AGENDA
Faculty Senate Meeting
September 20, 2018

I. Call to order and Roll Call

II. Approval of Minutes from the April 10, 2018 meeting

III. Report from the Executive Committee

IV. Report from the Academic Affairs Committee ***(See the attachment for complete proposals. See the appendix for supporting materials).***

1. Proposal from the Department of Physics and Engineering
Item A. Modify the heading for Industrial Engineering Courses
Item B. Modify ENGR 310
Item C. Add Mechanical Engineering Program
Item D. Add ENGR 250
Item E. Add ENGR 370
Item F. Add ENGR 400
Item G. Add ENGR 401
Item H. Add ENGR 402
Item I. Add ENGR 411
Item J. Add ENGR 482
Item K. Modify list of degree programs not requiring a minor or collateral
Item L. Modify list of programs in the Department of Physics and Engineering
Item M. Modify ENGR 101
Item N. Modify ENGR 320
Item O. Modify requirements for Industrial Engineering Program
Item P. Modify prerequisites for ENGR 330
Item Q. Modify prerequisites for ENGR 350
Item R. Modify prerequisites for ENGR 468
Item S. Modify course title for ENGR 480
Item T. Modify prerequisites for ENGR 335
Item U. Modify ENGR 397
Item V. Modify Mission Statement for Department of Physics and Engineering.
Item W. Change required courses for a major in Industrial Engineering

V. Report from the Graduate Council (*See the attachment for complete proposals. See the appendix for supporting materials).*

1. Department of Nursing Doctor of Nursing Practice (DNP) Program
Item A. Modify number of hours for APRN program

VI. Old Business
VII. New Business
VIII. Announcements
IX. Adjournment

Attachment to the Faculty Senate Agenda – September 20, 2018

IV. Report from the Academic Affairs Committee

I. Proposal from the Department of Physics and Engineering

A. **MODIFY** on page 120 of the current catalog, the heading **INDUSTRIAL ENGINEERING COURSES (ENGR)**:

FROM:

INDUSTRIAL ENGINEERING COURSES (ENGR)

TO:

ENGINEERING COURSES (ENGR)

Rationale for A: ENGR courses will serve both industrial and the proposed mechanical engineering courses. More generally, some of these courses will be transferable to other universities in a variety of engineering disciplines.

B. **MODIFY** on page 120 of the current catalog, under **ENGINEERING COURSES (ENGR)**:

FROM:

310 Electronics and Instrumentation (4:3-3) (Prerequisites: Physics 202 and Physics 220) F. This class provides an introduction to analog and digital electronics with specific application to instrumentation used in scientific and engineering applications. Topics include analog signal processing, power supplies, sensors (theory and interpretation of sensor data), and microcontrollers with heavy emphasis on design projects to achieve practical results and to give insights on troubleshooting electronic equipment used in the workplace. Credit cannot be received for both Industrial Engineering 310 and Physics 310.

TO:

310 Electronics and Instrumentation (4:3-3) (Prerequisites: Physics 202 and Physics 220) F. This class provides an introduction to analog and digital electronics

with specific application to instrumentation used in scientific and engineering applications. Topics include analog signal processing, power supplies, sensors (theory and interpretation of sensor data), and microcontrollers with heavy emphasis on design projects to achieve practical results and to give insights on troubleshooting electronic equipment used in the workplace. Credit cannot be received for both Engineering 310 and Physics 310.

Rationale for B: Makes the course prefix consistent with the change in Item A.

C. **ADD** on page 121 of the current catalog, before **ENGINEERING COURSES (ENGR)**:

MECHANICAL ENGINEERING
Coordinator: To be determined

MAJOR
Mechanical engineers apply the physics of motion (force, energy, and kinematics) to design equipment, devices, and machines. Mechanical engineers work in a variety of design and manufacturing industries, including aerospace, automotive, construction, energy, and robotics.

A major in mechanical engineering requires completion of the following:

1. Engineering 101, 201, 220, 250, 301, 310, 320, 330, 350, 370, 400, 401, 402, 411, 468, and 482
2. Physics 200, 201, 202, and 220
3. Mathematics 201, 202, 203, 301, and 306
4. Chemistry 101
5. English 318
6. Economics 203 and 204

In addition to the course requirements above, the student is encouraged to pursue a summer of supervised training at a professionally related site off campus. No additional minor or collateral is required.

The minimum number of semester hours required in engineering courses is 52. The minimum number of semester hours in all courses (major and non-major) required for the mechanical engineering degree is 123.

Upon earning credit toward graduation (grade of D or better) in ENGR 250, mechanical engineering majors receive the designation of "Upper-Level Engineering Student". Upper-level engineering students are subject to higher tuition for their remaining semesters of studies (normally their last 4 semesters) as detailed in the University's Tuition & Fees publication.

MINOR
No minor in mechanical engineering is offered.

COLLATERAL
No collateral in mechanical engineering is offered.

Rationale for C: An FMU committee appointed by the Provost performed a feasibility study in late 2017/early 2018. The study reviewed published labor statistics data and a CHE Occupational Outlook report from 2016. In addition, the committee performed two surveys: one of regional engineering employers and another of regional practicing engineers. Nine employers responded to the survey who in total employ over 50 mechanical engineers. Ten practicing engineers responded to the survey. Eight of the nine employers (89%) indicated difficulty in hiring mechanical engineers with 5 (56%) further experiencing issues in retaining mechanical engineers. All employers indicated an interest in hiring mechanical engineering graduates from FMU. Practicing engineers indicated with unanimity that there is a current need for mechanical engineers in and around the Pee Dee and anticipate that need continuing to grow. Finally, both employers and practicing engineers indicated a willingness to support a new mechanical engineering program at FMU (providing coops/internships and serving on an advisory board).

The feasibility committee concluded that "Given the success of FMU's existing industrial engineering program, the University's commitment to a dedicated STEM recruitment strategy, the regional demand for mechanical engineers, and the department's existing resources complimenting a ME curriculum, a new program in mechanical engineering at FMU is feasible."

For more on the "upper-level engineering student" designation please see the rationale for item O below.

D. **ADD** on page 120 of the current catalog, under **ENGINEERING COURSES (ENGR)**:

250 Mechanics of Materials (3) (Prerequisite: 301; Prerequisite/corequisite: Mathematics 301) S. The course covers determination of stresses, deflections, and stability of deformable bodies with an introduction to finite elemental analysis. By successfully completing this course, students will be able to identify, formulate, and solve problems related to the effect of forces on deformable bodies. An emphasis will be placed on the behavior of beams and columns.

E. **ADD** on page 120 of the current catalog, under **ENGINEERING COURSES (ENGR)**:

370 Fluid Mechanics (3) (Prerequisite: 250, Mathematics 301, Mathematics 306, Physics 200) S. The course introduces the concepts and applications of fluid mechanics and dimensional analysis with an emphasis on fluid behavior, internal and external flows, analysis of engineering applications of incompressible pipe systems, and external aerodynamics.

F. **ADD** on page 120 of the current catalog, under **ENGINEERING COURSES (ENGR)**:

400 Thermodynamics and Heat and Mass Transfer (4:3-3) (Prerequisites: 250, 370, Physics 200, Mathematics 301) S. The course covers applications of the laws of thermodynamics to closed and open systems. Topics include steady one-dimensional conduction, lumped parameter analysis, convection, radiation, and diffusion.

G. **ADD** on page 120 of the current catalog, under **ENGINEERING COURSES (ENGR)**:

401 Design of Mechanisms (3) (Prerequisites: 201, 250, Mathematics 301) F. The course focuses on the function, classification, position, velocity, and acceleration of multi-element mechanical linkages. Furthermore, the course discusses design methods and practical information about common mechanisms and mechanism components. By successfully completing this course, students will be able to identify and analyze various mechanical linkage mechanisms, including four-bar mechanisms, gears, gear trains, and cams.

H. **ADD** on page 120 of the current catalog, under **ENGINEERING COURSES (ENGR)**:

402 System Dynamics and Controls (3) (Prerequisites: 250, 310, Mathematics 301) S. The course covers dynamic modeling and simulation of systems with mechanical,

hydraulic, thermal, and/or electrical elements. Topics include frequency response analysis, stability, and feedback control design of dynamic systems.

I. **ADD** on page 120 of the current catalog, under **ENGINEERING COURSES (ENGR)**:

411 Design for Manufacturing and Assembly (3) (Prerequisites: 350 Prerequisite/corequisite: 401) F. The course is based on concurrent engineering techniques to link product design to modern manufacturing and assembly process design. The course will also introduce students to modern manufacturing and assembly process design techniques used to reduce costs. By successfully completing this course, students will be able to: design new products while considering manufacturing and/or assembly processes; redesign existing products to reduce product realization costs; analyze manufacturing and assembly systems to determine inefficiencies; and apply several other Design for X principles.

J. **ADD** on page 121 of the current catalog, under **ENGINEERING COURSES (ENGR)**:

482 Mechanical Engineering Senior Design (4) (Prerequisites: 370, 411) S. This course serves as the capstone design experience for mechanical engineering students. The course involves the design and development of solutions to real-world mechanical engineering problems. Students will demonstrate the ability to work in teams and solve problems, which include multiple realistic constraints and require the application of engineering standards and codes.

Rationale for D-J: These 7 new courses will be required as part of a new B.S. degree in mechanical engineering (item C).

K. **MODIFY** on the bottom of page 64 of the current catalog, the list of degree programs which do not require a minor or collateral:

FROM:

All major programs require students to complete either a minor of 18 semester hours or two collaterals of 12 semester hours each as part of a degree program at Francis Marion University. The only exceptions are programs leading to the Bachelor of Business Administration degree; majors in Art Education, Biology Secondary Education Option (although no minor is required, a collateral in chemistry is required), Early Childhood Education, Elementary Education, English Secondary

Education option, Middle Level Education (no minor or collateral is required for the Middle Level Education major, two specified areas of specialization are required), History Secondary Education Option (no minor or collateral is required), Mathematics Secondary Education option (although no minor is required for the Mathematics Secondary Education option, one collateral is required), and Physics; and double majors (unless a specific minor or collateral is required for one of those majors). Majors in Healthcare Administration (Clinical Track), Bachelor of General Studies and the Bachelor of Science in Nursing programs do not require a minor or collaterals.

TO:

All major programs require students to complete either a minor of 18 semester hours or two collaterals of 12 semester hours each as part of a degree program at Francis Marion University. The only exceptions are programs leading to the Bachelor of Business Administration degree; majors in Art Education, Biology Secondary Education Option (although no minor is required, a collateral in chemistry is required), Early Childhood Education, Elementary Education, English Secondary Education option, Industrial Engineering, Mechanical Engineering, Middle Level Education (no minor or collateral is required for the Middle Level Education major, two specified areas of specialization are required), History Secondary Education Option (no minor or collateral is required), Mathematics Secondary Education option (although no minor is required for the Mathematics Secondary Education option, one collateral is required), and Physics; and double majors (unless a specific minor or collateral is required for one of those majors). Majors in Healthcare Administration (Clinical Track), Bachelor of General Studies and the Bachelor of Science in Nursing programs do not require a minor or collaterals.

L. **MODIFY** on page 66 of the current catalog, under **FRANCIS MARION UNIVERSITY COLLEGE OF LIBERAL ARTS**:

FROM:

Department of Physics and Engineering
- Astronomy (Collateral, no major or minor)
- Industrial Engineering (B.S., no minor or collateral)
- Physics (B.S., minor, collateral)
- Physical Science (Courses only: no major, minor, or collateral)

TO:

Department of Physics and Engineering
- Astronomy (Collateral, no major or minor)
- Industrial Engineering (B.S., no minor or collateral)
- Mechanical Engineering (B.S., no minor or collateral)

Physics (B.S., minor, collateral)
Physical Science (Courses only: no major, minor, or collateral)

M. **MODIFY** on page 120 of the current catalog, under **ENGINEERING COURSES (ENGR)**:

FROM:

101 Introduction to Industrial Engineering (3) (Prerequisite/Corequisite: Mathematics 132 or 137 or permission of department) S. Introduction to the Industrial Engineering (IE) profession, applications of IE principles and approaches, integrated systems approach to problem solving, overall goals and components of the IE degree program, career opportunities, development of engineering work skills, oral and written communication skills, and the importance of professionalism, ethics, contemporary challenges, and lifelong learning.

TO:

101 Introduction to Engineering (3) (Prerequisite/Corequisite: Mathematics 132 or 137 or permission of department) S. Introduction to the engineering profession, applications of engineering principles and approaches, integrated systems approach to problem solving, overall goals and components of the engineering programs, career opportunities, development of engineering work skills, and communication skills. In addition, the course covers the importance of professionalism, ethics, contemporary challenges, and lifelong learning.

Rationale for M: This course is intended to introduce students to the field of industrial and mechanical engineering. The revised course will now serve as an introduction to both industrial and mechanical engineering students.

N. **MODIFY** on page 120 of the current catalog, under **ENGINEERING COURSES (ENGR)**:

FROM:

320 Workplace Data Acquisition and Analysis (3) (Prerequisite: 355; Prerequisite/corequisite: Physics 220) F. This course will introduce students to the theories and applications of data collection, management, analytics, and visualization. A major objective of this course is to develop students' analytical capabilities on customized datasets, including the visualization and communication of observations in addition to the application of statistical, mathematical, and probabilistic analytical methods, to contemporary workplace Industrial Engineering challenges.

TO:

320 Statistics for Engineers (3) (Prerequisite: 250 or 355; Prerequisite/corequisite: Physics 220) F. This course will introduce students to the theories and engineering applications of statistical methods, data analysis, experimental design, and data visualization. A major objective of this course is to develop students' capabilities to analyze datasets, including the visualization and communication of observations in addition to the application of statistical, mathematical, and probabilistic analytical methods, to engineering challenges.

Rationale for N: The emphasis of this course is better reflected in the new title and course description. The course will serve both industrial and mechanical engineering students.

O. **MODIFY** on page 120 of the current catalog, under **INDUSTRIAL ENGINEERING**:

FROM:

Students seeking a B.S. degree in Industrial Engineering must make a formal application for admission to the Industrial Engineering program. Admission to the Industrial Engineering program is a prerequisite for enrollment in Industrial Engineering 220 and Industrial Engineering 355 and those courses that require Industrial Engineering 220 and Industrial Engineering 355 as prerequisites. Application for admission would normally be submitted during the semester in which the following requirements are completed. (Students are encouraged to apply for admission at the end of three semesters of full-time study as a lower division student, provided that all requirements for admission to the program have been met.

REQUIREMENTS FOR ADMISSION INTO THE INDUSTRIAL ENGINEERING PROGRAM

1. Successful completion of the following courses: Physics 200, 201, and 202; Mathematics 201 and 202; and Industrial Engineering 101, 201, and 301. The grades earned in these courses must average at least a 2.0 grade point average.
2. Earned credit in a minimum of 40 undergraduate credit hours with a cumulative grade point average of at least 2.0.

TO:

Upon earning credit toward graduation (grade of D or better) in ENGR 355, industrial engineering majors receive the designation of "Upper-Level Engineering Students." Upper-Level Engineering Students are subject to higher tuition for their remaining

semesters of studies (normally their last 4 semesters) as detailed in the University's Tuition & Fees publication.

Rationale for O: The current 'admission to the program' process was designed to facilitate a designation between lower level and upper level engineering students that would allow for the university to assess a higher tuition rate for the last two years of engineering studies. Unfortunately, administering the current process has been problematic for multiple reasons. This proposal seeks to eliminate the problems while still enabling the assessment of different tuition for the last two years of study.

Unlike other FMU programs with mid-study admissions requirements, industrial engineering does not have an academic need for a gate between years two and three of a typical student's studies. The University policy on "Academic Standing" (p. 59) sufficiently addresses student academic requirements for continuation in the industrial engineering major at all levels of study.

The current admissions requirements were designed in hopes of allowing all students in good academic standing to continue to the upper level engineering courses. Unfortunately, each year the program had one or more students who failed to meet the stated requirements but were in good academic standing. More importantly the department faculty felt that each of these students should be able to proceed. To do otherwise would have cost the student an extra year's studies with no net benefit to the student or program. The first requirement has proven particularly problematic for transfer students who may be missing one introductory course but are otherwise ready to keep moving into their junior year studies.

All of this has led to the department granting waivers or conditional acceptances to such students. But, having a stated policy and then not following it creates issues that must be explained to our accreditation bodies. Finally, the faculty consider our students to be 'engineering majors' from the moment they step foot on campus. We are frequently sending sophomores out on engineering internships as well as the occasional freshman. Having a protocol that suggests such student are not 'admitted to the program' until their junior year is unnecessarily awkward.

We propose a new system that will still accommodate the need for a different tuition tier with a simpler transition between lower level and upper level engineering students. For industrial engineering majors, ENGR 355 is a keystone course taken in the fourth semester of study. We propose that once a student earns credit toward graduation in ENGR 355 (grade of D or better) they are subsequently classified as

upper level engineering students and responsible for the higher engineering tuition rate in future semesters of study.

For mechanical engineering, ENGR 250 is the keystone course taken in the fourth semester. As seen in item C, we propose that once a student earns credit toward graduation in ENGR 250 they are subsequently classified as an upper level engineer.

To ensure that students cannot game the system and avoid upper level tuition by delaying the keystone course, all junior and senior level engineering courses have prerequisites which can be traced back to requiring completion of either ENGR 250 or ENGR 355. In other words, students would not be able to take third year or fourth year ENGR courses without first successfully completing the keystone course. The department is comfortable enforcing these proposed academic prerequisites on a routine basis.

P. **MODIFY** on page 120 of the current catalog, under **ENGINEERING COURSES (ENGR)**:

FROM:

330 Engineering Economy (3) (Prerequisite/corequisite: 355) S. Concepts and techniques of analysis for evaluating the value of products/services, projects, and systems in relation to their cost. A major objective of this course is to develop the students understanding of economic equivalence, the time value of money, financial uncertainty and financial risk, and the way that these concepts can and should be embedded within engineering decision-making.

TO:

330 Engineering Economy (3) (Prerequisite: 250 or 355) S. Concepts and techniques of analysis for evaluating the value of products/services, projects, and systems in relation to their cost. A major objective of this course is to develop the students understanding of economic equivalence, the time value of money, financial uncertainty and financial risk, and the way that these concepts can and should be embedded within engineering decision-making.

Q. **MODIFY** on page 120 of the current catalog, under **ENGINEERING COURSES (ENGR)**:

FROM:

350 Manufacturing Processes (4:3-3) (Prerequisites: 220, 301, and Mathematics 202) F. An overview of manufacturing processes primarily for metals and alloys, focusing on fabrication and joining processes. Emphasis will be placed on process capabilities and limitations, with calculation of process parameters for select processes. Also includes topics in additive manufacturing, heat treatment, product design and process planning, design-for-manufacture/assembly, numerical control, and inspection. The laboratory experience will provide manual and computer-aided process techniques, including assembly, machining, casting, welding, sheet metal forming, powder metallurgy, and inspection.

TO:

350 Manufacturing Processes (4:3-3) (Prerequisites: 250 or 355; 220, 301, and Mathematics 202) F. An overview of manufacturing processes primarily for metals and alloys, focusing on fabrication and joining processes. Emphasis will be placed on process capabilities and limitations, with calculation of process parameters for select processes. Also includes topics in additive manufacturing, heat treatment, product design and process planning, design-for-manufacture/assembly, numerical control, and inspection. The laboratory experience will provide manual and computer-aided process techniques, including assembly, machining, casting, welding, sheet metal forming, powder metallurgy, and inspection.

R. **MODIFY** on page 121 of the current catalog, under **ENGINEERING COURSES (ENGR)**:

FROM:

468 Production Planning (3) (Prerequisite: 355) F. This course provides an in-depth study of the full spectrum of activities of production managers. Topics covered include forecasting, independent demand inventory management, just-in-time inventory management, materials requirement planning, capacity planning, production activity control, and master production scheduling. Emphasis will be given to the use of personal computers to support decision making. Credit cannot be received for both Industrial Engineering 468 and Management 468.

TO:

468 Production Planning (3) (Prerequisite: 250 or 355) F. This course provides an in-depth study of the full spectrum of activities of production managers. Topics covered include forecasting, independent demand inventory management, just-in-time inventory management, materials requirement planning, capacity planning, production activity control, and master production scheduling. Emphasis will be

given to the use of personal computers to support decision making. Credit cannot be received for both Engineering 468 and Management 468.

Rationale for P-R: We propose to replace the "Admission to the Program" requirements (see item O). Since engineering students pay higher tuition in their last two years, we propose a prerequisite system that can be used to designate "Upper-Level Engineering Students". In the industrial engineering program successful completion of ENGR 355 will serve as a keystone course and the trigger for the "Upper-Level" designation. In the mechanical engineering program, successful completion of ENGR 250 will serve as this trigger. All ENGR courses in the last two years of study will have prerequisites which require successful completion of one of these keystone courses.

S. **MODIFY** on page 121 of the current catalog, under **ENGINEERING COURSES (ENGR)**:

FROM:

480 Senior Design (4) (Prerequisite: 420 and 467; Prerequisites/corequisites: 330, 356 and 470) S. The capstone design course for industrial engineering majors. Survey of methods, tools, and techniques used to plan, communicate, manage and control projects, and work on teams. Students work in teams to develop a proposal for, and implement, an industrial engineering design project for an actual manufacturing or service industry client.

TO:

480 Industrial Engineering Senior Design (4) (Prerequisite: 420 and 467; Prerequisites/corequisites: 330, 356 and 470) S. The capstone design course for industrial engineering majors. Survey of methods, tools, and techniques used to plan, communicate, manage and control projects, and work on teams. Students work in teams to develop a proposal for, and implement, an industrial engineering design project for an actual manufacturing or service industry client.

Rationale for S: With the addition of a senior design course in mechanical engineering (item J), the new title for this course specifies the industrial engineering program.

T. **MODIFY** on page 120 of the current catalog, under **ENGINEERING COURSES (ENGR)**:

FROM:

355 Production and Operations Management (3) (Prerequisite: Admission to the Industrial Engineering program or permission of the department) S. Introduction to production and operations component of manufacturing and service organizations, based on the traditional and the contemporary IE standpoint. Topics include: Types of manufacturing systems, Lean Manufacturing, DMAIC, Kanban, queueing theory, and discrete event simulation.

TO:

355 Production and Operations Management (3) (Prerequisite: 301 and Mathematics 202) S. Introduction to production and operations component of manufacturing and service organizations, based on the traditional and the contemporary IE standpoint. Topics include: Types of manufacturing systems, Lean Manufacturing, DMAIC, Kanban, queueing theory, and discrete event simulation.

U. **MODIFY** on page 121 of the current catalog, under **ENGINEERING COURSES (ENGR)**:

FROM:

397 Undergraduate Research in Industrial Engineering (3), (2), or (1) (Prerequisites: 320 and admission to the program) F, S. This course will be open to students in their junior or senior year. Working with a faculty member of the Industrial Engineering program, each student enrolled will be assigned to one or more research projects related to Industrial Engineering. The project(s) assigned will be determined based on the interest of the student. The number of hours will be based on the complexity of the project and the time required to complete the project(s). The culmination of this course will require a written report and a formal oral presentation.

TO:

397 Undergraduate Research in Engineering (3), (2), or (1) (Prerequisite: 320) F, S. This course will be open to students in their junior or senior year. Working with an engineering faculty member, each student enrolled will be assigned to one or more engineering research project(s). The project(s) assigned will be determined based on the interest of the student. The number of hours will be based on the complexity of the project and the time required to complete the project(s). The culmination of this course will require a written report and a formal oral presentation.

V. **MODIFY** on page 116 of the current catalog, under **DEPARTMENT OF PHYSICS & ENGINEERING**:

FROM:

MISSION STATEMENT

The Department of Physics and Engineering offers a baccalaureate degree in Physics with a concentration in Computational Physics or Health Physics. Courses are offered in Physics, Physical Science, and Astronomy that fulfill the University's General Education requirement. These courses also serve as foundation courses for majors in biology, chemistry, mathematics, and engineering. The fundamental natural laws of the physical universe and the methods of scientific inquiry are essential parts of a liberal arts education. B.S. degrees in Engineering Technology with concentrations in Civil or Electronic are offered in conjunction with South Carolina's technical colleges. The Environmental Science option in Physics offers students a B.S. degree in Physics with a concentration in Environmental Science.

The Physics programs seek to offer courses in astronomy, physical science, and physics that are taught by full-time faculty members with appropriate advanced degrees dedication to science education at the University level. The courses offered in the department range in level from introductory courses that expose non-science majors to scientific thought to advanced courses that cover current and complex topics in modern physics. The laboratory experience is required in appropriate courses to illustrate the importance of experimentation to the scientific endeavor. For the majors in physics, the opportunity to undertake undergraduate research is offered. Since part of research is the interpretation and communication of results, majors graduating from these programs in the department are expected to be proficient in oral and written communication, familiar with the scientific literature, and aware of the importance and usage of computers in science.

Students completing the majors offered by the department will be prepared for careers in industry and scientific research or for graduate school.

TO:

MISSION STATEMENT

The Department of Physics and Engineering offers baccalaureate degrees in Physics, Industrial Engineering, Mechanical Engineering, and Engineering Technology. The department also offers a collateral in Astronomy. Students majoring in Physics choose a concentration in either Computational Physics or Health Physics. Students majoring in Engineering Technology choose a concentration in either Civil Engineering Technology or Electronics Engineering Technology. The engineering technology degrees are offered in conjunction with South Carolina's technical colleges. Additional engineering options for students include a Dual-Degree Program in Engineering with Clemson University and a non-degree Pre-Engineering

curriculum. The Environmental Science option in Physics offers students a B.S. degree in Physics with a concentration in Environmental Science.

Courses are offered in physics, physical science, and astronomy that fulfill the University's General Education requirement. These courses also serve as foundation courses for majors in biology, chemistry, mathematics, and engineering. The fundamental natural laws of the physical universe and the methods of scientific inquiry are essential parts of a liberal arts education.

The Department of Physics and Engineering seeks to offer courses in astronomy, engineering, physical science, and physics that are taught by full-time faculty members with appropriate advanced degrees dedicated to science education at the University level. The faculty strive for excellence in instruction, research, and discipline-related service to the community. The courses offered in the department range in level from introductory courses that expose non-science majors to scientific thought to advanced courses that cover contemporary topics in physics and engineering.

The laboratory experience is required in appropriate courses to illustrate the importance of experimentation to the scientific endeavor and engineering profession. For the majors in the department, the opportunity to undertake undergraduate research is offered and professional internships are encouraged. Majors graduating from programs in the department are expected to be proficient in oral and written communication, familiar with the scientific and engineering literature, and aware of the importance and usage of technology in science and engineering.

Students completing the majors offered by the department will be prepared for careers in industry and scientific research or for graduate school.

Rationale for V: The mission has been improved and updated to reflect the addition of engineering programs.

W. **CHANGE** on page 119 of the current catalog, under **INDUSTRIAL ENGINEERING**:

FROM:

A major in industrial engineering requires the completion of the following:

1. Engineering 101, 201, 220, 301, 310, 320, 330, 350, 355, 356, 373, 420, 467, 468, 470, and 480

2. Physics 200, 201, 202, and 220
3. Mathematics 201, 202, 203, 304, and 306
4. Chemistry 101
5. English 305
6. Economics 203 and 204

TO:

A major in industrial engineering requires completion of the following:

1. Engineering 101, 201, 220, 301, 310, 320, 330, 350, 355, 356, 373, 420, 467, 468, 470, and 480
2. Physics 200, 201, 202, and 220
3. Mathematics 201, 202, 203, 304, and 306
4. Chemistry 101
5. English 318
6. Economics 203 and 204

Rationale for W: In preparing the curriculum for mechanical engineering, faculty met with colleagues from the writing program and agreed that English 318 (Technical Communication) would be a preferred requirement for all engineering majors over the current requirement of English 305 (Business Writing).

V. Report from the Graduate Council *(See the attachment for complete proposals. See the appendix for supporting materials).*

I. Department of Nursing Doctor of Nursing Practice (DNP) Program

Item A. Modify number of hours in the APRN Program

FROM:

DNP 805 Project Development
(3:0-9) [135 hours (95 clinical hours & 40 project hours)] This course assists the graduate student to focus attention on a specific quality improvement project that can be fully investigated and developed into a capstone project. This course includes clinical and project hours to prepare the graduate student to fully understand the delivery of quality patient care in the advanced practice role.

DNP 807 Capstone 1
(3:0-9) (135 clinical hours) This course focuses of the planning of an evidence-based practice, quality improvement project. This course assists the graduate student to develop a project that will make a significant improvement in patient care. In addition, the graduate students will begin to formalize a professional portfolio.

DNP 808 Capstone 2

(3:0-9) (135 clinical hours) (Prerequisite DNP 807) This course focuses on the implementation and the evaluation of an evidence-based practice, quality improvement project. The culmination of this course will contain disseminated project results. In addition, the graduate student will complete a professional portfolio.

TO:

DNP 805 Project Development
(4:1-9) (135 clinical/project hours) This course assists the graduate student to focus attention on a specific quality improvement project that can be fully investigated and developed into a capstone project. This course includes clinical/project hours to prepare the graduate student to fully understand the delivery of quality patient care in the advanced practice role.

DNP 807 Capstone 1
(4:1-9) (135 clinical/project hours) This course focuses of the planning of an evidence-based practice, quality improvement project. This course assists the graduate student to develop a project that will make a significant improvement in patient care. In addition, the graduate students will begin to formalize a professional portfolio.

DNP 808 Capstone 2
(4:1-9) (135 clinical/project hours) (Prerequisite DNP 807) This course focuses on the implementation and the evaluation of an evidence-based practice, quality improvement project. The culmination of this course will contain disseminated project results. In addition, the graduate student will complete a professional portfolio.

FROM: (Page 203)

FULL-TIME OPTION FOR APRNS
Term One

Course	Semester Hours	Total Semester Hours
DNP 800 Doctoral Knowledge Development	3	
DNP 801 Doctoral Research and Epidemiological Evidence-based Practice	3	
DNP 802 Doctoral Health Policy and Leadership (45 clinical/project hours)	3	
TOTAL SEMESTER HOURS		9

Term Two

DNP 803 The Role of Technology and Interprofessional Collaboration	3	
DNP 804 Ethics and Quality Improvement (90 clinical/project hours)	3	
DNP 805 Project Development (135 clinical/project hours)	3	
TOTAL SEMESTER HOURS		9

Term Three

DNP 806 Scholarly Writing and Grant Development	3	
DNP 807 Capstone 1 (135 clinical/project hours)	3	
DNP 808 Capstone 2 (135 clinical/project hours)	3	
TOTAL SEMESTER HOURS		9
TOTAL PROGRAM SEMESTER HOURS		27

• The curriculum includes 540 clinical/project hours.

TO:

FULL-TIME OPTION FOR APRNs

Term One

Course	Semester Hours	Total Semester Hours
DNP 800 Doctoral Knowledge Development	3	
DNP 801 Doctoral Research and Epidemiological		
Evidence-based Practice	3	
DNP 802 Doctoral Health Policy and		
Leadership (45 clinical/project hours)	3	
TOTAL SEMESTER HOURS		9

Term Two

DNP 803 The Role of Technology and		
Interprofessional Collaboration	3	
DNP 804 Ethics and Quality Improvement		
(90 clinical/project hours)	3	
DNP 805 Project Development		
(135 clinical/project hours)	4	
TOTAL SEMESTER HOURS		10

Term Three

DNP 806 Scholarly Writing and Grant Development	3	
DNP 807 Capstone 1 (135 clinical/project hours)	4	
DNP 808 Capstone 2 (135 clinical/project hours)	4	
TOTAL SEMESTER HOURS		11
TOTAL PROGRAM SEMESTER HOURS		30

• The curriculum includes 540 clinical/project hours.

FROM: (Page 204)

FULL-TIME OPTION FOR BSN TO DNP/APRN PROGRAM

Course	Semester Hours	Total Semester Hours
Term 1 Year 1		
DNP 800 Doctoral Knowledge Development	3	
DNP 802 Doctoral Health Policy and Leadership (45 clinical hours)	3	
APRN 602 Advanced Pharmacology	3	
TOTAL SEMESTER HOURS		9
Term 2 Year 1		
APRN 502 Biostatistics	3	
APRN 601 Advanced Pathophysiology	3	
DNP 803 The Role of Technology and Interprofessional Collaboration	3	
TOTAL SEMESTER HOURS		9
Term 3 Year 1		
APRN 603 Advanced Physical Assessment and Health Promotion (45 laboratory hours)	4	
DNP 801 Doctoral Research and Epidemiological Evidence-based Practice	3	
TOTAL SEMESTER HOURS		7
Term 1 Year 2		
APRN 507 Patient Education and Advocacy	3	
APRN 701 Primary Care of Adults (135 clinical hours)	5	
TOTAL SEMESTER HOURS		8
Term 2 Year 2		
APRN 702 Primary Care of Infants, Children and Adolescents (90 clinical hours)	4	
APRN 703 Primary Care of Women (45 clinical hours)	2	
DNP 804 Ethics and Quality Improvement (90 clinical hours)	3	
TOTAL SEMESTER HOURS		9
Term 3 Year 2		
DNP 806 Scholarly Writing and Grant Development	3	
APRN 704 Primary Care of Geriatric Patients (45 clinical hours)	2	
APRN 707 Clinical Decision-making and Ethics	3	
TOTAL SEMESTER HOURS		8
Term 1 Year 3		

APRN 705 Internship I (135 clinical hours)	4		
APRN 706 Internship II (135 clinical hours)	4		
TOTAL SEMESTER HOURS		8	
Term 2 Year 3			
DNP 805 Project Development (135 clinical/project hours)	3		
DNP 807 Capstone 1 (135 clinical/project hours)	3		
TOTAL SEMESTER HOURS		6	
Term 3 Year 3			
DNP 808 Capstone 2 (135 clinical/project hours)	3		
TOTAL SEMESTER HOURS		3	
TOTAL PROGRAM SEMESTER HOURS			**67**

TO:

FULL-TIME OPTION FOR BSN TO DNP/APRN PROGRAM

Course	Semester Hours	Total Semester Hours
Term 1 Year 1		
DNP 800 Doctoral Knowledge Development	3	
DNP 802 Doctoral Health Policy and Leadership (45 clinical hours)	3	
APRN 602 Advanced Pharmacology	3	
TOTAL SEMESTER HOURS		9
Term 2 Year 1		
APRN 502 Biostatistics	3	
APRN 601 Advanced Pathophysiology	3	
DNP 803 The Role of Technology and Interprofessional Collaboration	3	
TOTAL SEMESTER HOURS		9
Term 3 Year 1		
APRN 603 Advanced Physical Assessment and Health Promotion (45 laboratory hours)	4	
DNP 801 Doctoral Research and Epidemiological Evidence-based Practice	3	
TOTAL SEMESTER HOURS		7
Term 1 Year 2		
APRN 507 Patient Education and Advocacy	3	

APRN 701 Primary Care of Adults (135 clinical hours)	5	
TOTAL SEMESTER HOURS		8
Term 2 Year 2		
APRN 702 Primary Care of Infants, Children and Adolescents (90 clinical hours)	4	
APRN 703 Primary Care of Women (45 clinical hours)	2	
DNP 804 Ethics and Quality Improvement (90 clinical hours)	3	
TOTAL SEMESTER HOURS		9
Term 3 Year 2		
DNP 806 Scholarly Writing and Grant Development	3	
APRN 704 Primary Care of Geriatric Patients (45 clinical hours)	2	
APRN 707 Clinical Decision-making and Ethics	3	
TOTAL SEMESTER HOURS		8
Term 1 Year 3		
APRN 705 Internship I (135 clinical hours)	4	
APRN 706 Internship II (135 clinical hours)	4	
TOTAL SEMESTER HOURS		8
Term 2 Year 3		
DNP 805 Project Development (135 clinical/project hours)	4	
DNP 807 Capstone 1 (135 clinical/project hours)	4	
TOTAL SEMESTER HOURS		8
Term 3 Year 3		
DNP 808 Capstone 2 (135 clinical/project hours)	4	
TOTAL SEMESTER HOURS		4
TOTAL PROGRAM SEMESTER HOURS		70

RATIONALE:

The Doctor of Nursing Practice (DNP) program was developed and approved internally and at the state level as a twenty-seven (27) semester hour program with an optional three (3) to six (6) credit course if needed for students to complete their scholarly projects. Under the 2012, Southern Association of Colleges and Schools Commission on Colleges (SACS-COC) regulation

2.71 in *The Principles of Accreditation: Foundations for Quality Enhancement* (http://www.sacscoc.org/pdf/2012PrinciplesOfAcreditation.pdf) states:

> The institution offers one or more degree programs based on at least 60 semester credit hours or the equivalent at the associate level; at least 120 semester credit hours or the equivalent at the baccalaureate level; or at least 30 semester credit hours or the equivalent at the post-baccalaureate, graduate, or professional level. If an institution uses a unit other than semester credit hours, it provides an explanation for the equivalency. The institution also provides a justification for all degrees that include fewer than the required number of semester credit hours or its equivalent unit (p. 19).

Additionally, Standard 4.4 Program Length states:
"Program length is appropriate for each of the institution's educational programs (p. 39).

The Principles of Accreditation: Foundations for Quality Enhancement was updated in December of 2017 and the wording is similar.
http://www.sacscoc.org/pdf/2018PrinciplesOfAcreditation.pdf

> The institution offers one or more degree programs based on at least 60 semester credit hours or the equivalent at the associate level; at least 120 semester credit hours or the equivalent at the baccalaureate level; or at least 30 semester credit hours or the equivalent at the post-baccalaureate, graduate, or professional level. The institution provides an explanation of equivalencies when using units other than semester credit hours. The institution provides an appropriate justification for all degree programs and combined degree programs that include fewer than the required number of semester credit hours or its equivalent unit (p. 21).

The December 2017 edition of *The Principles of Accreditation: Foundations for Quality Enhancement* (effective January of 2018) only appears once as stated above. This removes the clause that provides educational institutions additional rational for flexibility in program length.

Additionally, although twenty-seven (27) credit DNP programs are common, we would like to change credits for three (3) of the project intensive courses because after the first cohort has experienced the majority of the courses the faculty has realized the project courses are labor intensive and should carry an additional credit. The rigor to guide the students to produce a doctoral-level project will not be jeopardized.