

# BE Planning Guide

DARTMOUTH CLASS OF 2011 AND BEYOND AND DUAL-DEGREE CANDIDATES ENTERING 09/10 AY

(This is for planning purposes only – You will need to go to [Banner Student](#) to complete the Bachelor of Engineering program plan)

See below for BE REQUIREMENTS

At least 6 courses must include Significant Engineering Design Content (See INSTRUCTIONS)		Term & Year (e.g., 08F)	Math & Natural Science	Engineering Science & Design	Significant Design Content
One of ENGS 91, 92 or 103 is required and may be counted either as a mathematics elective or as an engineering sciences elective.					
<b>A. MATHEMATICS AND NATURAL SCIENCE</b>					
1. Math 3			1	–	–
2. Math 8			1	–	–
3. Math 13			1	–	–
4. Phys 13			1	–	–
5. Phys 14			1	–	–
6. Chem 5			1	–	–
7.	See INSTRUCTIONS for allowable elective courses in Mathematics & Natural Science		1	–	–
8.			1	–	–
9.			1	–	–
<b>B. ENGINEERING CORE</b>					
1. ENGS 20 (or CoSci 5)			–	0.5	–
2. ENGS 21			–	1	√
3. ENGS 22			–	1	–
4. ENGS 23			–	1	–
<b>C. ENGINEERING DISTRIBUTIVE CORE</b>					
5. ENGS	Select 2 from ENGS 24, 25, 26, 27		–	1	
6. ENGS			–	1	–
<b>D. ENGINEERING GATEWAY COURSES</b>					
7. ENGS	Select 2 from 2 different disciplines (ENGS 31 or 32, 33 or 34, 35 or 36, 37)		–	1	
8. ENGS			–	1	
<b>E. ENGINEERING ELECTIVES</b>					
9.	Up to 2 of these 3 electives may be courses in Mathematics and Natural Science (See INSTRUCTIONS)				
10.					
11.			–	1	
12.	Three course engineering concentration, one with significant design content		–	1	
13.			–	1	
14.			–	1	
<b>F. CAPSTONE ENGINEERING DESIGN</b>					
15. ENGS 89 (previously 190)			–	1	√
16. ENGS 90 (previously 290)			–	1	√
<b>C. TOTALS (25 COURSES MINIMUM REQUIRED FOR THE BE)</b>			<b>Math/Sci</b>	<b>Engineering</b>	<b>Design</b>
Minimum courses required for ABET			9	13.5	6
Thayer requirements for the B.E.: MATH/NAT'L SCI + ENGS ≥ 24.5					

## INSTRUCTIONS

- 1. ADMISSIONS** Apply for admission and financial aid (if needed) to the Thayer School Academic & Student Affairs Office (Room M103). For students enrolled in the engineering sciences major or dual-degree program, completion of the A.B. major with a GPA of 2.0 or higher in the major guarantees admission to the Thayer School B.E. program. However, one must still file a Student Information Form, a Program Form, and a Financial Aid application (if needed) with the Academic & Student Affairs Office.  
**ENGS 21 is a prerequisite for admission to the B.E. program. It must be taken prior to enrollment in ENGS 89/90 (previously 190/290).**
- 2. UNDERGRADUATE PROGRAM** Indicate in the appropriate space if you completed the Dartmouth engineering sciences major, engineering physics major, modified major (give the modifying subject), or dual degree program (give your college and major).
- 3. DEGREE REQUIREMENTS: OVERALL**  
The courses listed on this form in satisfaction of degree requirements must meet the following minimum ABET\* requirements:
  - One year of mathematics and natural science, which is 9 courses (or course equivalents).
  - 1.5 years of engineering science or engineering design, which is 13.5 courses (or course equivalents).
  - A significant component of engineering design, which is interpreted to be six courses with significant design content
  - One-half year of humanities and social sciences, which is covered by the Dartmouth A.B. program.For the B.E. degree, Thayer School requires 2 additional courses beyond these minimum ABET\* requirements bringing the total number of required math and engineering, computer and natural sciences courses to 25. Of the 25, one full course (ENGS 20/COSC 5) is allowed 0.5 engineering credits, hence the 24.5 appears elsewhere on the form.
- 4. MATHEMATICS AND NATURAL SCIENCE (SECTION A)** The following courses in mathematics and natural science are required: Three courses in calculus, through multivariable (MATH 3, 8, 13); two courses in physics (PHYS 13, 14); one course in general chemistry (CHEM 5). One of the applied mathematics courses ENGS 91, 92, or 103. Two more non-introductory courses, from the following list: ASTR 15 and above; BIOL 11 and above; CHEM 6 or 10, 41 and above; COSC 19, 25, 39; EARS 26 and above; ENVS 20, 79, and 89; MATH 16 and above; PHYS 17, 19 or 23, 24, 41 and above; ENGS 91, 92, 100, 103, 104, 105, 106.
- 5. ENGINEERING CORE AND GATEWAY COURSES (SECTIONS B, C, D)** The following engineering sciences courses are required for all B.E. candidates regardless of undergraduate major: One course in computer science (ENGS 20 or COSC 5), counted as 0.5 ENGS ; ENGS 21, 22 and 23; two courses selected from ENGS 24, 25, 26 and 27; two courses selected from two of four different disciplinary areas including ENGS 31 or 32; ENGS 33 or 34; ENGS 35 or 36; and ENGS 37. Students holding either a bachelor's degree in natural science or the Dartmouth AB in engineering modified with natural science may satisfy the distribution requirement for the gateway courses by electing two courses from the same disciplinary area.
- 6. ENGINEERING ELECTIVES (SECTION E)** At least three of the 6 elective courses must form a coherent disciplinary concentration in engineering, e.g., EE, ME, etc. One of these three must carry design credit. The remaining 3 electives may be chosen from
  - ENGS or ENGG courses numbered 24-88, 110-175. Only one of ENGS 86 or 88, and one term of ENGS 87, may be included.
  - ENGS 75 & 175 carry engineering design credit but not engineering sciences credit.
  - Engineering management (ENGM) courses are excluded from the B.E. program.
  - The applied math courses ENGS 91, 92, 100, 103, 104, 105, 106 may be counted as engineering sciences or as mathematics.
  - Outside Thayer School: COSC 23-78 (except 32, 42) and 104-188 (except 110); EARS 66
  - Two of these 3 electives may include courses in mathematics and natural science as listed in Section 4 above.
- 7. CAPSTONE DESIGN PROJECT (SECTION F)** The two-course capstone engineering design experience, ENGS 89/90 (previously 190/290), is required. **At least six engineering prerequisites are required, including ENGS 21 plus five courses selected from ENGS 22-76.**
- 8. SIGNIFICANT DESIGN CONTENT (LAST COLUMN)** In addition to ENGS 21, 89/90, at least three additional courses in your program must include significant design content: These courses include: ENGS/ENGG 26, 31, 32, 33, 36, 37, 44, 51, 61, 62, 63, 65, 71, 73, 75, 76, 124, 125, 126, 127, 128, 129, 130, 135, 145, 146, 157, 158, 165, 171, 175, 240, and COSC 23. ENGS 86-88 may be approved for design credit by the B.E. program committee, based on evaluation of the work done.
- 9. FILLING IN THE COLUMNS, TOTALS**
  - Fill in the term and year when each course was taken (e.g., 08F for fall term, 2008).
  - For two of the elective courses in Section E, place a 1 in the appropriate column to indicate credit for mathematics and natural science or engineering sciences.
  - Place a check in the design column for each course that has significant design content.
  - At the bottom of the form, add up the credits in the math/natural science, engineering sciences, and design columns. To be eligible for the B.E. degree, this total must include at least 25 courses with 9 courses minimum in math/natural science, 13.5 courses minimum in engineering sciences, and 6 courses minimum containing engineering design.
- 10. APPROVAL** This form must be completed, signed by your advisor, and returned to the Thayer School Academic & Student Affairs Office, along with your Student Information and Financial Aid forms, at least three terms prior to the expected completion of your

B.E. program. The program must be approved by the B.E. Program Committee. Revised program forms should be submitted to the Thayer School Registrar and must be approved by your advisor and the B.E. Program Committee.

11. **GRADE POINT AVERAGE FOR GRADUATION** For the award of the B.E. degree, a GPA of 2.33 or higher is required in all post-prerequisite courses taken at Dartmouth to satisfy the requirements.

\*ABET= the Engineering Accreditation Commission of ABET(Accreditation Board of Engineering and Technology), 111 Market Place, Suite 1050, Baltimore, MD 21202-4012-telephone (410) 347-7700