PhD Innovation Programs

Prof. Eric Fossum, Director

Thayer PhD Innovation Program
Guarini PhD Innovation Program
Early arc of technology innovation

Dartmouth PhD Innovation Program

- *inspire* students to be leaders, *nurture* latent interests and abilities, and *prepare* them for opportunity

- Three (3) years of fellowship funding
- Up to $10K per year research funds
- Additional coursework and experiential learning in innovation and entrepreneurship
PhD Innovation Program

• Regular research PhD program plus entrepreneurial training
• Thayer PhD Innovation Program launched by Helble, Collier, Hutchinson in 2008. Fossum joins Dartmouth as Director in 2010.
• Expanded to Guarini PhD Innovation Program in 2019 by Jon Kull.
• Innovation Program Fellows supported by school funds starting in year 2 of PhD program for up to 3 years FTE. Includes up to $10K/yr for research expenses for up to 3 years.

National Academy of Engineering
2014 Gordon Prize
“For creating an integrated program in engineering innovation from undergraduate through doctorate to prepare students for engineering leadership”
## Curriculum and Funding Comparison (Thayer Program)

### COURSE REQUIREMENTS

<table>
<thead>
<tr>
<th>Regular PhD Program</th>
<th>PhD Innovation Program</th>
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<tbody>
<tr>
<td><strong>Regular Courses</strong> (8-10 total, 6 first year)</td>
<td><strong>PhD Innovation Program</strong> (updated Nov 10, 2019)</td>
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<tr>
<td>(1) Graduate technical course</td>
<td>Technical Depth</td>
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<tr>
<td>(2) Graduate technical course</td>
<td>Technical Depth</td>
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<td>(3) Graduate technical course</td>
<td>Technical Depth</td>
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<tr>
<td>(4) Graduate technical course</td>
<td>Technical Depth</td>
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<tr>
<td>(5) Applied math Elective</td>
<td>Math Proficiency</td>
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<tr>
<td>(6) Applied math Elective</td>
<td>Math Proficiency</td>
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<tr>
<td>(7) Graduate technical course</td>
<td>Engineering Science Breadth</td>
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<tr>
<td>(8) Graduate technical course</td>
<td>Engineering Science Breadth</td>
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<tr>
<td>(9) Graduate technical course (depends on advisor)</td>
<td>ENGM 187 Tech. Innov. and E-ship Innovation</td>
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<tr>
<td>(10) Graduate technical course (depends on advisor)</td>
<td>ENGM 180 Corporate Finance</td>
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<td>ENGM 188 Law for Technology and Entrepreneurship</td>
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<td>ENGG 321 Adv. Innovation and Entrepreneurship</td>
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<td></td>
<td>ENGG 300 Internship (Typ. 3-6 months) summer after yr 3</td>
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<td>TPSI only Surgical Innovation Rotation and Training</td>
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### Yearly Funding

- **Regular PhD:**
  - Thayer Fellowship
  - Advisor’s project and funding

- **IP Fellows:**
  - Year 1: 50% IP Fellowship
  - Year 2: 2 cross-over years
  - Year 3 and beyond: 100% IP Fellowship up to 2 years
  - Up to $10K/yr for research starting year 3
Dartmouth Applied Learning and Innovation (DALI) Lab

- Design and develop for mobile, web, VR/AR, games, interactive media, data viz, product design, and much more
- Experiential Learning and Professional Development
- Paid extra-curricular internship opportunity
- Work in teams of designers, coders, engineers, and a project manager
Stats thus far (Thayer)

DARTMOUTH

• Maximum 5-7 students admitted each year. Tend to be highly qualified PhD students.
  • 15% of PhD program

• Admitted students come from outside Dartmouth and inside Thayer regular PhD program (about 50/50).

• As of November 2019, 25 graduates
  • 8 women (32%), 7 foreign
  • 10 founded startups, 14 total involved w/ startups

• Currently 26 students in program
  • 11 women (42%), 6 foreign
  • 2 active startups

• Active engagement with Tuck E-ship programs/students

• Relationship with DEN/Magnuson (incl. I-Corps) growing stronger
PhD Innovation Program
student startups

BBR Medical

Clairways
(top prize winner Magnuson Center startup competition $52,500)

SustainX
SMARTER ENERGY STORAGE

Neutrolectric
(top prize winner international startup competition Abu Dhabi $50,000)

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WHERE EVERY PHOTON COUNTS
PhD Innovation Program
Internships (incl. student startups)

- Amazon
- Microsoft
- Intel
- Apple
- Analog Devices
- Applied Materials
- Sproxil
- Mobile Med International
- SustainX
- Domain Surgical
- Transient Electronics
- BBR Medical
- Invenshure
- Questek
- Ameliomed
- Creare
- RSG
- Gigajot
- Avitide
Some Current Innovation Program Fellows