Florida Gulf Coast University Board of Trustees  
June 21, 2005

SUBJECT: New Degree Proposal: Bachelor of Science (B.S.) in Athletic Training

PROPOSED BOARD ACTION
Approve new B.S. in Athletic Training and transfer limited access status from the existing Athletic Training Concentration of the B.S. in Human Performance to the new degree program.

BACKGROUND INFORMATION
FGCU is requesting permission to offer a B.S. in Athletic Training as described in the Executive Summary. Further, FGCU is requesting that the limited access status for the Athletic Training Concentration of the B.S. in Human Performance previously approved by the FGCU Board of Trustees and the Florida Board of Education be transferred to the new degree program.

Supporting Documentation Included: (1) Memo from Provost, and (2) Executive Summary of Degree Program

Legal Review by: N/A

Prepared by: Cathy Duff, Director of Program Development, Curriculum, and Accreditation

Submitted by: Provost Bonnie Yegidis
May 20, 2005

MEMORANDUM

TO: Trustee Larry Hart, Chair
    Academic/Student/Faculty Affairs Committee
    FGCU Board of Trustees

FROM: Bonnie L. Regidis
    Provost and Vice President for Academic Affairs

SUBJECT: Bachelor of Science (B.S.) in Athletic Training

The College of Health Professions is proposing the addition of a B.S. in Athletic Training. Approval of this proposal will elevate Athletic Training from a concentration (within the existing B.S. in Human Performance program) to a free-standing major. The change in program status is requested to address Committee on Accreditation of the Allied Health Education Programs (CAAHEP) standards for athletic training programs.

The program will be 120 semester credit hours in length and is designed to prepare students for careers that focus on evaluating, advising, and treating athletes of any type and of all ages. Areas of focus will include injury prevention, assessment of injury, and reconditioning. The program has been approved by the university-wide Undergraduate Curriculum Team and is consistent with the criteria for new degree authorization adopted by the Board of Governors on April 30, 2003.

The program will be supported by existing faculty in the College of Health Professions. At this time, only one faculty member is a Certified Athletic Trainer; therefore, one additional full-time, 12-month faculty member (a licensed and certified athletic trainer) will be necessary to meet CAAHEP accreditation standards and sustain the Athletic Training major. Funding for the new hire will come from 2005 enrollment growth funds.

Implementation of the B.S. in Athletic Training program will provide Southwest Florida with a high quality program that is consistent with the university’s mission and will serve an identifiable need. I recommend approval of this program.
FLORIDA GULF COAST UNIVERSITY

Executive Summary
New Program Proposal

Degree: Bachelor of Science (B.S)

Major: Athletic Training

College: Health Professions

Department: Physical Therapy

Anticipated Implementation Date: Fall 2005

Suggested CIP: 51.0913

Program Description

The College of Health Professions is proposing a conversion of athletic training from a concentration within the Human Performance major to a freestanding Bachelor of Science (B.S.) degree with a major in Athletic Training. The program will continue to be housed in the College’s Department of Physical Therapy and Human Performance. The change in program status is requested to adhere to the standard set by the Committee on Accreditation of Allied Health Education Programs (CAAHEP) for Athletic Training accreditation.

The proposed B.S. in Athletic Training is designed to prepare students for careers that focus on evaluating, advising, and treating athletes of any type and of all ages. Areas of focus include injury prevention, assessment of injury, and reconditioning. The preparation of students will include both the preventative and restorative aspects of movement science. The program will be 120 semester credit hours in length and can be completed in five semesters (full-time).

It is anticipated that the majority of instruction will be delivered in traditional classroom settings on the FGCU campus and through cooperative efforts with external agencies. Nontraditional delivery mechanisms including Internet-based courses will be offered when appropriate. The delivery method for each course is dependent on course content, faculty expertise, the needs and expertise of students, and available resources.

We are requesting transfer of limited access status from the Athletic Training concentration of the B.S. in Human Performance to the B.S. in Athletic Training, in
accordance with Rule 6C-6.001, Florida Administrative Code (competitive admission due to limited space or other resources, or due to higher standards).

Consistency with FGCU Mission and Strategic Plan

The proposed change from a concentration to a free standing program is in accord with the University’s founding mission, which includes a commitment to undergraduate education and to addressing the educational and healthcare needs of its service community. A goal of the Athletic Training program will be to foster the development of competent and caring providers of athletic training services who will be leaders and life-long learners in their professional endeavors. In addition, the program’s primary commitment will be to assist people of all ages and the communities in which they live to achieve optimal levels of well-being through preventive and restorative care. In order to deliver this high standard of care, graduates must be qualified to sit for certification. To accomplish this, FGCU must earn accreditation for CAAHEP. Earning and maintaining program accreditation is consistent with the ongoing priorities of FGCU.

Need and Demand

The Athletic Training program will address a current and growing demand by both consumers and organizations for education and credentialed professionals in the area of athletic training. Graduates of the B.S. Athletic Training program will be qualified to fill positions in both traditional settings (K-12 schools, colleges and universities, and recreational and professional sports teams) and nontraditional settings (physicians’ offices, orthopedic rehabilitation clinics, and hospitals). The American Medical Association has affirmed the need to have National Athletic Trainer’s Association Board of Certification (NATABOC) certified athletic trainers in all high school athletic programs. Eleven accredited Athletic Training Education Programs are currently offered at public and private institutions in the State of Florida. However, they will not meet the ongoing need for Certified Athletic Trainers in Southwest Florida.

Enrollment Projections

The student enrollment projections for the next five years of the program are based on CAAHEP accreditations standards. Initially, student enrollment is anticipated to be 16 per academic year based on a permanent faculty of two certified Athletic Trainers. It is estimated that enrollment will continue to increase as resources increase in the next five years.

Resources

Faculty in the Department of Physical Therapy and Human Performance and faculty who teach core courses in the College of Health Professions, who meet Southern Association of Colleges and Schools accreditation standards for undergraduate programs, will support the program. Only one Certified Athletic Trainer is currently on faculty. Therefore, one
additional full-time, 12-month faculty member (a licensed and certified athletic trainer) will be necessary to meet CAAHEP accreditations standards and sustain the Athletic Training major. Funding for the new hire will come from 2005 growth enrollment funds.

The university has adequate facilities and equipment to support the athletic training program including the College of Health Professions' Practice Center, laboratory space in the Whitaker and Ben Hill Griffin Buildings, Alico Arena's athletic training room and NCH Human Performance Lab. Equipment owned by the Department of Physical Therapy and Human Performance and the Department of Occupational Therapy and Community Health will be available to support the proposed program change. Existing items include anatomical models, exercise physiology assessment instruments, athletic training prevention and assessment tools and clinical assessment and intervention equipment. To allow for continued growth in the College of Health Professions, additional dedicated practice/lab space is anticipated to be available Fall 2005.

Faculty and administration in the College of Health Professions will seek external funding to complement and supplement existing state funds to enable the program to grow and expand, enhancing both the scope and quality of the academic program offered.
Athletic Training (BS)

Degree: Bachelor of Science
Major: Athletic Training
Department: Physical Therapy and Human Performance
Semester Hours Required for Degree: 120

The Bachelor of Science in Athletic Training is designed to prepare graduates for professional careers in athletic training. Graduates are prepared to assume leadership roles in the field, which deals with the care, prevention, and rehabilitation of injuries to the physically active.

The program includes extensive clinical education instruction. Students develop or improve their skills in the use of technology and become self-directed learners through the active learning format that characterizes the program—skills that aid them in being resourceful scholars and career-oriented professionals. Faculty are committed to providing an environment which accommodates a variety of learning styles, supports self-paced learning, and fosters success.

Program Accreditation
The Athletic Training Education Program has earned Candidacy status by the Joint Review Committee in Athletic Training. The program will submit a self-study requesting consideration for full accreditation in September of 2005. Qualifications necessary for earning NATA-BOC certification can be found at http://NATA.Org/Student/CertificationCourse.htm.
For further details, please contact the Department of Physical Therapy and Human Performance at 239-590-7530. For more information concerning the technical standards for admission, please refer to the Department’s website, www.fgcu.edu/chp/pt.

Admission Information
The Department of Physical Therapy and Human Performance conducts a competitive admissions process for students desiring to pursue a degree in Athletic Training. The following are the minimum requirements for admission to the athletic training program. Students are admitted into the program in the fall of each year. This is a limited access program. Qualified students are accepted on a space available basis. Application forms are available from the Department of Physical Therapy and Human Performance or on the Department’s website at www.fgcu.edu/chp/pt. For priority consideration, all application materials must be received by February 15th of the year in which entry is sought. Application materials received after February 15th will be considered on a space available basis. Admissions decisions are made based on materials and coursework completed at the time of the application.

Admission requirements include:
• Submission of a State University (SUS) common application for admission and satisfaction of all applicable university admission requirements.
• Submission of supplemental application materials for the Athletic Training major.
• Completion of a total of 50 hours observation in two different athletic training sites.
• At time of admission into Athletic Training program all prerequisite courses must be completed with a grade of C or better (a grade of C- or less is not acceptable). At time of application 19 hours of prerequisite course work must be completed.
• Grade point average calculated for all prerequisite courses of at least 3.00 (on a 0 to 4 scale).
• A minimum grade point average of 3.00 for the most recent 30 college credit hours.

General Education
Students are expected to complete 36 hours of approved general education coursework during the first two years of attendance (see the General Education section of the FGCU catalog). Some coursework can be used to satisfy both general education and common prerequisite requirements.

Common Prerequisites
- BSCx010C General Biology w/lab (4)
- BSCx093 Anatomy and Physiology I w/lab (4)
  Acceptable substitutes: PET 2320, ZOO 3733, PET 3301C, ZOO 3731, BSC 2085
- BSCx094C Anatomy and Physiology II w/lab (4)
  Acceptable substitutes: PET 2350, PCB 3703, PET 3302C, PCB 3702, PCB 3704, BSC 2086
- CHMx045C General Chemistry I w/lab (4)
  Acceptable substitutes: any Organic Chemistry course
- HUNx201 Human Nutrition (3)
  Acceptable substitutes: PETx361, PET 2014, HUN 2002
- PHYx053C College Physics I (4)
- PSYx012 General Psychology (3)
- STAx023 Statistics (3)

Health Professions Common Core
- IHS 3101 Shaping Health Care in the 21st Century (3)
- IHS 3203 Management and Leadership in Health Care Organizations (3)
- IHS 4504 Research Methods & Applications to Health Care Systems (3)
- IHS 4938 Senior Seminar (3)

Required Courses in the Major
- PHT 3109C Movement Science I (10)
- PHT 3293C Movement Science II (5)
- PET 3380C Applied Exercise Physiology (3)
PET 4285  Lifespan Development (2)
PET 4297  Sport and Exercise Psychology (3)
PET 4930  Preparation for Entering and Growing in the Profession (1)

Program Requirements
PET 3603C  Intro to Athletic Training (3)
PET 3613C  Athletic Training Practice I (3)
PET 3614C  Athletic Training Practice II (2)
PET 4619C  Athletic Training Practice III (4)
PET 4629C  Athletic Training Practice IV (4)
PET 4670  Clinical Practice I (3)
PET 4671  Clinical Practice II (2)

Additional Requirements
IDS 3920  University Colloquium (3)

Additional electives may be required to reach a minimum of 120 credit hours for the baccalaureate degree. See assigned program advisor for more information.

Expenses
In addition to typical FGCU student costs, the Athletic Training students can anticipate additional costs related to the following:
- Transportation
- Immunizations
- Liability insurance
- Criminal record background checks
- Laboratory and Clinical Uniforms
- Membership dues for professional organizations
- Additional program costs may occur.

Additionally, full-time clinical rotations occur during the second year of the program.
Florida Gulf Coast University Board of Trustees
June 21, 2005

SUBJECT: New Degree Proposal: Bachelor of Science (B.S.) in Bioengineering

PROPOSED BOARD ACTION

Approve new B.S. in Bioengineering.

BACKGROUND INFORMATION

FGCU is requesting permission to offer a B.S. in Bioengineering as described in the Executive Summary.

Supporting Documentation Included: (1) Memo from Provost, and (2) Executive Summary of Degree Program

Legal Review by: N/A

Prepared by: Cathy Duff, Director of Program Development, Curriculum, and Accreditation

Submitted by: Provost Bonnie Yegidis
May 20, 2005

MEMORANDUM

TO: Trustee Larry Hart, Chair
    Academic/Student/Faculty Affairs Committee
    FGCU Board of Trustees

FROM: Bonnie L. Vlach
    Provost and Vice President for Academic Affairs

SUBJECT: Bachelor of Science (B.S.) in Bioengineering

The School of Engineering is proposing the addition of a B.S. in Bioengineering. A primary goal of the program is to prepare students for employment in bioengineering positions in Southwest Florida. Students will also be prepared to pursue graduate or professional degrees, including medical or dental school with the completion of an additional course in general biology.

The proposed baccalaureate degree program is consistent with the criteria for new degree authorization adopted by the Board of Governors on April 30, 2003. The program will be 129 semester credit hours in length, and approval will be sought from the Board of Governors for exception to the 120 credit hour limit for baccalaureate degree programs. The additional credit hours are necessary to meet common course prerequisites for biomedical engineering programs and the criteria needed to achieve accreditation by the Accreditation Board for Engineering and Technology (ABET). The university-wide Undergraduate Curriculum Team has approved the program.

Six new faculty will be hired to meet the needs of the B.S. in Bioengineering as well as to help with the needs of the other engineering degree programs through common engineering courses. Approximately $31,600 will be needed initially with $86,600 needed annually to support library resource requirements for all three undergraduate engineering programs.

This program addresses a need to help diversify the economic base in Southwest Florida by providing a pool of workers who can help develop a sophisticated technological and research infrastructure. I recommend approval of this program.
Degree: Bachelor of Science (B.S.)

Major: Bioengineering

College: Business

School: Engineering

Anticipated Implementation Date: Fall 2005

Suggested CIP: 14.0501

Program Description:

The proposed Bachelor of Science in Bioengineering emphasizes the application of new technology to biomaterials, biomechanics, and biomedical tools and procedures. Students will learn how to solve problems associated with the interaction between living and non-living materials and systems.

The proposed curriculum requires a total of 129 credit hours and prepares students to be successful when taking the Fundamentals of Engineering Exam, the first step towards professional licensure in engineering. During the first 67 credit hours, students complete general education and common prerequisites. The curriculum also includes 56 credit hours of coursework in the major, a senior seminar, and the University Colloquium.

Within the context of bioengineering, the undergraduate curriculum, courses, organizations, and activities prepare graduates to:

- Apply knowledge of mathematics, science, and engineering,
- Design and conduct experiments, as well as to analyze and interpret data,
- Design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability,
- Function on multi-disciplinary teams,
- Identify, formulate, and solve engineering problems,
- Understand professional practices and ethical responsibility,
- Communicate effectively,
- Understand the impact of engineering solutions in a global, economic, environmental, and societal context,
- Recognize the need for and have the ability to engage in life-long learning, especially with regard to professional licensure,
- Understand contemporary issues, and
- Use the techniques, skills, and modern engineering tools necessary for engineering practice.

Implementation of the program is anticipated for fall 2005.

Consistency with FGCU’s Mission and Strategic Plan:

The B.S. in Bioengineering supports the position of Florida Gulf Coast University (FGCU) within the State University System as serving the higher education needs in one of the fastest growing areas of the nation – southwest Florida. The Mission of FGCU can be broadly characterized by achievement of national prominence in undergraduate education, fulfilling the academic, cultural, social, and career expectations of its constituents, while practicing and promoting environmental sustainability. FGCU’s mission emphasizes undergraduate education utilizing the latest technological tools and innovations in pedagogy in an active learning-centered environment. The proposed B.S. in Bioengineering seeks to attain national prominence and accreditation by the Accreditation Board for Engineering and Technology (ABET). FGCU’s guiding principles, which focus on learner needs, diversity, civic engagement, regional partnerships, interrelatedness of knowledge across disciplines, and systematic assessment, also align with goals specified by ABET. The proposed B.S. in Bioengineering relates directly to Florida Gulf Coast University Strategic Directives as follows:

1. “Strategic Directive 3 – Academic Programs. Promote nationally recognized undergraduate programs distinguished by student research and scholarship opportunities. Continue to provide applied Master’s degrees appropriate for the region, and begin exploration for doctorate programs aligned with state needs.”¹

The proposed B.S. in Bioengineering seeks accreditation by ABET.

2. “Strategic Directive 5 – Research and Service. Serve as an intellectual center for southwest Florida through research and service, while contributing to the economic growth, environmental sustainability, and cultural richness of the region.”²

The proposed B.S. in Bioengineering is designed to specifically address identified weaknesses in the southwest Florida economy. The 2003 Koch Report² stated that a scientific/engineering/medical science core is one of the factors that differentiates rapidly growing regions and states from others and that “the addition of engineering to the curriculum of FGCU is a very attractive idea if one wishes to add high technology employment and to have more middle to upper middle-income residents.” The proposed B.S. in Bioengineering will directly

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¹ Florida Gulf Coast University Strategic Plan for 2005-2010, pg. 7-8.
contribute to the economic growth and cultural richness of southwest Florida while making significant contributions to research and service.

Need and Demand:

Support for this program comes primarily from the 2000 Area Educational Program Needs Assessment Report conducted by MGT of America, which indicated widespread interest throughout southwest Florida for engineering courses. In addition, the 2003 Koch report\(^2\) reinforced the need for a school of engineering. The Koch Report also indicated that the top seven “high growth” occupations in the United States are computer or engineering related. Major economic development efforts in Southwest Florida center on diversifying the base of the economy to provide more science and technology jobs. According to this study, the majority of individuals in economic development interviewed by the Koch team indicated a central role in having a School of Engineering to fuel this diversification and growth of the area economy. The Koch report also stated that Southwest Florida was the largest Metropolitan Statistical Area (M.S.A.) without an accredited engineering program. In addition, a recent report in *Fortune*\(^3\) predicts that careers in bioengineering will be among the fastest growing top 20 and will grow by 27.8% by 2012.

Enrollment Projections:

It is predicted that 25 fulltime students will enroll in engineering in the fall of 2005 and that 11 of these will want to major in bioengineering. By year five, we anticipate having 312 engineering students with 140 of them majoring in bioengineering.

Resources:

There has been wide community support for establishing a School of Engineering at Florida Gulf Coast University for several years. The Whitaker Foundation is donating $5 million toward the new engineering building, which will be matched by the State of Florida, resulting in a $10 million fund for the new building. In addition, another donor has pledged a $5 million gift for engineering. The Florida legislature recently approved $2.2 million in operating funds to support the start-up years for the three engineering programs. A scholarship fund has already been established and 10 full scholarships have been awarded for 2005-2006. We are confident that other donors will continue to support both scholarships and other funding needs as they arise.

The Library Impact Statement addresses all three new programs in Engineering. Estimated start-up expenses include $10,000 for circulating works, $10,000 for reference books, $6,600 for journal subscriptions, and $5,000 for electronic resources (CRC’s EngNet Base subscription). Recurring annual costs are estimated at $5,000 for

circulating works, $5,000 for reference books, $6,600 for journal subscriptions and an ongoing subscription fee of $10,000 for electronic resources. In addition, a subject librarian for $45,000 plus 30% fringe benefits for a total of $60,000 will be required. No increase in indirect costs is anticipated.

Engineering majors will be taking upper level mathematics and science courses. The effect on enrollment in these courses is not expected to impact capacity before enrollment and growth funding is available from the State of Florida.

Thirteen faculty, in addition to the Founding Director, are needed to cover the requirements of the proposed engineering programs. Six of these will be hired in the area of bioengineering with one of these having a background in health sciences and engineering management. As enrollment in the engineering programs grows, additional full-time faculty may be needed in the future.
Bioengineering

Degree: Bachelor of Science (B.S.)
Major: Bioengineering
Concentrations: none
College: Business
School: Engineering
Semester Hours Required for Degree: 129

The Bachelor of Science in Bioengineering emphasizes the application of new technology to biomaterials, biomechanics, and biomedical tools and procedures. Students learn how to solve problems associated with the interaction between living and non-living materials and systems. Although the B.S. in Bioengineering is offered by the College of Business, it is a non-business degree.

Bioengineering students complete core courses common to all engineering majors as well as specialized courses in bioengineering. The program prepares students to be successful when taking the Fundamentals of Engineering Exam, the first step towards professional licensure in engineering. With the addition of another 4-credit general biology course, graduates will meet the pre-requisites for most medical schools.

Within the context of bioengineering, the undergraduate curriculum, courses, organizations, and activities prepare graduates to:
- Apply knowledge of mathematics, science, and engineering,
- Design and conduct experiments, as well as to analyze and interpret data,
- Design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability,
- Function on multi-disciplinary teams,
- Identify, formulate, and solve engineering problems,
- Understand professional practices and ethical responsibility,
- Communicate effectively,
- Understand the impact of engineering solutions in a global, economic, environmental, and societal context,
- Recognize the need for and have the ability to engage in life-long learning, especially with regard to professional licensure,
- Understand contemporary issues, and
- Use the techniques, skills, and modern engineering tools necessary for engineering practice.

Admission to the B.S. in Bioengineering
Admission to School of Engineering undergraduate programs is open to all students who have been accepted to Florida Gulf Coast University, are in good academic standing, and have completed the communications, mathematics through calculus II, chemistry, and first physics common prerequisite courses with a grade of C or higher. Students must submit an application for admission to the School of Engineering and declare a major.

General education (36 hours):
Students are expected to complete 36 credit hours of approved general education coursework during the first two years of study (refer to General Education Program). Some courses may meet general education requirements as well as fulfill common prerequisite or engineering common core requirements. Students are strongly encouraged to take ECO 2023 Principles of Micro Economics.

Common prerequisites (64 hours):
- Communications:
  & ENC X101 (3 cr.hr.) English I
  & ENC X102 (3) English II
- Mathematics:
  & MAC X311* (4) Calculus I w/Analytical Geometry
  & MAC X312* (4) Calculus II w/Analytical Geometry
  & MAC X313* (4) Calculus III w/Analytical Geometry
  & MAP X302 (3) Differential Equations
- Natural Sciences:
  & CHM X045/ X045L** (4) General Chemistry w/Lab I
  & PHY X048/ X048L (4) Physics w/Lab I
  & PHY X049/049L (4) Physics w/Lab II
  & CHM X046/ X046L** (4) General Chemistry w/Lab II
  & BSC X010/ X010L (4) General Biology w/Lab I
  & CHM X210/ X210L** (4) Organic Chemistry w/Lab I
  & CHM X211/ X211L** (4) Organic Chemistry w/Lab II
- Humanities & Social Sciences:
  & XXX XXXX (6) Humanities Courses
  & XXX XXXX (6) Social Science Courses
  & XXX XXXX (3) Humanities or Social Sciences

* Or MAC X281, MAC X282, MAC X283
** Or CHSX440 Chemistry for Engineers

Note: Students are encouraged to consult with School of Engineering advisors to identify FGCU courses that satisfy common prerequisite requirements.

Engineering common core (37 hours):
EGN 1006 Introduction to the Engineering Profession (1)
EGN 1930 Concepts and Methods (3)
EGN 2XXX Engineering Economic Analysis (2)
EGN 3310 Engineering Analysis – Statics (3)
EGN 3XXX Engineering Fluid Mechanics (3)
EGN 3XXX Mechanics of Solid Materials (3)
EEL 3003 Electrical Engineering I (3)
EGN 3XXX Service Learning for Engineers (2)
EGN 4XXX Senior Design I (2)
EGN 4XXX Senior Design II (3)
EGN 4XXX Engineering Entrepreneurship (3)
ENC 3XXX Technical Writing (3)
STA 2037 Statistics with Calculus (3)
IDS 3920 University Colloquium (3)

**Bioengineering major (28 hours):**
EGN 3321 Dynamics (3)
EGN 3XXX Biomaterials (3)
EGN 3XXX Human Physiology for Engineers I (3)
EGN 3XXX Human Physiology for Engineers II (3)
EGN 3XXX Signals and Systems (3)
EGN 3XXX Transport Phenomena (3)
EGN 4XXX Analysis of Design in Bioengineering (4)
EGN 4XXX Biomedical Instrumentation (3)
EGN 4XXX Biomechanics (3)
or EGN 4XXX Bioelectricity (3)

**Additional graduation requirements:**
- Grade of C or higher in the B.S. in Bioengineering common prerequisites, engineering common core, and major coursework.
- Overall grade point average of 2.0 in all coursework attempted at FGCU.
- Within the 129 total credit hours, a minimum of 48 credit hours at the upper division (courses numbered 3000 and higher).
- A minimum of 32 of the last 60 credit hours at FGCU, including 12 credit hours in the major.
- Satisfy the following requirements: CLAST, foreign language, and Gordon Rule writing and computation.
- Satisfy the Service learning requirement. Information is available at [www.fgcu.edu/connect/](http://www.fgcu.edu/connect/).
Florida Gulf Coast University Board of Trustees
June 21, 2005

SUBJECT: New Degree Proposal: Bachelor of Science in Civil Engineering (B.S.C.E)

PROPOSED BOARD ACTION

Approve new Bachelor of Science in Civil Engineering.

BACKGROUND INFORMATION

FGCU is requesting permission to offer a Bachelor of Science in Civil Engineering as described in the Executive Summary.

Supporting Documentation Included: (1) Memo from Provost, and (2) Executive Summary of Degree Program

Legal Review by: N/A

Prepared by: Cathy Duff, Director of Program Development, Curriculum, and Accreditation

Submitted by: Provost Bonnie Yegidis
May 20, 2005

MEMORANDUM

TO: Trustee Larry Hart, Chair
    Academic/Student/Faculty Affairs Committee
    FGCU Board of Trustees

FROM: Bonnie L. Vegidis
    Provost and Vice President for Academic Affairs

SUBJECT: Bachelor of Science in Civil Engineering (B.S.C.E)

The School of Engineering is proposing the addition of a Bachelor of Science in Civil Engineering. A primary goal of the program is to prepare students for employment in civil engineering positions in Southwest Florida, with particular emphasis on general civil engineering, structural engineering, water resources, environmental engineering, and geotechnical engineering, and to prepare students to be successful when taking the Fundamentals of Engineering Exam, the first step towards professional licensure as a civil engineer.

The proposed baccalaureate degree program is consistent with the criteria for new degree authorization adopted by the Board of Governors on April 30, 2003. The program will be 128 semester credit hours in length, and approval will be sought from the Board of Governors for exception to the 120 credit hour limit for baccalaureate degree programs. The additional credit hours are necessary to meet common course prerequisites for civil engineering programs and the criteria needed to achieve accreditation by the Accreditation Board for Engineering and Technology (ABET). The university-wide Undergraduate Curriculum Team has approved the program.

Four new faculty will be hired to meet the needs of the B.S.C.E. program as well as to help with the needs of the other engineering degree programs through common engineering courses and with the needs of the B.S. in Environmental Engineering in terms of courses in soil mechanics and solid and hazardous waste management. Approximately $31,600 will be needed initially with $86,600 needed annually to support library resource requirements for all three undergraduate engineering programs.

The increasing need for growth management and municipal planners throughout Southwest Florida has spurred the call for additional civil engineers. I recommend approval of the proposed program.
FLORIDA GULF COAST UNIVERSITY

Executive Summary
New Program Proposal

Degree: Bachelor of Science in Civil Engineering (B.S.C.E.)

Major: Civil Engineering

College: Business

School: Engineering

Anticipated Implementation Date: Fall 2005

Suggested CIP: 14.0801

Program Description:

The proposed Bachelor of Science in Civil Engineering (B.S.C.E.) provides integrated coverage of general civil engineering, structural engineering, water resources, environmental engineering, and geotechnical engineering.

The proposed curriculum requires a total of 128 credit hours and prepares students to be successful when taking the Fundamentals of Engineering Exam, the first step towards professional licensure in civil engineering. During the first 51 credit hours, students complete general education and common prerequisites. The curriculum also includes 71 credit hours of coursework in the major, a senior seminar, and the University Colloquium.

Within the context of civil engineering, the undergraduate curriculum, courses, organizations, and activities prepare graduates to:

- Apply knowledge of mathematics, science, and engineering,
- Design and conduct experiments, as well as to analyze and interpret data,
- Design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability,
- Function on multi-disciplinary teams,
- Identify, formulate, and solve engineering problems,
- Understand professional practices and ethical responsibility,
- Communicate effectively,
- Understand the impact of engineering solutions in a global, economic, environmental, and societal context,
- Recognize the need for and have the ability to engage in life-long learning,
especially with regard to professional licensure,
- Understand contemporary issues, and
- Use the techniques, skills, and modern engineering tools necessary for engineering practice.

Implementation of the program is anticipated for fall 2005.

Consistency with FGCU’s Mission and Strategic Plan:

The B.S. in Civil Engineering supports the position of Florida Gulf Coast University (FGCU) within the State University System as serving the higher education needs in one of the fastest growing areas of the nation – southwest Florida. The Mission of FGCU can be broadly characterized by achievement of national prominence in undergraduate education, fulfilling the academic, cultural, social, and career expectations of its constituents, while practicing and promoting environmental sustainability. FGCU’s mission emphasizes undergraduate education utilizing the latest technological tools and innovations in pedagogy in an active learning-centered environment. The proposed B.S.C.E. seeks to attain national prominence and accreditation by the Accreditation Board for Engineering and Technology (ABET). FGCU’s guiding principles, which focus on learner needs, diversity, civic engagement, regional partnerships, interrelatedness of knowledge across disciplines, and systematic assessment, also align with goals specified by ABET. The proposed B.S.C.E. relates directly to Florida Gulf Coast University Strategic Directives as follows:

1. “Strategic Directive 3 – Academic Programs. Promote nationally recognized undergraduate programs distinguished by student research and scholarship opportunities. Continue to provide applied Master’s degrees appropriate for the region, and begin exploration for doctorate programs aligned with state needs.”
   The proposed B.S.C.E. seeks accreditation by ABET.

2. “Strategic Directive 5 – Research and Service. Serve as an intellectual center for southwest Florida through research and service, while contributing to the economic growth, environmental sustainability, and cultural richness of the region.”
   The proposed B.S.C.E. is designed to specifically address identified weaknesses in the southwest Florida economy. A 2000 Area Educational Program Needs Assessment Report conducted by MGT of America stated that there was widespread interest throughout SW Florida for civil (environmental), electrical, mechanical, agricultural, and possibly computer engineering courses. In addition, the report said that the increasing need for growth management and municipal planners throughout the region spurred the need for additional civil engineers. The 2003 Koch Report stated that a scientific/engineering/medical science core is one of the factors that differentiates rapidly growing regions and

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1 Florida Gulf Coast University Strategic Plan for 2005-2010, pg. 7-8.
states from others and that "the addition of engineering to the curriculum of FGCU is a very attractive idea if one wishes to add high technology employment and to have more middle to upper middle-income residents." The proposed B.S.C.E. will directly contribute to the economic growth and cultural richness of southwest Florida while making significant contributions to research and service.

Need and Demand:

Support for this program comes primarily from the 2000 Area Educational Program Needs Assessment Report conducted by MGT of America indicating widespread interest throughout southwest Florida for civil (environmental), electrical, mechanical, agricultural and possibly computer engineering courses. The report said that the growing needs for growth management and municipal planners throughout the region spurs the need for additional civil engineers. In addition, the 2003 Koch report reinforced the need for a school of engineering. The Koch Report also indicated that the top seven "high growth" occupations in the United States are computer or engineering related. Major economic development efforts in Southwest Florida center on diversifying the base of the economy to provide more science and technology jobs. According to this study, the majority of individuals in economic development interviewed by the Koch team indicated a central role in having a School of Engineering to fuel this diversification and growth of the area economy. The Koch report also stated that Southwest Florida was the largest Metropolitan Statistical Area (M.S.A.) without an accredited engineering program.

Enrollment Projections:

It is predicted that 25 fulltime students will enroll in engineering in the fall of 2005 and that 10 of these will want to major in civil engineering. By year five, we anticipate having 312 engineering students with 125 of them majoring in civil engineering.

Resources:

There has been wide community support for establishing a School of Engineering at Florida Gulf Coast University for several years. The Whitaker Foundation is donating $5 million toward the new engineering building, which will be matched by the State of Florida, resulting in a $10 million fund for the new building. In addition, another donor has pledged a $5 million gift for engineering. The Florida legislature recently approved $2.2 million in operating funds to support the start-up years for the three engineering programs. A scholarship fund has already been established and 10 full scholarships have been awarded for 2005-2006. We are confident that other donors will continue to support both scholarships and other funding needs as they arise.
The Library Impact Statement addresses all three new programs in Engineering. Estimated start-up expenses include $10,000 for circulating works, $10,000 for reference books, $6,600 for journal subscriptions, and $5,000 for electronic resources (CRC's EngNet Base subscription). Recurring annual costs are estimated at $5,000 for circulating works, $5,000 for reference books, $6,600 for journal subscriptions and an ongoing subscription fee of $10,000 for electronic resources. In addition, a subject librarian for $45,000 plus 30% fringe benefits for a total of $60,000 will be required. No increase in indirect costs is anticipated.

Engineering majors will be taking upper level mathematics and science courses. The effect on enrollment in these courses is not expected to impact capacity before enrollment and growth funding is available from the State of Florida.

Thirteen faculty, in addition to the Founding Director, are needed to cover the requirements of the proposed engineering programs. Four of these will be hired in the area of civil engineering with one of these having a background in construction management. Two additional faculty to be hired in environmental engineering will contribute to the civil engineering program in the areas of environmental engineering and water resources. As enrollment in the engineering programs grows, additional full-time faculty may be needed in the future.
Civil Engineering

Degree: Bachelor of Science in Civil Engineering (B.S.C.E.)
Major: Civil Engineering
Concentrations: none
College: Business
School: Engineering
Semester Hours Required for Degree: 128

The Bachelor of Science in Civil Engineering (B.S.C.E.) provides integrated coverage of general civil engineering, structural engineering, water resources, environmental engineering, and geotechnical engineering. Students will be prepared to combine social awareness and an interest in humanity with the technical expertise of the engineering profession as they plan, design, and construct a built environment. Although the B.S.C.E. is offered by the College of Business, it is a non-business degree.

B.S.C.E. students complete core courses common to all engineering majors as well as specialized courses in civil engineering. The program prepares students to be successful when taking the Fundamentals of Engineering Exam, the first step towards professional licensure in civil engineering.

Within the context of civil engineering, the undergraduate curriculum, courses, organizations, and activities prepare graduates to:
- Apply knowledge of mathematics, science, and engineering,
- Design and conduct experiments, as well as to analyze and interpret data,
- Design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability,
- Function on multi-disciplinary teams,
- Identify, formulate, and solve engineering problems,
- Understand professional practices and ethical responsibility,
- Communicate effectively,
- Understand the impact of engineering solutions in a global, economic, environmental, and societal context,
- Recognize the need for and have the ability to engage in life-long learning, especially with regard to professional licensure,
- Understand contemporary issues, and
- Use the techniques, skills, and modern engineering tools necessary for engineering practice.

Admission to the B.S.C.E.
Admission to School of Engineering undergraduate programs is open to all students who have been accepted to Florida Gulf Coast University, are in good academic standing, and have completed the communications, mathematics through calculus II, chemistry, and first physics common prerequisite courses with a grade of C or higher. Students must submit an application for admission to the School of Engineering and declare a major.

General education (36 hours):
Students are expected to complete 36 credit hours of approved general education coursework during the first two years of study (refer to General Education Program). Some courses may meet general education requirements as well as fulfill common prerequisite or engineering common core requirements. Students are strongly encouraged to take ECO 2023 Principles of Micro Economics.

Common prerequisites (48 hours):
-- Communications:
  & ENC X101 (3 cr.hr.) English I
  & ENC X102 (3) English II
-- Mathematics:
  & MAC X311* (4) Calculus I w/Analytical Geometry
  & MAC X312* (4) Calculus II w/Analytical Geometry
  & MAC X313* (4) Calculus III w/Analytical Geometry
  & MAP X302 (3) Differential Equations
-- Natural Sciences:
  & CHM X045/ X045L** (4) General Chemistry I
  & PHY X048/ X048L (4) Physics I
  & PHY X049/049L (4) Physics II
-- Humanities & Social Sciences:
  & XXX XXXX (6) Humanities Courses
  & XXX XXXX (6) Social Science Courses
  & XXX XXXX (3) Humanities or Social Sciences

* Or MAC X281, MAC X282, MAC X283
** Or CHSX440 Chemistry for Engineers

Note: Students are encouraged to consult with School of Engineering advisors to identify FGCU courses that satisfy common prerequisite requirements.

Engineering common core (37 hours):
EGN 1006 Introduction to the Engineering Profession (1)
EGN 1930 Concepts and Methods (3)
EGN 2XXX Engineering Economic Analysis (2)
EGN 3310 Engineering Analysis – Statics (3)
EGN 3XXX Engineering Fluid Mechanics (3)
EGN 3XXX Mechanics of Solid Materials (3)
EGN 3XXX Thermodynamics (3)
  or EEL 3003 Electrical Engineering I
EGN 3XXX Service Learning for Engineers (2)
EGN 4XXX Senior Design I (2)
EGN 4XXX  Senior Design II (3)
EGN 4XXX  Engineering Entrepreneurship (3)
ENC 3XXX  Technical Writing (3)
STA 2037  Statistics with Calculus (3)
IDS 3920  University Colloquium (3)

**Civil engineering major (43 hours):**
BSC 1051C  Enviro Bio-SW Flia Environment (3)
EGN 2XXX  Engineering Computer Graphics (2)
EGN 3XXX  Fundamentals of Environmental Engineering (3)
EGN 3XXX  Soil Mechanics (3)
EGN 3XXX  Surveying and Geomatics (4)
EGN 3XXX  Civil Engineering Materials (3)
EGN 4XXX  Hydraulics (3)
EGN 4XXX  Hydrology and Urban Water Systems (3)
EGN 4XXX  Water and Wastewater Treatment (3)
EGN 4XXX  Solid and Hazardous Waste Management (3)
EGN 4XXX  Structural Analysis (4)
EGN 4XXX  Geotechnical Engineering (3)
EGN 4XXX  Design of Concrete Structures (3)
EGN 4XXX  Construction Management (3)

**Additional graduation requirements:**
- Grade of C or higher in the B.S.C.E. common prerequisites, engineering common core, and major coursework.
- Overall grade point average of 2.0 in all coursework attempted at FGCU.
- Within the 128 total credit hours, a minimum of 48 credit hours at the upper division (courses numbered 3000 and higher).
- A minimum of 32 of the last 60 credit hours at FGCU, including 12 credit hours in the major.
- Satisfy the following requirements: CLAST, foreign language, and Gordon Rule writing and computation.
- Satisfy the Service learning requirement. Information is available at www.fgcu.edu/connect/.