A 3-2 PROGRAM OF COLLEGIATE EDUCATION

in

LIBERAL ARTS AND SCIENCE
AND ENGINEERING

at

LOCK HAVEN UNIVERSITY OF PENNSYLVANIA
AND

THE PENNSYLVANIA STATE UNIVERSITY

October 2009
A. INTRODUCTION

Lock Haven University of Pennsylvania and the Colleges of Engineering and Earth and Mineral Sciences of The Pennsylvania State University agree to establish an educational program in liberal arts and sciences and engineering. Three years, or the equivalent, will be spent by a participating student at Lock Haven University of Pennsylvania, where the student will study liberal arts and science subjects along with pre-engineering courses. Upon satisfactory completion of the first three years, the student will enter the Pennsylvania State University and complete the engineering major degree requirements. A successful completion of these programs will lead to an appropriate baccalaureate degree from each institution. Such a cooperative program is being created in an effort to fulfill the following objectives:

i. To cooperatively provide a general education in liberal arts and sciences, as well as engineering education for each student enrolled, so that through approximately five years of study, depending on the major and completion of recommended courses, a student may complete what otherwise could require six or more years.

ii. To provide a student who has not yet decided between engineering and other disciplines, additional time to make that decision while the student studies both arts and sciences during the first three years at Lock Haven University of Pennsylvania.

iii. To enable The Pennsylvania State University to attract a more diverse population to its engineering programs.

iv. To enable qualified students to receive both a liberal and technical education and, in so doing, provide the Commonwealth and the Nation with more broadly educated engineers.

B. PROCEDURES

Admission and the transfer of students in this 3-2 cooperative program will be through the application of the following procedures and policies:

1. Application for admission to the program will be made to Lock Haven University of Pennsylvania, where the candidate will be subject to the admission requirements of that institution. Only students admitted to Lock Haven University of Pennsylvania as first-semester (freshmen) students may participate in this 3-2 program. An individual who has been registered as a degree candidate and established a degree candidate record at The Pennsylvania State University prior to entering the 3-2 program at Lock Haven University of Pennsylvania will be considered a re-enrollment candidate and must meet the criteria for re-enrollment in the major at The Pennsylvania State University and not as a participant of the 3-2 program.

2. A student will indicate the desire to follow the 3-2 program either at the time of the student's admission to Lock Haven University of Pennsylvania, or early enough in the student's program to permit the student to complete as many of the suggested prerequisite courses, listed in the Appendix of this contract, as possible. Results from aptitude and achievement tests, records of scholastic achievement, and other pertinent information will be exchanged between institutions to aid both in guiding and in counseling students and prospective students. The Pennsylvania State University will provide Lock Haven University of Pennsylvania with copies of curriculum planning guides used by advisers at Penn State for each major.

Lock Haven University of Pennsylvania is responsible for informing students in the 3-2 program of the requirements for admission to Penn State, as described in this document and is encouraged to provide each student with a copy of this contract. Students should also be made aware of the courses that are available at Lock Haven University of Pennsylvania that can be used to meet degree requirements for each of the majors that are part of this agreement. To that end, students should be provided with a copy of the Appendix to this contract.

Students should be advised by Lock Haven University of Pennsylvania that some government-provided financial aid may not be available for a total of more than four years of study because engineering is considered, by financial-aid regulations, to be a four-year program. Students may, however, be eligible for merit-based scholarships after they complete one year of study at Penn State.
3. With the exception noted, the following engineering majors are generally available in the College of Engineering to students participating in the 3-2 program: Aerospace Engineering, Biological Engineering, Bioengineering\(^1\), Chemical Engineering\(^1\), Civil Engineering, Computer Engineering, Electrical Engineering, Engineering Science, Industrial Engineering, Mechanical Engineering, and Nuclear Engineering. However, the majors that are under enrollment control at the time of transfer to Penn State are excluded and are not available for transfer as part of this agreement. Lock Haven University of Pennsylvania will be given a 2-year notice of any major that will be coming under enrollment control and the exclusion of that major from the 3-2 program. The exclusion will apply to all students from Lock Haven University of Pennsylvania, even those who had been admitted to Lock Haven University of Pennsylvania before notification of the exclusion. Penn State will notify Lock Haven University of Pennsylvania whenever a major will cease to be under enrollment control and become available for transfer.

In the College of Earth and Mineral Sciences, the following engineering majors are available as part of this agreement: Energy Engineering, Environmental Systems Engineering, Materials Science and Engineering, Mining Engineering, and Petroleum and Natural Gas Engineering.

4. At the end of the first (Fall) semester of the third year, a student becomes a candidate for transfer for any of the available majors if the student has completed the entrance-to-major course requirements\(^2\) and has attained a cumulative grade point average of 3.00\(^3\) (on a 4.00 scale) or greater. In all cases, the cumulative grade point average that will be used to determine eligibility for an engineering major will be calculated by the method used at Penn State. Original grades plus the grades for the same courses that were repeated will be used in the calculation. Lock Haven University of Pennsylvania may require higher academic standards for transfer.

5. The student should submit an application (available on the Web) to the Admissions Office of The Pennsylvania State University after the Fall of the student's third year at Lock Haven University of Pennsylvania. The application should clearly indicate that the student is applying as a 3-2 student. It should be submitted promptly and no later than February 1 of the applicant's third year at Lock Haven University of Pennsylvania. The completed application should be supported by the following documents:

   a) Final high school record
   b) Two copies of the official Lock Haven University of Pennsylvania transcript, including all grades earned through the Fall Semester or Term of the third year
   c) Schedule of courses for the Spring of the third year
   d) Check sheet (see Appendix) of the courses taken and those planned for Spring Semester or Term of the third year, as they relate to the Penn State courses listed for the requested engineering major. Students must retain a copy of the check sheet for their own records.

The application and supporting documents will be evaluated by the appropriate officer in the Admissions Office and the respective Dean's Office of the College of Engineering or Earth and Mineral Sciences at The Pennsylvania State University. If the applicant meets the entrance requirements, the applicant will be offered provisional admission to The Pennsylvania State University in the 3-2 program, commencing with the following summer session or fall semester.

At the completion of the third year, two copies of the final official transcript of work taken at Lock Haven University of Pennsylvania should be forwarded to the Admissions Office. The applicant's admission to The Pennsylvania State University will be changed from a provisional basis to a permanent basis if the student has maintained the minimum cumulative grade point average required for transfer, is in good standing at Lock

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1 It is highly likely that more than two years will be required at PSU to complete the degree requirements for BIOE and CHE because major courses begin in the Spring Semester and are not offered every semester.

2 For College of Engineering majors, a minimum grade of 'C' is required in calculus I and II (8 credits), calculus-based physics (4 credits, mechanics plus lab), and general chemistry (3 credits).

3 Students may enter the majors in the College of Earth and Mineral Sciences (EMS) with a minimum cumulative grade point average of 2.75.
Haven University of Pennsylvania, and has fulfilled all conditions, if any, specified in the student's provisional admission. A minimum of 76 transferable and applicable credits must be completed at Lock Haven University of Pennsylvania. For the purpose of meeting Penn State degree requirements, a block of 76 credits (no more and no less) will be transferred to Penn State.

The student will be placed in the major in which provisional admission was offered, provided all entrance conditions are met. Under normal circumstances, failure to meet the conditions of provisional admission will result in the voiding of the offer of admission for the student and in his or her ineligibility to participate in the 3-2 program.

6. The suggested and available exposure to mathematics, science, engineering science, computer, liberal arts, and communications courses at Lock Haven University of Pennsylvania is illustrated in the Appendix. The only required courses are those listed in Section B-4. However, it is in the student's best interest to complete as many of the suggested courses for their intended engineering major as possible at Lock Haven University of Pennsylvania so that they can complete the degree requirements at Penn State in the most timely manner. Course numbers and descriptions may change by the actions of the Lock Haven University of Pennsylvania faculty or Penn State faculty. In such cases, the Appendix only would need to be amended. Lock Haven University of Pennsylvania will receive regular updates about changes at Penn State and will be expected to regularly inform Penn State of changes at Lock Haven University of Pennsylvania, as they relate to the 3-2 program. Students must bring a completed check-sheet (see Appendix) with them for their first meeting with their engineering faculty advisor.

The student's preparedness for engineering courses will be assessed by his/her major department and will be based on the courses taken at Lock Haven University of Pennsylvania, as described on the completed course check-sheet. If the student has not taken all the possible recommended courses at Lock Haven University of Pennsylvania, it is very likely that more than two years (4 semesters) will be required to complete the Penn State degree requirements. The need to take missing requirements and the effect this may have on the student's graduation date will be determined by the student's major department at Penn State.

7. This agreement shall be reviewed on a 5-year cycle. As part of the review process, special attention will be paid to the total number of students and to the number of women and members of other under-represented groups in engineering that participate in the program from Lock Haven University of Pennsylvania. A lack of response to requests for information and lack of adequate participation may result in termination of the agreement.

_Renata S. Engel_ 12/2/09  
Renata S. Engel  
Associate Dean for  
Academic Programs,  
College of Engineering

_Date_  
_Renata S. Engel_ 12/2/09  
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Associate Dean for  
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College of Engineering

_John R. Hellmann_ 11/23/09  
John R. Hellmann  
Associate Dean for  
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_Date_  
_Robert N. Pangborn_ 12/6/09  
Robert N. Pangborn  
Vice President and Dean for  
Undergraduate Education,  
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_James Wheeler_ 11/10/09  
James Wheeler  
Associate Professor of Physics,  
Lock Haven University of Pennsylvania

_Date_  
_Deborah B. Erickson_ 11/3/09  
Deborah B. Erickson  
Provost and Vice President for  
Academic Affairs,  
Lock Haven University of Pennsylvania
APPENDIX

Check sheets for core and major specific courses to be taken at
Lock Haven University of Pennsylvania
by students wishing to become eligible for the
3-2 Engineering Cooperative agreement with
The Pennsylvania State University

Available at:
http://www engr psu edu/ProspectiveStudents/Undergraduate/3-2instlist asp
# 3-2 Program Courses for Engineering Majors*

**The Pennsylvania State University**

<table>
<thead>
<tr>
<th>PSU Course</th>
<th>Credits</th>
<th>Course Title</th>
<th>PSU Majors</th>
<th>3-2 Course</th>
<th>Credits</th>
<th>Grade</th>
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<tr>
<td>BIOL 141, 142</td>
<td>3, 1</td>
<td>Physiology and Lab</td>
<td>BIO E, elective for E SC, I E, M E</td>
<td>No Equivalent</td>
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<td>CAS 100</td>
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<td>Effective Speech</td>
<td>ALL</td>
<td>SPCH 102 or 103</td>
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<td>CHEM 110</td>
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<td>Chemical Principles I</td>
<td>ALL</td>
<td>CHEM 120</td>
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<tr>
<td>CHEM 111</td>
<td>1</td>
<td>Experimental Chemistry I</td>
<td>ALL except AERSEP, M E</td>
<td>Part of CHEM 120</td>
<td>-----</td>
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<tr>
<td>CHEM 112</td>
<td>3</td>
<td>Chemical Principles II</td>
<td>BIOE, CH E, elective for E SC, I E, M E, ALL EMS except MNG E</td>
<td>CHEM 121</td>
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<tr>
<td>CHEM 113</td>
<td>1</td>
<td>Experimental Chemistry II</td>
<td>BIOE, CH E, MATSE</td>
<td>Part of CHEM 121</td>
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<tr>
<td>CHEM 210</td>
<td>3</td>
<td>Organic Chemistry I</td>
<td>BIOE, CH E, MATSE(PLMSE), ENENG</td>
<td>CHEM 220</td>
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<td></td>
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<tr>
<td>CHEM 212, 213</td>
<td>3, 2</td>
<td>Organic Chemistry II and Lab</td>
<td>BIOE, CH E, MATSE(PLMSE)</td>
<td>CHEM 221</td>
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<tr>
<td>CMPEN 270</td>
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<td>Introduction to Digital Systems &amp; Lab</td>
<td>CMPEN</td>
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<tr>
<td>CMPSC 121, 122</td>
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<td>Intermediate Programming</td>
<td>CMPEN</td>
<td>COMP 161</td>
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<td>CMPSC 200/201</td>
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<td>Computer Programming for Engineers</td>
<td>ALL except B E, CH E, CMPEN</td>
<td>COMP 160</td>
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<tr>
<td>E E 210</td>
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<td>Circuits and Devices</td>
<td>BIOE(EE option), CMPEN, E E, E SC</td>
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<td>E MCH 211</td>
<td>3</td>
<td>Statics</td>
<td>ALL except CH E, CMPEN, MATSE (PLMSE), and ENENG</td>
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<td>E MCH 212</td>
<td>3</td>
<td>Dynamics</td>
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<tr>
<td>E MCH 213</td>
<td>3</td>
<td>Strength of Materials</td>
<td>ALL except CH E, CMPEN, E E, ENVSE, MATSE (PLMSE) and ENENG</td>
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<tr>
<td>ECON 002 or 004</td>
<td>3</td>
<td>Intro. Microecon. or Macroecon. Analysis and Policy (GS)</td>
<td>ALL</td>
<td>ECON 101</td>
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<tr>
<td>EDSGN 100</td>
<td>3</td>
<td>Introduction to Engineering Design</td>
<td>ALL except CMPEN, ENVSE, MATSE, PNG E and ENENG</td>
<td>PHYS 105</td>
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<tr>
<td>ENGL 015</td>
<td>3</td>
<td>Rhetoric and Composition</td>
<td>ALL</td>
<td>ENGL 100</td>
<td>3</td>
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<tr>
<td>ENGL 202C</td>
<td>3</td>
<td>Effective Writing: Technical Writing</td>
<td>ALL</td>
<td>ENGL 360</td>
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<td>GEOSC 001</td>
<td>3</td>
<td>Physical Geology</td>
<td>C E, PNG E, ENVSE, MNG E</td>
<td>GEOS 110</td>
<td>3</td>
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### 3-2 Program Courses for Engineering Majors*

#### PSU Courses

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<tr>
<th>PSU Course</th>
<th>Credits</th>
<th>Course Title</th>
<th>PSU Majors</th>
<th>Institution Course</th>
<th>Credits</th>
<th>Grade</th>
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<tbody>
<tr>
<td>MATH 140</td>
<td>4</td>
<td>Calculus and Analytic Geometry I</td>
<td>ALL</td>
<td>MATH 141</td>
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<tr>
<td>MATH 141</td>
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<td>Calculus and Analytic Geometry II</td>
<td>ALL</td>
<td>MATH 142</td>
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<tr>
<td>MATH 220</td>
<td>2</td>
<td>Matrices</td>
<td>ALL except B E, CH E, PNG E, ENENG</td>
<td>MATH 211</td>
<td>3</td>
<td></td>
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<tr>
<td>MATH 230</td>
<td>4</td>
<td>Calculus and Vector Analysis</td>
<td>ALL except C E, ENVSE, MNG E</td>
<td>MATH 243, 244</td>
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<td>MATH 251</td>
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<td>Ordinary and Partial Differential Equations</td>
<td>ALL</td>
<td>MATH 301, PHYS 345</td>
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<tr>
<td>M E 201/300</td>
<td>3</td>
<td>Introduction to Thermal Science/Engineering Thermodynamics I</td>
<td>ALL except CH E, CMPEN, E E, E SC, MNG E and ENENG</td>
<td>No Equivalent</td>
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<td>PHYS 211</td>
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<td>General Physics (Mechanics)</td>
<td>ALL</td>
<td>PHYS 170</td>
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<td>PHYS 212</td>
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<td>General Physics (Electricity and Magnetism)</td>
<td>ALL</td>
<td>PHYS 171</td>
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<td>PHYS 213</td>
<td>2</td>
<td>Fluids &amp; Thermodynamics</td>
<td>AERSP, E E, E SC, PNG E, MNG E</td>
<td>PHYS 315</td>
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<td>PHYS 214</td>
<td>2</td>
<td>Waves &amp; Quantum Physics</td>
<td>ALL except B E, C E, I E, ENVSE, PNG E, MNG E, and ENENG</td>
<td>PHYS 314</td>
<td>3</td>
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<tr>
<td>STAT 401/418</td>
<td>3</td>
<td>Experimental Methods/Probability</td>
<td>C E, CMPEN, E E</td>
<td>MATH 312</td>
<td>4</td>
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#### General Education Electives

<table>
<thead>
<tr>
<th>Category</th>
<th>Course Title</th>
<th>Credits</th>
<th>PSU Majors</th>
<th>Institution Course</th>
<th>Credits</th>
<th>Grade</th>
</tr>
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<tbody>
<tr>
<td>Arts Electives (GA)</td>
<td>e.g. Architecture, Art History, Integrative Arts, Landscape Architecture, Music, Theatre Arts</td>
<td>6</td>
<td>ALL</td>
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<tr>
<td>Health (GHA)</td>
<td>Health Education and Exercise and Sport Activities</td>
<td>3</td>
<td>ALL</td>
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<tr>
<td>Humanities Electives (GH)</td>
<td>e.g. American Studies, Classics, History, Humanities, Multi-Ethnic Studies, Philosophy, Religious Studies</td>
<td>6</td>
<td>ALL</td>
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<tr>
<td>Social &amp; Behavioral Science Elective (GS)</td>
<td>e.g. Anthropology, Human Development, Political Science, Psychology, Sociology</td>
<td>3</td>
<td>PENG, MNG E, and ENENG require an ethics elective</td>
<td>MATH 312</td>
<td>4</td>
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</tbody>
</table>

*College of Engineering (EN) Majors:

- AERSP: Aerospace Engineering
- B E: Biological Engineering
- BIOE: Bioengineering
- CH E: Chemical Engineering
- C E: Civil Engineering
- CMPEN: Computer Engineering
- E: Electrical Engineering
- E SC: Engineering Science
- I E: Industrial Engineering
- M E: Mechanical Engineering
- NUC E: Nuclear Engineering

*College of Earth and Mineral Sciences (EMS) Majors:

- ENENG: Energy Engineering
- ENVSE: Environmental Systems Engineering
- MATSE: Material Science and Engineering
- PLMSE: Polymer Science and Engineering
- MNG E: Mining Engineering
- PNG E: Petroleum and Natural Gas Engineering

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