

**INSTRUCTION, RESEARCH, AND STUDENT AFFAIRS**  
**APRIL 20, 2017**

---

<b>TAB</b>	<b>DESCRIPTION</b>	<b>ACTION</b>
<b>1</b>	<b>BOARD POLICY III.Q. ADMISSIONS STANDARDS – FIRST READING</b>	Motion to Approve
<b>2</b>	<b>BOISE STATE UNIVERSITY – BACHELOR OF SCIENCE IN ENGINEERING</b>	Motion to Approve

THIS PAGE INTENTIONALLY LEFT BLANK

**INSTRUCTION, RESEARCH, AND STUDENT AFFAIRS**  
**APRIL 20, 2017**

---

**SUBJECT**

Board Policy III.Q, Admissions Standards – First Reading

**REFERENCE**

June 2007	Board approved the first reading of amendments to Board Policy III.Q.
August 2007	Board approved the second reading of amendments to Board Policy III.Q.
December 2013	Board approved the first reading of amendments to Board Policy III.Q.
February 2014	Board approved the second reading of amendments to Board Policy III.Q.

**APPLICABLE STATUTES, RULE OR POLICY**

Idaho State Board of Education Governing Policies & Procedures, Section III.Q, Admissions Standards

**BACKGROUND / DISCUSSION**

At its October 2016 meeting, the State Board of Education (Board) approved a new section of Board Policy III.O regarding placement for entry-level college courses. This section of policy was originally addressed in Board Policy III.Q Admission Standards. Proposed amendments include removing the course placement section, which is now its own policy. Other proposed amendments include:

- Adding Direct Admissions program under sub section 4.
- Updating subject area titles within the Idaho college admission requirements chart.
- Removal of the course placement section, including tests no longer available.
- Changing the term “conditional” to “provisional” admission as it is the most commonly used term on campuses.
- Clarifying language providing institutional discretion regarding students admitted on provisional status.
- General language updates to remove dated references.

**IMPACT**

Proposed amendments include cleaning up dated language throughout policy, ensuring consistency with the placement policy approved at the December 2016 Board meeting, and adding the Direct Admissions program as another method for admitting students into Idaho’s public colleges and universities.

**ATTACHMENTS**

Attachment 1 – Board Policy III.Q, Admissions Standards – First Reading Page 3

**INSTRUCTION, RESEARCH, AND STUDENT AFFAIRS**  
**APRIL 20, 2017**

---

**STAFF COMMENTS AND RECOMMENDATIONS**

Board staff reviewed Board Policy III.Q in its entirety with the Admission Directors from Idaho's public postsecondary institutions and identified areas that needed to be updated or clarified.

The Council on Academic Affairs and Programs supported the proposed amendments at their March 23, 2017 meeting with the understanding that the policy would clarify the requirements for a student accepted under the Direct Admissions program. Proposed amendments were recommended for approval by the Instruction, Research and Student Affairs (IRSA) at its March 30, 2017 meeting.

Staff recommends approval.

**BOARD ACTION**

I move to approve the first reading of the proposed amendments to Board Policy III.Q, Admission Standards as presented in Attachment 1.

Moved by \_\_\_\_\_ Seconded by \_\_\_\_\_ Carried Yes \_\_\_\_\_ No \_\_\_\_\_

**Idaho State Board of Education**  
**GOVERNING POLICIES AND PROCEDURES**

**SECTION: III. POSTSECONDARY AFFAIRS**

**SUBSECTION: Q. Admission Standards**

June 2017~~December 2016~~

1. Coverage

Boise State University, College of Western Idaho, College of Southern Idaho, Eastern Idaho Technical College, Idaho State University, Lewis-Clark State College, North Idaho College and The University of Idaho are included in this subsection. The College of Southern Idaho, College of Western Idaho and North Idaho College are exempted from certain provisions of this admission policy ~~as determined~~when established in policy by their local boards of trustees.

2. Purposes

The purposes of the admission policies are to:

- a. Promote institutional policies which meet or exceed minimum statewide standards for admission to higher education institutions;
- b. Inform students of the academic and ~~applied—technology~~technical degree expectations of postsecondary-level work;
- c. Improve the quality of academic and ~~applied—technology~~technical degree preparation for postsecondary programs;
- d. Enhance student access to academic and ~~applied—technology~~technical degree programs; and
- e. Admit to postsecondary education institutions those students for whom there is a reasonable likelihood of success.

3. Policies

The college and universities must, ~~with prior Board approval,~~ establish institutional policies which meet or exceed the following minimum admission standards. Additional and more rigorous requirements also may be established by the college and universities for admission to specific programs, departments, schools, or colleges within the institutions. Consistent with institutional policies, admission decisions may be appealed by applicants to the institutional admissions committee.

4. Academic College and University Regular Admission

Students attending an Idaho public school may be notified of their admission to an Idaho public college or university through the State Board's Direct Admission Program. Admission awarded through the program is contingent upon verified level

**INSTRUCTION, RESEARCH, AND STUDENT AFFAIRS**  
**APRIL 20, 2017**

of achievement in high school curriculum and performance on a college entrance exam, and, successful completion of state high school graduation requirements.

A degree-seeking student with fewer than fourteen (14) credits of postsecondary work  
An applicant who is not admitted under the State Board's Direct Admission Program  
must complete each of the minimum requirements listed below. (International students and those seeking postsecondary career technical studies are exempt.)

- a. Submit scores received on the ACT (American College Test) (ACT) or SAT (Scholastic Aptitude Test) (SAT) and/or other standardized diagnostic tests as determined by the institution. These scores will be required of applicants graduating from high school in 1989 or later. Exceptions include applicants who have reached the age of 21. These applicants are subject to each institution's testing requirements: and
- b. Graduate from an accredited high school and complete the courses below with a minimum 2.00 cumulative grade point average. Applicants who graduate from high school in prior to 1989 or later will be subject to the admission standards at the time of their graduation.

Admissions Standards Core

Subject Area	Minimum Requirement	Select from These Subject Areas
<u>English</u> <u>Secondary</u> <u>Language Arts</u> <u>and</u> <u>Communication</u>	8 credits	Composition, Literature, <u>Oral Communication</u>
<u>Mathematics</u>	6 credits	A minimum of six (6) credits, including Applied Math I or Algebra I; Geometry or Applied Math II or III; and Algebra II. A total of 8 credits are strongly recommended.  Courses not identified by traditional titles, i.e., Algebra I or Geometry, may be used as long as they contain all of the critical components (higher math functions) prescribed by the State Mathematics Achievement Standards.  Other courses may include Probability, Discrete Math, Analytic Geometry, Calculus, Statistics, and Trigonometry. Four (4) of the required mathematics credits must be taken in the 10 <sup>th</sup> , 11 <sup>th</sup> , and 12 <sup>th</sup> grade.
<u>Social</u> <u>Science</u> <u>Studies</u>	5 credits	American Government (state and local), Geography, U.S. History, and World History. Other courses may be selected from Economics (Consumer Economics if <u>it includes components as recommended by the State Department of Education aligns to the state content standards</u> ), Psychology, and Sociology.
<u>Natural</u> <u>Science</u>	6 credits	Anatomy, Biology, Chemistry, Earth Science, and Geology. Physiology, Physics, Physical Science, Zoology. A maximum of

**INSTRUCTION, RESEARCH, AND STUDENT AFFAIRS**  
**APRIL 20, 2017**

		<p>two (2) credits may be derived from <del>vocational-career technical science courses jointly approved by the State Department of Education and the State Division of Career Technical Education</del>when courses are aligned to <u>state career technical content standards</u>, and/or Applied Biology, and/or Applied Chemistry. (Maximum of two (2) credits).</p> <p>Must have laboratory science experience in at least two (2) credits.</p> <p>A laboratory science course is defined as one in which at least one (1) class period per week is devoted to providing students with the opportunity to manipulate equipment, materials, or specimens; to develop skills in observation and analysis; and to discover, demonstrate, illustrate, or test scientific principles or concepts.</p>
<u>Arts and Humanities (including world languages)</u> <del>Foreign Language</del>	2 credits	<p>Literature, History, Philosophy, Fine Arts (if the course <del>includes components recommended by the State Department of Education, i.e., theory, history appreciation and evaluation</del>is aligned to the <u>state arts and humanities content standards</u>), and inter-disciplinary humanities (related study of two or more of the traditional humanities disciplines). History courses beyond those required for state high school graduation may be counted toward this category.</p> <p><u>Foreign-World Language</u> is strongly recommended. The Native American Languages may meet the foreign language credit requirement</p>
Other College Preparation	3 credits	<p>Speech or Debate (no more than one (1) credit). Debate must be taught by a certified teacher.</p> <p>Studio/Performing Arts (art, dance, drama, and music).</p> <p>Foreign Language (beyond any foreign language credit applied in the Humanities/Foreign Language category).</p> <p><del>State Division of Career technical education-approved</del> classes (no more than two (2) credits) in Agricultural science and technology, business and office education, health occupations education, family and consumer sciences education, occupational family and consumer sciences education, technology education, marketing education, trade, industrial, and technical education, and individualized occupational training.</p>

~~c. Placement in entry-level college courses will be determined according to the following criteria.~~

**Placement Scores for English**

Class	ACT-English Score	SAT-English Score	AP-Exam	COMPASS Score
English 90	<17	>200	NA	0-67
English 101	18-24	>450	NA	68-94
English 101 Credit English 102 Placement	25-30	>570	3 or 4	95-99
Credit English 101 and English 102	>31	>700	5	

**INSTRUCTION, RESEARCH, AND STUDENT AFFAIRS**  
**APRIL 20, 2017**

---

**Placement Scores for Math**

Class	ACT Math Score	SAT Math Score	COMPASS Score
Math 123 Math 127 Math 130	≥19	≥460	Algebra ≥ 45
Math 143 Math 147 Math 253-254	≥23	≥540	Algebra ≥61
Math 144 Math 160	≥27	≥620	College Algebra ≥51
Math 170	≥29	≥650	College Algebra ≥51 Trigonometry ≥51

**NOTES:**

If athe high school the student graduated from does not offer a required course, applicants may contact the institutional admission officer for clarification of provisional admission procedures.

High school credit counted in one (1) category (e.g., Humanities/Foreign World Languages) may not count in another category.

5. Academic College and University Conditional Provisional Admission

- a. ~~It is the Board's intent that a~~ A ~~student seeking conditional provisional admission to any public postsecondary institution must take at least two (2) testing indicators that will allow the institution to assess competency and placement.~~

~~i. Submit scores received on ACT (American College Test) or SAT (Scholastic Aptitude Test) scores must be submitted prior to enrollment. Effective fall semester 1989.~~

~~b.ii. Effective fall semester 1989, a~~ A ~~degree-seeking applicant who does not qualify for admission based on 4.b above but who satisfies one (1) of the criteria below, may be asked to petition seek provisional admission by petitioning the institutional admission director for admissions.;~~

- i. ~~A high school g~~ G ~~raduated~~ d ~~from an accredited secondary school who but has not completed the Board's Admission Standards Ceore set forth above and has a predicted college GPA of 2.00 based on ACT, SAT and/or ACT COMPASS at the institution to which the student is seeking admission.;~~

- ii. ~~Students who Did not graduate from an non-accredited secondary schools, including or was home schooled studentss must have a predicted college GPA of 2.00 based on the ACT or SAT at the institution to which the student is~~



**INSTRUCTION, RESEARCH, AND STUDENT AFFAIRS**  
**APRIL 20, 2017**

---

~~seeking admission. In addition, the student must have and has an acceptable performance on one (1) of the following two (2) testing indicators: (a) either the GED (General Educational Development) Test; or (b) another standardized diagnostic test accepted by the institutions such as the ACT COMPASS, ASSET, or CPT.~~

- iii. Deserves special consideration by the institution, e.g., disadvantaged or minority students, delayed entry students, returning veterans, or talented students wishing to enter college early.

~~NOTE: Regarding the ACT/SAT, this requirement is for students who graduated from high school in 1989 or later. Students who have graduated prior to 1989 or who have reached the age of 21 at the time of application are subject to each institution's testing requirements for admission.~~

~~—A student seeking provisional admission to any public postsecondary institution must take at least two (2) testing indicators that will allow the institution to assess competency and placement, one (1) of which must be the ACT or SAT. ACT or SAT scores must be submitted prior to enrollment.~~

- c. If provisionally admitted, ~~the a~~ student ~~must will~~ enroll with conditional provisional standing and is subject to the institutional grade retention/probation/dismissal policies; ~~—, excepting that a~~ provisionally admitted student ~~with conditional provisional standing~~ may change to regular admission status upon satisfactory completion of fourteen (14) baccalaureate-level credits, twelve (12) of which must be ~~in four (4) different subject areas of the general education requirements of courses the institution the student is attending.~~ Regular admission status must be attained within three (3) registration periods or the student will be dismissed, subject to institutional committee appeal procedures.

## 6. Advanced Opportunities Students

~~These s~~Secondary students who wish to participate in the Advanced Opportunities outlined in Board Policy Section III.Y. Advanced Opportunities, must follow the procedures outlined in Board Policy III.Y.

## 7. Transfer Admission

- a. ~~Effective fall semester 1989, a~~ degree-seeking student ~~with who, since after graduating from high school or earning a GED, has earned at least~~ fourteen (14) or more semester hours of transferable baccalaureate academic college-level credit from ~~another a regionally accredited college or university and with a minimum~~ cumulative GPA of 2.00 ~~or higher~~ may be admitted.
- b. A student not meeting ~~this the~~ requirement in section 7.a, above, may petition the institutional admissions director ~~of admissions to be admitted~~. If admitted, the student must enroll on probation status, meet all conditions imposed by the

**INSTRUCTION, RESEARCH, AND STUDENT AFFAIRS**  
**APRIL 20, 2017**

---

institutional admissions committee, and complete the first semester with a minimum 2.00 GPA ~~or higher~~, or may be dismissed.

~~The community colleges work cooperatively with the college and universities to ensure that transfer students have remedied any high school deficiencies, which may have prevented them from entering four-year institutions directly from high school.~~

~~8. Compliance and Periodic Evaluation~~

~~The Board will establish a mechanism for:~~

~~a. monitoring institutional compliance with the admission standards;~~

~~conducting and reporting periodic analyses of the impact, problems, and benefits of the admission standards; and~~

~~providing information as necessary and appropriate from the college and universities to the secondary schools and community colleges on the academic performance of former students.~~

**98. Career Technical Education Admissions**

**a. Admission Standards**

*Regular* or Conditional-Provisional admission standards apply to individuals who seek a technical certificate or Associate of Applied Science (A.A.S.) degree through a career technical program. The admission standards and placement criteria do not apply to Workforce Development or, Short-term Training programs, Farm Management, Truck Driving, Apprenticeship, and Fire and Emergency Service courses/programs. Career technical programs employ program admission processes in addition to institutional program admission.

**b. Placement Tests**

Placement test scores indicating potential for success are generally required for enrollment in a career technical program of choice. Placement score requirements vary according to the program.

**c. Idaho Technical College System**

The career technical programs are offered at the following locations:

Region I	Coeur d'Alene, North Idaho College
Region II	Lewiston, Lewis-Clark State College
Region III	Nampa, College of Western Idaho
Region IV	Twin Falls, College of Southern Idaho
Region V	Pocatello, Idaho State University

**INSTRUCTION, RESEARCH, AND STUDENT AFFAIRS**  
**APRIL 20, 2017**

---

Region VI     Idaho Falls, Eastern Idaho Technical College

d. ~~Purposes~~Student Advising

- i. Clarify the importance of career planning and preparation: high school students should be actively engaged in career planning prior to entering the 9th grade. Career planning assures that students have sufficient information about self and work requirements to adequately design an education program to reach their career goals.
- ii. Emphasize that career technical courses in high school, including career technical advanced opportunities and work-based learning connected to school-based learning, are beneficial to students seeking continued education in career technical programs at the postsecondary level.
- iii. Clarify the kind of educational preparation necessary to successfully enter and complete postsecondary studies. Mathematics and science are essential for successful performance in many career technical programs. Programs of a technical nature generally require greater preparation in applied mathematics and laboratory sciences.
- iv. Clarify that career technical programs of one or two years in length may require additional time if applicants lack sufficient educational preparation.

e. Career ~~technical~~Technical Regular Admission

Students desiring *Regular Admission* to any of Idaho's technical colleges must meet the following standards. Students planning to enroll in programs of a technical nature are also strongly encouraged to complete the recommended courses. Admission to a specific career technical program is based on the capacity of the program and specific academic and/or physical requirements established by the technical college/program.

- i. Standards for students who graduate from high school ~~graduates of in~~ 1997 ~~and thereafter or earlier~~
  - 1) High School diploma with a minimum 2.0 GPA<sup>1</sup>; and,
  - 2) Placement examination<sup>2</sup> (~~CPT, ACT COMPASS, ACT, SAT~~ or other diagnostic/placement tests as determined by the institution. ~~CPT or ACT~~

---

<sup>1</sup>An institution may ~~choose to~~ substitute a composite index placement exam score and high school GPA for the GPA admission requirement.

<sup>2</sup>If accommodations are required to take the placement exam(s) because of a disability, please contact the College to which you are interested in applying.

**INSTRUCTION, RESEARCH, AND STUDENT AFFAIRS**  
**APRIL 20, 2017**

---

~~COMPASS~~s Scores may also be used to determine placement eligibility for specific career technical programs.); and,

3) Satisfactory completion of high school coursework that includes at least the following:

a) *Mathematics -- 4 credits* (6 credits recommended) from challenging math sequences of increasing rigor selected from courses such as Algebra I, Geometry, Applied Math I, II, and III, Algebra II, Trigonometry, Discrete Math, Statistics, and other higher level math courses. Two (2) mathematics credits must be taken in the 11th or 12th grade. ~~(After 1998, less rigorous math~~mathematics ~~courses taken in grades 10-12 after 1998, such as pre-algebra, review math, and remedial math, shall not be counted.)~~

b) *Natural Science -- 4 credits* (6 credits recommended, with 4 credits in laboratory science) including at least 2 credits of laboratory science from challenging science courses including applied biology/chemistry, principles of technology (applied physics), anatomy, biology, earth science, geology, physiology, physical science, zoology, physics, chemistry, and agricultural science and technology courses (500 level and above).

c) ~~English--Secondary Language Arts and Communication~~ -- 8 credits. Applied English in the Workplace may be counted for English credit.

d) *Other -- Career technical courses*, including ~~courses eligible for dual credit~~postsecondary credits earned pursuant to Board Policy III.Y. Advanced Opportunities and organized work-based learning experiences connected to the school-based curriculum, are strongly recommended. ~~(High School Work Release time not connected to the school-based curriculum will not be considered.)~~

ii. Standards for others Seeking Regular Admission

Individuals who graduated from high school, received their GED prior to 1997, or who are at least 21 years old and who desire *Regular Admission* to the technical colleges must ~~complete~~have a:

1) High School diploma with a minimum 2.0 GPA; or

2) General Educational Development (GED) certificate<sup>3</sup>; and

---

<sup>3</sup>Certain institutions allow individuals who do not have a high school diploma or GED to be admitted if they can demonstrate the necessary ability to succeed in a technical program through appropriate tests or experiences determined by the institution.

**INSTRUCTION, RESEARCH, AND STUDENT AFFAIRS**  
**APRIL 20, 2017**

---

- 3) ~~Placement examination (CPT, ACT, COMPASS, SAT or other diagnostic/placement tests as determined by the institutions. CPT or ACT COMPASS scores may also be used to determine admission eligibility for specific career technical programs.)~~

~~409.~~ Career Technical ~~Conditional Provisional~~ Admission

Students who do not meet all ~~the~~ requirements for regular admission may apply to a technical program under ~~conditional provisional~~ admission. ~~Provisionally admitted~~ ~~Students who are conditionally admitted~~ must successfully complete appropriate remedial, general and/or technical education coursework related to the career technical program for which regular admission status is desired, and to demonstrate competence with respect to that program through methods and procedures established by the technical college. Students desiring ~~Provisional Conditional~~ Admission must ~~complete~~ have a:

- a. High School diploma or GED certificate<sup>3</sup>; and
- b. ~~Placement examination (CPT, ACT, COMPASS, SAT or other diagnostic/placement tests as determined by the institutions. CPT or ACT COMPASS scores may also be used to determine placement eligibility for specific career technical programs.)~~

~~11. Career Technical Early Admission~~

~~High school career technical dual credit students may also be admitted as non-degree seeking students. Placement exams are not required for regular or conditional admission until the student has completed the 12th grade.~~

~~4210.~~ Career Technical Placement Criteria: Procedures for placement into specific career technical programs

~~In addition to the requirements for admission to a technical program, students need to be aware that s~~Specific career technical programs may require different levels of academic competency in English, science and mathematics and admission requirements. Students must also be familiar with the demands of a particular occupation and how that occupation matches individual career interests and goals. Therefore, before students can enroll in a specific program, the following placement requirements must be satisfied:

- a. ~~Each technical program establishes s~~Specific program requirements (including placement exam scores) established by the technical program that must be met before students can enroll in those programs. A student who does not meet the established requirements for the program of choice will have the opportunity to participate in remedial education to improve their skills: and
- b. ~~Students should provide evidence of a career plan. (It is best if this plan is~~

**INSTRUCTION, RESEARCH, AND STUDENT AFFAIRS**  
**APRIL 20, 2017**

---

~~developed throughout high school prior to seeking admission to a technical college.)~~

~~e.b. Technical colleges employ f~~Formal procedures and definitions for program admission ~~employed by the technical college~~. Program admission requirements and procedures are clearly defined and published for each program.

**INSTRUCTION, RESEARCH AND STUDENT AFFAIRS**  
**APRIL 20, 2017**

---

**BOISE STATE UNIVERSITY**

**SUBJECT**

New Bachelor of Science in Engineering and Professional Fee

**APPLICABLE STATUTE, RULE, OR POLICY**

Idaho State Board of Education Governing Policies & Procedures, Section III.G. and Section V.R.3.b.iv.

**BACKGROUND/DISCUSSION**

Boise State University (BSU) proposes to create a new Bachelor of Science (BS) degree in Engineering. In addition, BSU proposes a professional fee of \$35 per credit for required upper division engineering courses for the new BS in Engineering.

The new program differs from existing baccalaureate engineering programs at BSU, ISU, and UI in that it will not have a specific disciplinary focus such as mechanical engineering, electrical engineering or civil engineering. Instead, the new program will enable students to earn an Accreditation Board for Engineering and Technology (ABET)-accredited engineering degree with the flexibility to incorporate an interdisciplinary curriculum tailored to students' professional goals. The program is a pathway for students to learn and apply engineering principles beyond the constraints of a traditional, discipline-focused degree program in engineering.

The need for engineers with a broad cross-section of skill-sets is championed by the American Society for Engineering Education (ASEE), who (with support from the National Science Foundation) is working with industry, government, and academic leaders to bridge the gap between engineering education and the needs of industry in the 21st century. Employers seek technically competent engineers, but additionally want engineers with workplace skills and disciplinary knowledge that transcend traditional discipline-specific engineering programs.

Graduates of the proposed program will be able to: (i) critically evaluate problems not only within, but also outside of, their domain expertise, (ii) communicate complex problems to colleagues, clients, and management across diverse cultures, and (iii) assimilate disparate and sometimes incomplete pieces of information to make informed business-forward decisions. Graduates will be prepared to enter the workforce in a variety of professions such as engineering, business, secondary education, and manufacturing as well as pursue professional degrees in fields such as medicine, law, architecture, and public administration.

The new program is broader and may appeal to a more diverse set of students than typical engineering programs and may result in more women and underrepresented minorities pursuing STEM professions. The program could also

**INSTRUCTION, RESEARCH AND STUDENT AFFAIRS**  
**APRIL 20, 2017**

---

hold appeal to veterans, many of whom have experience using advanced technologies and have the problem-solving skills necessary to be successful in engineering. Additionally, the new program will grant credit for prior learning that can be appropriately applied to professional electives.

Two new upper division courses will be created specifically for the new BS in Engineering. However, the remainder of required upper division engineering courses will be offered by the departments of Civil Engineering, Electrical and Computer Engineering, Mechanical and Biomedical Engineering, and Materials Science and Engineering. Note that these are the same departments that have other programs for which professional fees were approved in April 2016.

*Professional Fee Analysis*

Because of the high overlap in upper division coursework, to not charge a professional fee for the new BS in Engineering creates a situation that may create perceived inequities to students in other engineering programs for which professional fees are charged for the same required courses. Furthermore, concern is shared by the institution that a different fee structure could perpetuate behavior that would lead students to change majors in order to avoid fees. The basis for the request for a professional fee for the new BS in Engineering is the same as it was for the four programs considered by the Board in April 2016. At that time, the Board approved a professional fee in the amount of \$35 per credit for required upper division courses for baccalaureate programs offered by the departments of Civil Engineering, Electrical and Computer Engineering, Mechanical and Biomedical Engineering, and Materials Science and Engineering. Those reasons are as follows:

- Although professional licensure is not required to practice the engineering profession, particularly at entry levels, it is encouraged.
- The charging of a professional fee will enable BSU to avoid charging a course fee for the required courses.
- The cost of instruction is substantially higher in engineering programs because of high salaries of faculty members. The table below was presented to the Board in April, 2016. Note that the College of Business and Economics (COBE) is excluded because the faculty members there also have substantially higher salaries.

<b>Departmental Averages of Salaries</b>	<b>Assistant Professor</b>	<b>Associate Professor</b>	<b>Professor</b>
<b><i>Engineering: (Civil, ECE, MBE, MSE)</i></b>	\$83,653	\$89,062	\$107,268
Other Departments (Excludes COBE and CS)	\$57,757	\$65,963	\$80,544
Departments in COBE	\$106,525	\$103,011	\$105,191

- Graduates of engineering programs have high rates of employment and high average salaries, as can be seen in the following table, which also was presented to the board in April 2016.



**INSTRUCTION, RESEARCH AND STUDENT AFFAIRS**  
**APRIL 20, 2017**

---

<b>National Association of Colleges and Employers: January 2015 Salary Survey Projected Annual Salary for Baccalaureate Graduates</b>	
<b>Discipline</b>	<b>Average Annual Salary</b>
<b><i>Engineering</i></b>	<b><i>\$62,998</i></b>
Computer Science	\$61,287
Math & Sciences	\$56,171
Business	\$51,508
Agriculture & Natural Resources	\$51,220
Healthcare	\$50,839
Communications	\$49,395
Social Sciences	\$49,047
Humanities	\$45,042

Professional fees were not requested in April 2016 for two other baccalaureate programs offered by BSU's College of Engineering: (i) Computer Science has received substantial legislative support that has covered the high cost of the program, and (ii) Construction Management faculty members do not command the high salaries of engineering departments.

The professional fee charged to BS in Engineering students will be used in a similar manner to the fees charged to students in the already-approved engineering programs because (i) there is very high overlap in courses required by the programs and (ii) students in the new BS in Engineering will require the same degree of intensive advising, instructional support, etc., as students in the already-approved programs. The implementation of a professional fee will enable BSU to ensure that the new BS in Engineering is of high quality and that the students are successful. The following are examples of the ways in which the fees will be used:

- Adding teaching and learning assistants helps students succeed and graduate on time. In many cases, students avoid repeating courses if they have access to assistance early in the semester.
- Adding instructional capacity will enable BSU to keep pace with the enrollment growth and prevent bottlenecks from developing. The professional fee will enable BSU to maintain open enrollment in upper division courses.
- In some cases it is important to hire instructors with strong industry experience and contacts so as to improve the quality of instruction and better prepare students for careers in this field.
- Many of the required courses have a significant laboratory component, and the costs of equipment and personnel can be quite high.

**IMPACT**

BSU projects that the program will have approximately 100 juniors and seniors once up and running. The program requires 24 upper division credits of required

**INSTRUCTION, RESEARCH AND STUDENT AFFAIRS**  
**APRIL 20, 2017**

---

engineering coursework. Assuming that a junior or senior takes on average 6 upper division engineering credits per semester, the proposed professional fee would yield approximately \$21,000 per year. A student in the new program would pay an average of \$420 more per year in their upper division studies to obtain this degree.

The program will initially be resourced as follows:

- Much of the coursework will be provided using already-existing faculty members and coursework.
- One-time funds will be used for the first three years to hire one 0.75FTE clinical faculty line to serve a program director.
- In spring prior to the fourth year, permanent funding will be considered if it is warranted based on enrollments, however BSU anticipates that, at a minimum, one lecturer will be hired as a result of steady increases in enrollment.

The “Sunset Clause” for the BS in Engineering includes discontinuing the program if it does not achieve a minimum of 10 graduates per year within five or six years.

**ATTACHMENTS**

Attachment 1 –Bachelor of Science in Engineering Proposal

Page 7

**STAFF COMMENTS AND RECOMMENDATIONS**

Boise State University (BSU) proposes to create a new BS in Engineering and to include a professional fee of \$35 per credit for upper division Engineering courses required of that degree.

BSU’s proposed BS in Engineering is consistent with their service Region Program Responsibilities and their Five-Year Plan for Delivery of Academic Programs in Region III. Consistent with Board Policy III.Z, no institution has the statewide program responsibility for engineering programs. The proposed program falls within the mission of BSU, and is intended to create graduates who are prepared to work in a variety of professional occupations by drawing on engineering principles and skills as foundation. This differs from traditional discipline-specific programs leading to a career path in a specialized field of engineering. As a result, given the unique interdisciplinary nature of the program, students will need to be properly advised with respect to potential career options. The diverse range of applied curricula will also prepare students for a broad array of graduate study at all three Idaho universities, and, could help address industrial and technical needs in the region and state.

Professional Fee: With regard to the request for a professional fee to accompany this new engineering program, the Board may want to consider the following points:

- The criteria for establishing a professional fee for a program are listed in Board Policy V.R.3.B.iv. Key determinants include: whether the program

**INSTRUCTION, RESEARCH AND STUDENT AFFAIRS**  
**APRIL 20, 2017**

---

prepares its graduates for credentialing or licensing; and the program entails “extraordinary program costs” compared to other programs which don’t have professional fees; and the program “leads to a degree which provides at least the minimum capabilities required for entry” to the profession.

- Without additional coursework and training, graduates of this program would be less likely to attain the professional licensing/credentialing requirement than graduates of the four specific BSU engineering programs for which professional fees have been approved.
- Professional fees apply to specific students accepted in specific programs. BSU has the flexibility to allocate professional fees over specific courses which constitute these students’ programs rather than collecting the fee in single payments, but a professional fee is not a course fee, as defined in Board policy. The fact that it might be awkward to collect professional fees from some students enrolled in an authorized course—but not from others who may be taking the same course but who are not in the professional fee program—is not a compelling justification to collect professional fees from every student who may be taking a particular course, regardless of their program/major.
- Some of the shared courses which would be taken by the students in the proposed new program had course fees (which met Board criteria) prior to the recent establishment of professional fees, which then superseded all prior course fees. For high costs attributable to specific courses, this mechanism is still available to recoup delivery costs in lieu of a professional fee—though this would require the institution to separately track students in a given course who were in different program tracks, which is admittedly not as easy as assessing professional fees for all students in a given course or for all courses within the engineering discipline.
- The existing courses which would comprise the majority of the new generic engineering program appear to be financially sustainable at this point—due, in part, to the fact that professional fees (rather than course fees) are collected for students in these programs. Time will tell whether the new program would create bottlenecks in the existing programs or require significant investment in new personnel or facilities over and above the .75FTE program director and possibly an additional lecturer.
- If this program is deemed to warrant a professional fee by the Board, it would be hard to argue that every other engineering, business, or multi-disciplinary program which contains a number of high-cost courses would not also be eligible for professional fees—leading to a proliferation of professional fees (as quasi course fees) for programs which are not intimately linked to licensure/credentialing. Professional fees could become the rule rather than the exception—with the impact being a shift, by default, in the balance between finding additional funds to support quality programs and preserving access/affordability to students—an issue which merits deliberate and systematic analysis by the Board.

**INSTRUCTION, RESEARCH AND STUDENT AFFAIRS**  
**APRIL 20, 2017**

---

- Staff isn't in a position to comment on whether students would "game the system" by declaring the generic engineering major to bypass professional fees in the shared courses in approved programs, and then later switching to a traditional, rigorous engineering program leading to licensure. Hopefully, the "better angels" of character would prevail for both students and administrative staff in any circumstances, but the "gaming" concern is not one of the accepted rationales in Board policy for establishing professional fees.
- Finally, it should be noted that the Business Affairs and Human Resources (BAHR) committee polled the institutions on several occasions over the past year to provide the earliest possible notice of any anticipated new professional fee requests—and there were assurances that no such requests were in the pipeline for the FY2018 tuition/fee setting cycle. Staff did not become aware of this particular professional fee request until very late in the game, and has had limited time to work with BSU counterparts to analyze and assess the merits of this professional fee proposal, notwithstanding the possible merits of having an engineering program of this type for students with interests other than a traditionally-focused engineering degree.

The proposal went through the program review process and was recommended for approval by the Council on Academic Affairs and Programs (CAAP) on March 23, 2017 and was presented to the Instruction, Research, and Student Affairs (IRSA) committee on March 30, 2017 and to the Business Affairs and Human Resources Committee on April 7, 2017.

**BOARD ACTION**

I move to approve the request by Boise State University to create a new Bachelor of Science in Engineering in substantial conformance to the program proposal submitted as Attachment 1.

Moved by \_\_\_\_\_ Seconded by \_\_\_\_\_ Carried Yes \_\_\_\_\_ No \_\_\_\_\_

I move to approve the request by Boise State University to designate a professional fee for the Bachelor of Science in Engineering in the amount of \$35 per credit for upper division engineering courses required for the new program in conformance with the program budget submitted to the Board in Attachment 1.

Moved by \_\_\_\_\_ Seconded by \_\_\_\_\_ Carried Yes \_\_\_\_\_ No \_\_\_\_\_

APRIL 20, 2017

Institutional Tracking No.

17-002

## Idaho State Board of Education

### Proposal for Undergraduate/Graduate Degree Program

Date of Proposal Submission:	February 9, 2017
Institution Submitting Proposal:	Boise State University
Name of College, School, or Division:	College of Engineering
Name of Department(s) or Area(s):	Engineering Science

**Program Identification for Proposed New or Modified Program:**

Program Title:	B.S. in Engineering: either no emphasis or emphasis in secondary education				
Degree:		Degree Designation	<input checked="" type="checkbox"/>	Undergraduate	<input type="checkbox"/> Graduate
Indicate if Online Program:	<input type="checkbox"/> Yes		<input checked="" type="checkbox"/>	No	
CIP code (consult IR /Registrar):	14.0101 Engineering, General				
Proposed Starting Date:	Fall 2017				
Geographical Delivery:	Location(s)	Boise	Region(s)		
Indicate (X) if the program is/has:	<input type="checkbox"/> Self-Support		<input type="checkbox"/> Professional Fee		
Indicate (X) if the program is:	<input type="checkbox"/> Regional Responsibility		<input type="checkbox"/> Statewide Responsibility		

**Indicate whether this request is either of the following:**

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> New Degree Program                            | <input type="checkbox"/> Consolidation of Existing Program           |
| <input type="checkbox"/> Undergraduate/Graduate Certificates (30 credits or more) | <input type="checkbox"/> New Off-Campus Instructional Program        |
| <input type="checkbox"/> Expansion of Existing Program                            | <input type="checkbox"/> Other (i.e., Contract Program/Collaborative |

AS Muel 1/30/17  
 College Dean (Institution) Date

\_\_\_\_\_  
 Vice President for Research (as applicable) Date

\_\_\_\_\_  
 Graduate Dean (as applicable) Date

\_\_\_\_\_  
 Academic Affairs Program Manager, OSBE Date

\* Stacy Pearson 2/6/17  
 FVP/Chief Fiscal Officer (Institution) Date

\_\_\_\_\_  
 Chief Academic Officer, OSBE Date

Justin 2/2/17  
 Provost/VP for Instruction (Institution) Date

\_\_\_\_\_  
 SBOE/Executive Director Approval Date

[Signature] 2/8/17  
 President (Institution) Date

\* Please note that institutional funds are from College of Engineering. One time funds for 3 years and then submitted through a future budget request

IRSA TAB 4 Page 7

**Before completing this form, refer to Board Policy Section III.G., Postsecondary Program Approval and Discontinuance.** This proposal form must be completed for the creation of each new program. All questions must be answered.

### **Rationale for Creation or Modification of the Program**

- 1. Describe the request and give an overview of the changes that will result.** Will this program be related or tied to other programs on campus? Identify any existing program that this program will replace.

Boise State University proposes the creation of a program that will award a Bachelor of Science in Engineering degree that is broad-based and is not discipline-specific. The proposed program will enable students to earn an ABET-accredited engineering degree and to do so with the flexibility to incorporate an interdisciplinary curriculum tailored to their professional goals. The program will provide students with (i) a broad foundation in engineering principles, (ii) an in-depth understanding of an engineering discipline that meets their intellectual needs and (iii) the freedom to focus in an additional area of interest within, or external to, engineering.

This program will be a pathway for students to learn and apply engineering principles beyond the constraints of a traditional, discipline-focused degree program in engineering. For instance, a student seeking to teach engineering and/or math in high school could pursue the BS in Engineering with a secondary education emphasis. As another example, a student seeking to pursue a professional degree (such as in medicine, law, architecture, business, education, policy, or public administration) after their undergraduate coursework would be able to receive a BS in Engineering and also meet the entrance requirements of these professional programs. The quantitative, problem-solving skillset that comes with an engineering background will provide a unique perspective and competitive edge for students seeking advanced degrees or licensures within their professional field of interest.

The foundational engineering courses that students take for this degree are administered by the College of Engineering, and are the same courses that all students take in the engineering discipline-specific programs, i.e., civil engineering, electrical engineering, materials science and engineering, and mechanical engineering. Coursework that would be taken beyond the foundational engineering courses is already offered through other programs at Boise State.

- 2. Need for the Program.** Describe the student, regional, and statewide needs that will be addressed by this proposal and address the ways in which the proposed program will meet those needs.

A number of initiatives across the country are highlighting the need for engineers with a broad cross-section of skill-sets. The American Society of Engineering (ASEE), with support from the National Science Foundation, is working with industry, government, and academic leaders to bridge the gap between engineering education and the needs of industry in the 21st century. Local industry representatives participating in a Boise State-initiated Skills Summit echo the findings from the ASEE-sponsored Transforming Undergraduate Education in Engineering meetings and workshops: employers seek technically competent engineers and additionally want engineers with workplace skills that transcend traditional discipline-specific engineering programs. They seek engineers with the ability (i) to critically evaluate problems not only within, but also outside their domain expertise; (ii) to communicate complex problems to colleagues, clients, and management across diverse cultures; and (iii) to assimilate disparate and sometimes incomplete

**INSTRUCTION, RESEARCH AND STUDENT AFFAIRS**  
**APRIL 20, 2017**

pieces of information to make informed business-forward decisions. They seek confident, innovative, business-aware engineers with the depth and breadth of knowledge, both technical and professional, that enables progress in a rapidly changing technical landscape.

The transdisciplinary approach to engineering education afforded by the proposed B.S. in Engineering program provides students a platform for innovation and adaptability that employers seek. Students will gain the engineering background needed to solve technical problems and 21st century workplace skills. By leveraging the strengths, interests, and goals of each student in the program, we can design an engineering curriculum that is of value to a broad range of professions, including engineering, manufacturing, architecture, medicine, education, business, and law.

- a. Workforce need:** Provide verification of state workforce needs that will be met by this program. Include State and National Department of Labor research on employment potential. Using the chart below, indicate the total projected annual job openings (including growth and replacement demands in your regional area, the state, and nation. Job openings should represent positions which require graduation from a program such as the one proposed. Data should be derived from a source that can be validated and must be no more than two years old.

List the job titles for which this degree is relevant:

As noted above, the proposed BS in Engineering degree will produce graduates able to work in a wide variety of disciplines. It is therefore difficult to accurately estimate workforce need. Outside of engineering, career options for graduates from the B.S. in Engineering range from teachers, entrepreneurs, sales engineers, consultants, program managers, technical writers to healthcare and law professionals. A very conservative estimate of workforce need within engineering can be provided using two SOC categories from the US Bureau of Labor Statistics:

17-2112 Industrial Engineers  
 17-2199 Engineers, All Other

	State DOL data (for the two SOC codes listed)	Federal DOL data (for the two SOC codes listed)	Other data source: (describe)
<b>Local (Service Area)</b>	30 (1/2 of state)	29 (0.25% of national)	N/A
<b>State</b>	61	57 (0.5% of national)	N/A
<b>Nation</b>	N/A	11,480	N/A

Field	State DOL data		Federal DOL data	
	Annualized Growth	Annual Job Openings	Growth	Annual Job Openings
<b>Industrial Engineers</b>	2.1%	36	1.4%	8,180
<b>Engineering (other)</b>	2.3%	25	4%	3,300

**INSTRUCTION, RESEARCH AND STUDENT AFFAIRS  
APRIL 20, 2017**

Provide (as appropriate) additional narrative as to the workforce needs that will be met by the proposed program.

A wide variety of employment opportunities exist for a student graduating with a B.S. in Engineering. The proposed degree will provide a student with the potential to pursue a number of job positions that call for a B.S. in engineering such as manufacturing engineer, quality engineer, and process engineer. In addition graduating students will have an education that emphasizes technical problem solving providing an excellent foundation to pursue an advanced degree in law, healthcare, business, education, engineering, natural science fields, physical science fields, computational science and architecture.

- b. Student need.** What is the most likely source of students who will be expected to enroll (full-time, part-time, outreach, etc.)? Document student demand by providing information you have about student interest in the proposed program from inside and outside the institution. If a survey of s was used, please attach a copy of the survey instrument with a summary of results as **Appendix A**.

The proposed B.S. in Engineering will enable students interested in studying a field of engineering Boise State does not currently offer with an engineering degree that provides interdisciplinary flexibility. For example, if a student is interested in studying Industrial Engineering, they can obtain a B.S. in Engineering while taking relevant courses in supply chain management and mechanical engineering. Beyond engineering, by tailoring the curricula to align with student interests and career goals, students will have the flexibility to pursue a complimentary minor or certificate in a non-STEM field. This flexibility will enable graduates from this program to enter fields such as teaching, technical sales, program management, quality management, or public policy – just to name a few.

- c. Economic Need:** Describe how the proposed program will act to stimulate the state economy by advancing the field, providing research results, etc.

The proposed program will stimulate the state economy by producing a more skilled technical workforce for Idaho's high-tech companies, healthcare sector, state and federal government, engineering firms, non-profit sector, and businesses.

- d. Societal Need:** Describe additional societal benefits and cultural benefits of the program.

The proposed B.S. in Engineering has the potential to attract a more diverse group of students to engineering fields. With an expanded talent pool that represents the full cross-section of the social spectrum, a diverse set of skills, experiences, backgrounds and approaches to problem solving enable innovation - a critical component to long-term economic growth and global competitiveness.

The proposed degree's appeal to a more diverse set of students will play a crucial role in encouraging more women and underrepresented minorities to enter STEM professions. Nationwide this issue is recognized as one that must be addressed. By offering a more responsive and flexible engineering degree, Boise State will contribute to national efforts aimed at increasing the number of students that are traditionally underrepresented in STEM fields. For instance, in 2015 women represented 19.9% of the bachelor degrees awarded by engineering programs within the United States. However, environmental engineering programs had a much higher percentage (49.7%) of female graduates. The flexibility of the B.S. in Engineering can provide the



**INSTRUCTION, RESEARCH AND STUDENT AFFAIRS  
APRIL 20, 2017**

professional skills and competencies in engineering areas (such as environmental engineering, biomedical engineering, and industrial engineering) that typically have a relatively higher percentage of female graduates as compared to the national average.

In addition to serving traditionally underrepresented groups within STEM professions, this program has the capacity to be a resource for veterans. Many veterans return from deployment with experience using advanced technologies and the problem-solving skills necessary to be successful in engineering. Often veterans arrive at college under-prepared in math, that is, not ready for Calculus. The flexibility in this degree allows these students to still complete the degree in four years. In addition, some of the credits earned while in the service will count towards the professional electives. Therefore the B.S. in Engineering program will provide them with a degree that leverages the skills gained in their service.

**e. If Associate's degree, transferability:**

N/A

**3. Similar Programs.** Identify similar programs offered within Idaho and in the region by other in-state or bordering state colleges/universities.

No other public institution of higher education in Idaho offers an ABET accredited B.S. in Engineering degree program. Instead, they offer programs with specific, traditional concentrations.

- University of Idaho offers bachelor's degrees in Agricultural Engineering, Biological Systems Engineering, Chemical Engineering, Materials Science and Engineering, Metallurgical Engineering, Civil Engineering, Geological Engineering, Electrical Engineering, and Mechanical Engineering.
- Idaho State University offers bachelor's degrees in Civil Engineering, Nuclear Engineering, Electrical Engineering, and Mechanical Engineering.

Similar Programs offered <u>by Idaho public institutions</u> (list the proposed program as well)		
Institution Name	Degree name and Level	Program Name and brief description if warranted
Boise State University	BS	Engineering

There are no similar programs in Idaho or adjacent states. The following list, however, is provided to give an idea of what is offered in other parts of the US.

**INSTRUCTION, RESEARCH AND STUDENT AFFAIRS  
APRIL 20, 2017**

<b>Similar Programs offered <u>by other Idaho institutions and by institutions in nearby states</u></b>		
<b>Institution Name</b>	<b>Degree name and Level</b>	<b>Program Name and brief description if warranted</b>
Olin College of Engineering	BS Engineering	Students can design their own degree program by choosing a set of classes that, along with the college-wide requirements, make up a coherent plan of study. Popular areas of concentration include BioEngineering, Computing, Design, and Robotics.
Purdue University	BS Multi-disciplinary Engineering	The Multidisciplinary Engineering Program's mission, goals, objectives and outcomes are designed to prepare graduates to practice engineering. Typically, a plan of study is developed around a focused concentration. The student may develop their own individual plan of study or select one of the established concentrations.
University of Colorado Boulder	BS in Engineering Plus	Engineering Plus is a degree program in the College of Engineering and Applied Science at CU Boulder. An e+ degree prepares students for a broad range of exciting professional careers and for graduate study in a wide variety of disciplines. Engineering Plus students take Foundational coursework, study Engineering Core courses, select an e+ Emphasis, and choose an e+ Concentration.
Arizona State University	BS in Engineering	The bachelor of science in Engineering is a project-based, hands-on program for creative engineers who want to design innovative solutions to current and future challenges to improve the lives of others. Students gain a broad foundation in engineering as well as an in-depth understanding of an engineering concentration area—automotive, electrical, environmental, humanitarian, mechanical or robotics. Students have the flexibility to tailor the program of study to achieve career and life goals that may extend beyond traditional engineering.

**Justification for Duplication with another institution listed above.** (if applicable). If the proposed program is similar to another program offered by an Idaho public institution, provide a rationale as to why any resulting duplication is a net benefit to the state and its citizens. Describe why it is not feasible for existing programs at other institutions to fulfill the need for the proposed program.

N/A: there are no similar programs at other institutions

**INSTRUCTION, RESEARCH AND STUDENT AFFAIRS**  
**APRIL 20, 2017**

4. **Describe how this request supports the institution's vision and/or strategic plan.**

Goals of Institution Strategic Mission	Proposed Program Plans to Achieve the Goal
Goal 1: Create a signature, high quality educational experience for all students.	- Provide a flexible, accredited engineering education with transdisciplinary reach that meets student goals and stakeholder needs.
Goal 2: Facilitate the timely attainment of educational goals of our diverse student population.	- Program flexibility enables students to strategically map out streamlined curricula to meet their educational needs.
Goal 4: Align university programs and activities with community needs.	- The proposed B.S. in Engineering has the potential to attract a more diverse group of students to fields that require a skilled technical workforce.

5. **Assurance of Quality.** Describe how the institution will ensure the quality of the program. Describe the institutional process of program review. Where appropriate, describe applicable specialized accreditation and explain why you do or do not plan to seek accreditation.

The following measures will ensure the high quality of the new program:

Regional Institutional Accreditation: Boise State University is regionally accredited by the Northwest Commission on Colleges and Universities (NWCCU). Regional accreditation of the university has been continuous since initial accreditation was conferred in 1941. Boise State University is currently accredited at all degree levels (A, B, M, D).

ABET Accreditation: The B.S. in Engineering program will seek ABET accreditation through the Engineering Accreditation Commission. The Engineering Accreditation Commission of ABET is the global standard for assuring technical education in science and engineering meets the quality standards set forth by industry, government, and academic stakeholders. All engineering programs as well as the computer science program at Boise State are ABET accredited. ABET accreditation demonstrates a commitment to delivering quality education that is recognized and sought out by both students and employers.

By meeting the eligibility requirements set forth by ABET, the B.S. in Engineering program will formally request an accreditation review by the Engineering Accreditation Commission upon graduating its first student. In anticipation of the accreditation evaluation, the program will follow similar self-assessment and continuous improvement procedures advanced by the ABET-accredited programs (Civil Engineering, Computer Science, Electrical Engineering, Materials Science and Engineering, Mechanical Engineering) in the College of Engineering.

6. **In accordance with Board Policy III.G., an external peer review is required for any new doctoral program.** Attach the peer review report as **Appendix B**.

N/A

7. **Teacher Education/Certification Programs.** All Educator Preparation programs require review from the Professional Standards Commission (PSC) and approval from the Board. In addition to the proposal form, the Program Approval Matrix (**Appendix C**) is required for any new and modifications to teacher education/certification programs, including endorsements. The matrix must be submitted with the proposal to OSBE and SDE using the online academic program system as one document.

N/A

**INSTRUCTION, RESEARCH AND STUDENT AFFAIRS  
APRIL 20, 2017**

8. **Five-Year Plan:** Is the proposed program on your institution's approved 5-year plan? Indicate below.

Yes   X   No       

**Curriculum, Intended Learning Outcomes, and Assessment Plan**

9. **Curriculum for the proposed program and its delivery.**

- a. **Summary of requirements.** Provide a summary of program requirements using the following table.

University Core (24-25 cr) not including Math and Science.

A total of 24 credits of literature and humanities (3-4 cr), social science (6 cr), visual and performance arts (3 cr), reading, writing an inquiry (6 cr), and intellectual, civic and ethical foundations (6 cr) coursework that is common to all students at Boise State University.

Math and Basic Science Core (33 cr) including Math and Science required for University Core

The curriculum includes 19 credits of mathematics (calculus I-III, differential equations, and engineering statistics) and 14 credits of basic science (one semester of general chemistry and two semesters of calculus-based physics) coursework that provides the fundamental knowledge and skills needed to progress in an engineering curricula.

Engineering Principles (28-29 cr)

Students build upon fundamental math and science knowledge with 28-29 credits of engineering courses. These courses are common to all students in the B.S. in Engineering program and provide students a strong foundation in engineering science and design concepts needed to solve technical problems, and the technical breadth needed to engage in a broad range of engineering disciplines.

Engineering Focus (18 cr)\*

A total of 18 credits of upper-division engineering courses are required for the engineering emphasis. The courses eligible to fulfill this degree requirement can align with a traditional engineering discipline or they can be drawn from a variety of engineering disciplines to create a customized curriculum emphasizing a technically relevant engineering focus area.

Professional Focus (18 cr)\*

The professional focus requirement is fulfilled by completing 18 credits of coursework, 12 of which must be upper-division, (i) related to the engineering emphasis, (ii) associated with pre-professional requirements for advanced study, (iii) aligned with a minor or secondary education emphasis, or (iv) emphasizing a professional field of interest.

\*An approved curriculum plan must be submitted and approved by the engineering program coordinator before enrolling in any of the focus courses.

**INSTRUCTION, RESEARCH AND STUDENT AFFAIRS  
APRIL 20, 2017**

Credit hours in required courses offered by the department (s) offering the program; includes all engineering and computer science courses, and includes 18 upper division engineering electives	46-47
Credit hours in required courses offered by other departments (outside of general education)	38
Credit hours in institutional general education curriculum	37-38
Credit hours in free electives	0
Total credit hours required for degree program:	121-123

- b. Additional requirements.** Describe additional requirements such as comprehensive examination, senior thesis or other capstone experience, practicum, or internship, some of which may carry credit hours included in the list above.

Capstone Sequence (6 cr) ENGR 481, 483 Engineering Senior Design I & II is an interdisciplinary capstone sequence integrating engineering principles with professional interests to solve an open-ended technical problem.

**10. Program Intended Learning Outcomes and Connection to Curriculum.**

- a. Intended Learning Outcomes.** List the Intended Learning Outcomes for the proposed program, using learner-centered statements that indicate what will students know, be able to do, and value or appreciate as a result of completing the program.

The program's student outcomes are based on ABET defined outcomes (a) through (k):

- (a) an ability to apply knowledge of mathematics, science, and engineering
- (b) an ability to design and conduct experiments, as well as to analyze and interpret data
- (c) an ability to 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
- (d) an ability to function on multidisciplinary teams
- (e) an ability to identify, formulate, and solve engineering problems
- (f) an understanding of professional and ethical responsibility
- (g) an ability to communicate effectively
- (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- (i) a recognition of the need for, and an ability to engage in life-long learning
- (j) a knowledge of contemporary issues
- (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

**11. Assessment plans**

- a. Assessment Process.** Describe the assessment process that will be used to evaluate how well students are achieving the intended learning outcomes of the program.

The B.S. in Engineering program will follow a systematic assessment and improvement process in which multiple approaches will be used, not only to measure student attainment of program outcomes, but to also inform programmatic improvements.

The learning outcomes are mapped to courses that provide relevant content. Student work in these courses that address specific outcomes is collected and evaluated by program faculty. The

**INSTRUCTION, RESEARCH AND STUDENT AFFAIRS**  
**APRIL 20, 2017**

outcomes are assessed on a three-year cycle with three or four outcomes assessed each year. For each outcome, student work across the program is reviewed in a comprehensive review of student work. A group of three faculty members and instructors review the overall attainment of the outcome based on the evidence collected. As part of the review, recommendations for improvement to the program are outlined. Evaluation results inform programmatic, pedagogical, and curricular improvements.

- b. Closing the loop.** How will you ensure that the assessment findings will be used to improve the program?

Continuous improvement of academic programs is part of the underlying philosophy of the college of engineering. To facilitate the assessment process for each undergraduate program, an accreditation committee is appointed annually by the dean, containing a representative from each program. The committee meets approximately 6 times per year; leadership of this meeting is the responsibility of the associate dean. Program representatives to the committee are responsible for submitting an annual assessment report detailing student attainment of learning outcomes.

During accreditation committee meetings, assessment results are presented by each program. A committee discussion follows, and the feedback generated is used to help improve the report and the program's assessment processes. At the end of the academic year, the associate dean compiles all minutes of the accreditation committee into a single document that is sent to the dean, and puts all annual assessment reports into an electronic archive.

The combination of programmatic reviews and college level reviews along with the ABET general review cycle ensures that assessment findings will be used to inform programmatic improvements.

- c. Measures used.** What direct and indirect measures will be used to assess student learning?

Direct Measures: Student work that aligns with specific outcomes will be collected and evaluated by program faculty. A comprehensive review of student work will be completed for each outcome once every three years.

Indirect Measures: A senior exit survey with questions related to student outcomes will be administered to graduating seniors at the end of each semester. The survey contains questions designed to elicit feedback regarding their perceived achievement of each outcome and their perception of how important they feel each outcome is to their future career. Students completing the program will be encouraged to take the Fundamentals of Engineering exam administered by NCEES (National Council of Examiners for Engineering and Surveying).

- d. Timing and frequency.** When will assessment activities occur and at what frequency?

Assessment activities will occur throughout the academic year. Comprehensive Review of Student work will occur annually. The program faculty and instructors will review assessment on an annual basis and create an action plan for any corrective actions that are needed.

**INSTRUCTION, RESEARCH AND STUDENT AFFAIRS  
APRIL 20, 2017**

**Enrollments and Graduates**

- 12. Existing similar programs at Idaho Public Institutions.** Using the chart below, provide enrollments and numbers of graduates for similar existing programs at your institution and other Idaho public institutions.

Existing Similar Programs: Historical enrollments and graduate numbers								
Institution and Program Name	Fall Headcount Enrollment in Program				Number of Graduates From Program			
	FY14	FY15	FY16	FY17	FY13	FY14	FY15	FY16
<b>BSU</b> (programs in Civil Engr, Electrical and Computer Engr, Mechanical & Biomedical Engr, Materials Science & Engr)	1504	1507	1537	1431	142	159	162	170
<b>ISU</b> (programs in Civil Engr, Electrical Engr, Mechanical Engr & Nuclear Engr)	745	1018	1019	712	62	46	50	72
<b>UI</b> (Agricultural Engr, Biological Systems Engr, Biological Engr, Chemical Engr, Materials Science & Engr, Civil Engr, Metallurgical Engr, Geological Engr, Electrical Engr, Computer Engr & Mechanical Engr)	1210	1264	1246	1260	156	221	160	180

- 13. Projections for proposed program:** Using the chart below, provide projected enrollments and number of graduates for the proposed program:

Proposed Program: Projected Enrollments and Graduates First Five Years											
Program Name: BS in Engineering											
Projected Fall Term Headcount Enrollment in Program						Projected Annual Number of Graduates From Program					
FY18 (first year)	FY19	FY20	FY21	FY22	FY23	FY18 (first year)	FY19	FY20	FY21	FY22	FY23
25	50	75	100	100	100	0	0	4	8	12	16

- 14. Describe the methodology for determining enrollment and graduation projections.** Refer to information provided in Question #2 "Need" above. What is the capacity for the program? Describe your recruitment efforts? How did you determine the projected numbers above?

We used numbers that roughly approximate those of our most recently created BS in Engineering program: the BS in Materials Science and Engineering.

**INSTRUCTION, RESEARCH AND STUDENT AFFAIRS  
APRIL 20, 2017**

- 15. Minimum Enrollments and Graduates.** Have you determined minimums that the program will need to meet in order to be continued? What are those minimums, what is the logical basis for those minimums, what is the time frame, and what is the action that would result?

During Program Prioritization, Boise State University established a threshold of 10 baccalaureate graduates per year per program; numbers below that threshold are unacceptable would require remediation or discontinuation.

For the proposed program, we also have more specific criteria. We plan to fund the program using one-time funds for the first three years. If, by the end of the third year, the program does not generate sufficient revenue to warrant investment of permanent funds, then the program will be discontinued.

**Resources Required for Implementation – fiscal impact and budget**

- 16. Physical Resources.**

- a. Existing resources.** Describe equipment, space, laboratory instruments, computer(s), or other physical equipment presently available to support the successful implementation of the program.

No additional facility-based resources are needed for the implementation of this program.

- b. Impact of new program.** What will be the impact on existing programs of increased use of physical resources by the proposed program? How will the increased use be accommodated?

Due to the modest enrollment numbers anticipated for the start of this program, no impact is anticipated for lower-division required courses. That, and the flexibility of the upper-division curriculum buffers the potential for any class room capacity issues.

- c. Needed resources.** List equipment, space, laboratory instruments, etc., that must be obtained to support the proposed program. Enter the costs of those physical resources into the budget sheet.

N/A

- 17. Library resources**

- a. Existing resources and impact of new program.** Evaluate library resources, including personnel and space. Are they adequate for the operation of the present program? Will there be an impact on existing programs of increased library usage caused by the proposed program? For off-campus programs, clearly indicate how the library resources are to be provided.

No impact is anticipated.

- b. Needed resources.** What new library resources will be required to ensure successful implementation of the program? Enter the costs of those library resources into the budget sheet.

N/A



**18. Personnel resources**

- a. Needed resources.** Give an overview of the personnel resources that will be needed to implement the program. How many additional sections of existing courses will be needed? Referring to the list of new courses to be created, what instructional capacity will be needed to offer the necessary number of sections?

One new position will be required beginning with the first year of the program: 0.75 FTE for a clinical faculty member would act as director and will be responsible for administering the program: from managing the ABET-accreditation process, student support services and enrollment to developing, maintaining and strengthening stakeholder relationships. We anticipate that if the program is successful, additional instructional resources will be required; therefore, as a reasonable middle ground, the budget depicts one lecturer being hired in the fourth year of the program.

- b. Existing resources.** Describe the existing instructional, support, and administrative resources that can be brought to bear to support the successful implementation of the program.

The administrative staff within the College of Engineering (this includes advising, accounting, facility management, information technology and marketing personnel) are available to support program operations. As 92.5% of the credits needed to meet degree requirements are for courses already offered at Boise State, no additional instructors will be needed initially to support of this program. For the three new courses (ENGR 280, ENGR 481 and ENGR 483), the teaching load will be distributed within the college.

- c. Impact on existing programs.** What will be the impact on existing programs of increased use of existing personnel resources by the proposed program? How will quality and productivity of existing programs be maintained?

Day-to-day activities will be maintained within the college by existing personnel with the support of one new FTE to administer the program. Productivity and quality is assured through the ABET-accreditation process.

We may see a drop in enrollment in one or more of our existing baccalaureate programs. However, all but one program (materials science and engineering) are at capacity or above capacity, and therefore each will maintain viable enrollments once the proposed program is implemented.

- d. Needed resources.** List the new personnel that must be hired to support the proposed program. Enter the costs of those personnel resources into the budget sheet.

Year one: 0.75 FTE – Clinical faculty member acting as Engineering Program Coordinator  
Year four: 1.0 FTE – Lecturer position.

**19. Revenue Sources**

- a) **Reallocation of funds:** If funding is to come from the reallocation of existing state

**INSTRUCTION, RESEARCH AND STUDENT AFFAIRS  
APRIL 20, 2017**

appropriated funds, please indicate the sources of the reallocation. What impact will the reallocation of funds in support of the program have on other programs?

The institution will use one-time funds for first three years. In spring prior to fourth year, we will consider (via the university's budget process) whether permanent funding is warranted based on enrollments. We make the assumption here that the program is sufficiently successful.

- b) **New appropriation.** If an above Maintenance of Current Operations (MCO) appropriation is required to fund the program, indicate when the institution plans to include the program in the legislative budget request.

N/A

- c) **Non-ongoing sources:**

- i. If the funding is to come from one-time sources such as a donation, indicate the sources of other funding. What are the institution's plans for sustaining the program when that funding ends?
- ii. Describe the federal grant, other grant(s), special fee arrangements, or contract(s) that will be valid to fund the program. What does the institution propose to do with the program upon termination of those funds?

N/A

- d) **Student Fees:**

- i. If the proposed program is intended to levy any institutional local fees, explain how doing so meets the requirements of Board Policy V.R., 3.b.

The SBOE recently approved \$35 per credit of professional fees for upper division engineering courses at Boise State.

- ii. Provide estimated cost to students and total revenue for self-support programs and for professional fees and other fees anticipated to be requested under Board Policy V.R., if applicable.

Students will be required to take a minimum of 24 credits of upper division engineering coursework to complete the degree. That 24 credits, at \$35 per credit, would cost the student \$840.

20. Using the budget template provided by the Office of the State Board of Education, provide the following information:

**INSTRUCTION, RESEARCH AND STUDENT AFFAIRS  
APRIL 20, 2017**

I. PLANNED STUDENT ENROLLMENT			FY 18		FY 19		FY 20		FY 21	
			FTE	Headcount	FTE	Headcount	FTE	Headcount	FTE	Headcount
	A. New enrollments		19	19	38	38	56	56	75	75
	B. Shifting enrollments		6	6	13	13	19	19	25	25
	Total Enrollments			25		50		75		100
II. REVENUE			FY 18		FY 19		FY 20		FY 21	
			On-going	One-time	On-going	One-time	On-going	One-time	On-going	One-time
	1. New Appropriated Funding Request		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
	2. Institution Funds		\$0	\$60,165		\$61,603		\$58,092	\$127,332	
	3. Federal		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
	4. New Tuition Revenues from Increased Enrollments		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
	5. Student Fees		\$0	\$5,250	\$0	\$10,500	\$0	\$15,750	\$0	\$21,000
	6. Other (i.e., Gifts)		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
	<b>Total Revenue</b>		<b>\$0</b>	<b>\$65,415</b>	<b>\$0</b>	<b>\$72,103</b>	<b>\$0</b>	<b>\$73,842</b>	<b>\$127,332</b>	<b>\$21,000</b>
<b>Not included as revenue</b>										
	New Tuition Revenues from Increased Enrollments		\$41,250	\$0	\$82,500	\$0	\$123,750	\$0	\$165,000	\$0
Assumes 1/4 of enrollments are new to university; 30 SCH per student per year; \$220 per SCH										
Not included in "revenue" because program is neither self support nor online program fee model; thus tuition flows to centra funds not to the specific program.										
Budget Notes:										
I.A.,B.	Assume 25% of enrollments in the program have shifted to new program from existing programs. Assume most students are full-time; thus FTE = Headcount									
II.2.	Institution will use one-time funds for first three years. In spring prior to fourth year, institution will consider (via budget process) whether the the (i) permanent funding of the director position and (ii) funding of additional instructional capacity are warranted based on enrollments. Assume here that both are justified and approved via the university's budget process.									
II.4	"New tuition revenues from increased enrollments" are not included in "Revenue" because tuition from students in traditionally-funded programs does not flow to the program but instead flows to Central, and is therefore accounted for in "2. Institution Funds"									
II.5.	Estimated revenue from student fees charged for all upper division engineering courses. Curriculum requires 24 credits of upper division engineering credits. Assume those 24 credits are equally distributed across the four semesters of junior and senior year, that half of enrollment consists of juniors and seniors, that each student takes 30 credits per year, and that roughly \$220 is generated per SCH.									

**INSTRUCTION, RESEARCH AND STUDENT AFFAIRS**  
**APRIL 20, 2017**

III. EXPENDITURES										
			FY 18		FY 19		FY 20		FY 21	
			On-going	One-time	On-going	One-time	On-going	One-time	On-going	One-time
<b>A. Personnel Costs</b>										
1. FTE			0.75	-	0.75	-	0.75	-	1.75	
2. Faculty			\$0	\$0	\$0	\$0	\$0	\$0	\$50,000	\$0.00
3. Adjunct Faculty			\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0.00
4. Grad Assts			\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0.00
5. Research Personnel			\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0.00
6. Directors/Administrators			\$46,500	\$0	\$47,895	\$0	\$49,332	\$0	\$50,812	\$0.00
7. Administrative Support Personnel			\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0.00
8. Fringe Benefits			\$18,915	\$0	\$19,208	\$0	\$19,510	\$0	\$42,520	\$0.00
9. Other:										
<b>Total Personnel and Costs</b>			<b>\$65,415</b>	<b>\$0</b>	<b>\$67,103</b>	<b>\$0</b>	<b>\$68,842</b>	<b>\$0</b>	<b>\$143,332</b>	<b>\$0.00</b>
III.2.	Assume that enrollments are sufficient to hire a new lecturer position in fourth year of program									
III.6.	Program Director will hold clinical faculty status for a 9 month contract, and will devote 0.75 of that 9 month position to the proposed program.									
III.8.	Fringe benefits calculated as (salary*.21 +12,200)									

**INSTRUCTION, RESEARCH AND STUDENT AFFAIRS  
APRIL 20, 2017**

		FY 18		FY 19		FY 20		FY 21	
		On-going	One-time	On-going	One-time	On-going	One-time	On-going	One-time
<b>B. Operating Expenditures</b>									
1. Travel		\$0	\$0	\$2,500	\$0	\$2,500	\$0	\$2,500	\$0
2. Professional Services		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3. Other Services		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4. Communications		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
5. Materials and Supplies		\$0	\$0	\$2,500		\$2,500	\$0	\$2,500	\$0
6. Rentals		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7. Materials & Goods for Manufacture & Resale		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8. Miscellaneous		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>Total Operating Expenditures</b>		<b>\$0</b>	<b>\$0</b>	<b>\$5,000</b>	<b>\$0</b>	<b>\$5,000</b>	<b>\$0</b>	<b>\$5,000</b>	<b>\$0</b>

**INSTRUCTION, RESEARCH AND STUDENT AFFAIRS**  
**APRIL 20, 2017**

		FY 18		FY 19		FY 20		FY 21	
		On-going	One-time	On-going	One-time	On-going	One-time	On-going	One-time
	<b>C. Capital Outlay</b>								
	1. Library Resources	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
	2. Equipment	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
	<b>Total Capital Outlay</b>	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
	<b>D. Capital Facilities Construction or Major Renovation</b>								
	<b>E. Indirect Costs (overhead)</b>								
	Utilities								
	Maintenance & Repairs								
	Other								
	<b>Total Indirect Costs</b>	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
	<b>TOTAL EXPENDITURES:</b>	\$65,415	\$0	\$72,103	\$0	\$73,842	\$0	\$148,332	\$0
	<b>Net Income (Deficit)</b>	-\$65,415	\$65,415	-\$72,103	\$72,103	-\$73,842	\$73,842	-\$21,000	\$21,000
	<b>Net Income (Deficit) with onetime and ongoing combined</b>	<b>\$0</b>		<b>\$0</b>		<b>\$0</b>		<b>\$0</b>	

**INSTRUCTION, RESEARCH AND STUDENT AFFAIRS  
APRIL 20, 2017**

**Appendix A: Curriculum**

<b>Engineering, B.S.</b>	
<i>Course Number and Title</i>	<i>Credits</i>
Foundational Studies Program requirements indicated in <b>bold</b> .	
<b>ENGL 101</b> Introduction to College Writing	3
<b>ENGL 102</b> Intro to College Writing and Research	3
<b>UF 100</b> Intellectual Foundations	3
<b>UF 200</b> Civic and Ethical Foundations	3
<b>DLM</b> MATH 170 Calculus I	4
<b>DLN</b> CHEM 111, 111L General Chemistry I & Lab	4
<b>DLN</b> PHYS 211, 211L Physics I with Calculus & Lab	5
<b>DLV</b> Visual and Performing Arts	3
<b>DLL</b> Literature and Humanities or <b>DLL</b> STEM-ED 220: Perspectives on Science and Mathematics (Secondary Education Emphasis)	3-4
<b>DLS</b> Social Sciences or <b>DLS</b> STEM-ED 210: Knowing and Learning in Mathematics and Science (Secondary Education Emphasis)	3
<b>DLS</b> Social Sciences course in a second field or <b>DLS</b> ED-CIFS 201 Foundations of Education (Secondary Education Emphasis)	3
CS 117 C++ for Engineers or CS 111 Introduction to Programming	3
ENGR 120 Intro To Engineering or ENGR 130 Intro to Engineering Applications	3-4
ENGR 210 Engineering Statics	3
ENGR 240 Electrical and Electronic Circuits or ECE 210 Circuits I	3
<b>CID</b> ENGR 280 Introduction to Engineering Design	3
<b>FF</b> ENGR 481, 483 Engineering Senior Design I & II	6
MATH 175 Calculus II	4
MATH 275 Calculus II	4
MATH 333 Differential Equations	4
MATH 360 Engineering Statistics or MATH 361 Probability and Statistics I	3
ME 105 Mechanical Engineering Graphics	3
MSE 245, 245L Introduction to Materials Science & Engineering & Lab	4
PHYS 212, 212L Physics II with Calculus & Lab	5
Engineering Focus: Upper Division <b>Engineering</b> Electives (must be approved by advisor)	18
Professional Focus, 12 credits of which must be upper-division (all courses must be approved by advisor); completing the Secondary Education Emphasis is one alternative.	18
<i>Total</i>	121-123

**INSTRUCTION, RESEARCH AND STUDENT AFFAIRS**  
**APRIL 20, 2017**

**Examples of alternatives for “Professional Focus”**

<b>IDoTeach Secondary Education Emphasis</b>	
STEM-ED STEP 1 Inquiry Approaches to Teaching	1
STEM-ED STEP 2 Inquiry Based Lesson Design	1
STEM-ED 310 Classroom Interactions	3
STEM-ED 350: Research Methods (Secondary Education Emphasis)*	3
STEM-ED 410: Project-Based Instructions (Secondary Education Emphasis)*	3
STEM-ED 480 Apprentice Teaching	6
Elective	1
Total	18
Students pursuing this emphasis also need to complete ED-CIFS 201, STEM-ED 210, STEM-ED 220, which can be accomplished in fulfilling Foundational Studies Program Requirements for DLS and DLL courses	

<b>Pre-Medical Focus</b>	
BIOL 191, 192 General Biology I and II	8
CHEM 112, 112L General Chemistry II & Lab	4
CHEM 307, 308, 309, 310 Organic Chemistry I & II with Labs	10
CHEM 350 Fundamentals of Biochemistry	3
TOTAL	25

*NOTE: Psychology and/or Sociology recommended for DLS courses to aid in Psychological, Social and Biological Foundation of Behavior section on MCAT*

<b>Environmental Studies Focus via the Environmental Studies Minor</b>	
ENVST 121 Introduction to Environmental Studies	3
GEOG 100 Introduction to Geography	3
ANTH 314* Environmental Anthropology or BIOL 323* Ecology or GEOG 321* Conservation of Natural Resources	3-4
ECON 333* Natural Resource Economics or HIST 376 Global Environmental History or HIST 351 North American Environmental History or POLS 409* Environmental Politics	3
Choose 8 credits from the following: BIOL 191 General Biology I BIOL 192 General Biology II CHEM 101, 101L Essentials of Chem I & Lab CHEM 102, 102L Essentials of Chem II & Lab CHEM 111, 111L General Chemistry I & Lab CHEM 112, 112L General Chemistry II & Lab ENVHLTH 102 Global Environmental Health GEOS 101 Global Environmental Science	8



**INSTRUCTION, RESEARCH AND STUDENT AFFAIRS  
APRIL 20, 2017**

Choose 6 credits from the following: ANTH 314 Environmental Anthropology BIOL 323* Ecology BIOL 422* Conservation Biology CHEM 211*, 212* Analytical Chemistry I & Lab CHEM 301* Survey of Organic Chemistry CE 320* Principles of Environmental Engineering (CE 321 Principles of Environmental Engineering is optional) ECON 322* Urban Economics ENVHLTH 310* Water Supply and Water Quality Management ENVHLTH 417* Principles of Toxicology ENVHLTH 442 Hazardous Waste Management ENVHLTH 450 Environmental Health Law ENVHLTH 480* Air Quality Management GEOG 321 Conservation of Natural Resources GEOS 212* Water in the West GEOS 426* Aqueous Geochemistry HIST 351 North American Environmental History HIST 376 Global Environmental History SOC 440 Environmental Sociology (Courses used to satisfy requirements in previous sections may not be used to satisfy the 6 credits required in this section)	6
TOTAL	26-27

THIS PAGE INTENTIONALLY LEFT BLANK