple criteria design decisions; and design for
reliability. Introduces engineering management and organization principles, team building, leadership, motivation, and quantitative decision making.

**ISYS 3060 - Systems Optimization**

3 Formerly SYSE 3060

2 lecture and 2 lab hours per week. P: MATH 2154, MATH 3307. Mathematical tools applied to system optimization: problem formulations, identification of decision variables, use of graphical methods, linear programming, duality, and sensitivity analysis. Applications include transportation analysis, network analysis, project management, decision analysis, and production planning.

**ISYS 4010 - Work Measurement and Human Factors**

3 Formerly SYSE 4010

3 lecture hours per week. P: ENGR 3800 MATH 3307. Work place design and analysis: Human information processing, motor skills, hand tool designs, biomechanics, and work related injuries. Work measurement, motion analysis, human interface design and response.

**ISYS 4065 - Discrete Systems Modeling**

3 Formerly SYSE 4065

3 lecture hours per week. P: ENGR 3800. Simulation with emphasis on discrete event models. Model building, data integration, verification and validation, statistical analysis of simulation results, and applications to engineering problems.

**ISYS 4203 SYSE 4000 - Integrated Systems Engineering**

3 S

3 lecture hours per week. P: ISYS SYSE 3010. Explores life cycle of systems; generation and analysis of life cycle requirements and development of functional, physical, and operational architectures for the allocation and derivation of component-level requirements for the purpose of specification production. Examines interfaces and development of interface architectures. Introduces and uses software tools for portions of systems engineering cycle.

**ISYS 4303 ENMA 4030 - Engineering Logistics**

3 S Formerly ENMA 4030

3 lecture hours per week. P: MATH 3307. Logistics from systems engineering perspective. Covers design of systems for supportability and serviceability, production and effective distribution of systems for customer use, and sustaining maintenance and support of systems throughout their period of utilization.

**ISYS 4410 - Lean and Six-Sigma Quality Systems for Engineers**

3

3 lecture hours per week. P: ENGR 3800. Six-sigma quality and lean productivity systems and related statistical and analytical tools. Includes advanced topics in design of experiments, quality control, sampling plans, measurement systems, and data analysis.

**MENG 3070 - Thermodynamics I**
3 lecture hours per week. P: ENGR 2450 with minimum grade of C (2.0); MATH 2154. Thermodynamic properties and tables. First and second law analysis for open systems and control volumes. Ideal and real gases and mixtures of gases, availability, irreversibility, and exergy.

**MENG 3624 - Solid Mechanics**

3

3 lecture hours per week. P: ENGR 3024. Analysis of structures including static and fatigue, failure criteria, column buckling, statically indeterminate structures, impact loading, and the finite element method.

**MENG 4018 - Thermodynamics II**

3

3 lecture hours per week. P: MENG 3070. Engineering applications involving ideal gas mixtures, psychrometrics, real gas mixtures, power cycles, refrigeration systems, pumps, heat exchangers, boilers, combustion, dissociation and chemical equilibrium.

**MENG 4260 - Heat and Mass Transfer**

3

3 lecture hours per week. P: ENGR 3012 or MENG 3070. Three fundamental modes of heat transfer: conduction, convection and radiation, and mass transfer.

**MENG 4343 – Composite Materials**

3

3 lecture hours per week. P: ENGR 3024 with minimum grade of C (2.0). Mechanical behavior of fiber-reinforced composite materials. Topics include anisotropic stress-strain relationships, failure theories, stress analysis of laminated plates and shells, manufacturing methods, and applications.

**MENG 4650 - Machine Design**

3

3 lecture hours per week. P: ENGR 2450, ENGR 3024. Kinematics of mechanisms and machines. Design and analysis of machine components, including shafts, gears, bearings.

**SYSE 3010 – Principles and Methods of Systems Engineering**

3-E

P: Consent of instructor. Systems engineering foundations, methodologies and processes, limitations for complex systems, “design for” criteria of complex systems, human factors, interoperability and system architecture, planning, risk analysis, management, and organization for performing systems engineering.

**SYSE 3040 – Introduction to Dynamic Systems and Controls**

3-S

P: ENGR 3060; MATH 3100. Covers application of mathematical and analytical tools to analyze and design automated control systems for dynamic systems. Topics include block diagrams, transfer functions, stability, time response, frequency domain analysis, and other topics required to design control systems for physical systems.
SYSE 3060 – System Optimization

3-F

3 lecture hours per week. P: MATH 2154, MATH 3307. Introduces mathematical tools applied to system optimization, including problem formulation, identification of decision variables and constraints, use of graphical methods, linear programming, concepts of duality, and sensitivity analysis. Applications include transportation, network analysis, project management and other engineering areas.

SYSE 4010 – Human-Machine Systems: Design and Analysis

3-F

3 lecture hours per week. P: MATH 3307; SYSE 3010; or consent of instructor. Introduces measurement, evaluation, implementation, communication, equipment, and data for developing and implementing human/machine/environment systems in industrial and consumer contexts. Explores techniques to assess visual, auditory, cognitive, and physical capabilities of individuals. Emphasizes systems approach, with a special interest in the human/machine interface. Explores interaction of environment and individual to enable designers and/or managers to reduce errors, increase productivity, and enhance both safety and comfort, while performing tasks.

SYSE 4065 – Discrete System Simulation

3-S

P: MATH 3307. Approaches to computer simulation models, with special emphasis on discrete event simulation. Covers model building, data integration, model verification and validation, and applications to engineering and management problems.