

## ME 537: Product Realization

**Instructor Name:** Anna Thornton  
**Office Location:** 202D, 730 Comm. Ave.  
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**Office Hours:** TBD

**Course Dates:** Spring XXX  
**Course Time** TBD  
**Course Credits:** 4  
**Course Location:** TBD

### Course Description.

This course focuses on the essential and challenging process of getting a design from the drawing board into a customer's hands. Cases are drawn from a range of industries, technologies, and development speeds (everything from hardware startups to aircraft). It includes topics such as Design for Manufacturing, validation testing, cash flow modeling, in- vs. outsourcing, setting up a factory, selecting supplier partners, distribution, and ongoing product support. There will be a semester-long project where students will build one prototype, one EVT unit, two DVT units, and 10 PVT units. In addition, the students will create all of the design and production documentation required to launch a product.

### Instructional Format, Course Pedagogy, and Approach to Learning

The course will be taught as a mix of lectures, hands-on demos, cases, in-class work, and presentations. The teams will practice the course material through a semester-long project.

- Teach the framework and processes to bring a product to the market. The framework will cover processes for both small startups as well as established large companies
- Help students appreciate the complexity and multi-disciplinary nature of product realization.
- Teach students how to ask the right questions, identify risk and find the resources to launch products
- Enable students to be better prepared for joining an industry product team, whether for a startup, small or large organization.
- Provide resources and frameworks for the students to continually learn after the course is over.
- Help students appreciate how early design decisions can have dramatic and unexpected consequences in production and help them incorporate those learnings into the upfront design.

### Books and Other Course Materials

- *Product Realization* by Anna C Thornton
- Additional readings will be posted on Blackboard

### Courseware

We will use several online systems to facilitate course material distributions, assignments, and exams. You can find all of the information on how to get access to these programs on Blackboard.

- Blackboard will be used to distribute all of the course material.
- Gradescope will be used for all exams and assignments.
- Some materials will be distributed and collected through google docs. The links will appear in Blackboard
- Slack will be used to share information with the class and for peer-to-peer communications.

## Assignments and Grading

1. The project will be done through seven (7) assignments.
2. Grading
  - 70% assignments
  - 10% class contribution
  - 20% team evaluation

## Resources/Support/How to Succeed in This Course:

- Prof. Thornton will be available for normal office hours, and individual meetings can be set up as needed.
- Participation in both class and within your team is critical.
- Please come prepared to class, having read the readings, and watched any videos.
- Accommodations for Students with Documented Disabilities: If you are a student with a disability or believe you might have a disability that requires accommodations, please contact the Office for Disability Services (ODS) at (617) 353-3658 to coordinate any reasonable accommodation requests. ODS is located at 19 Deerfield Street on the second floor.

## Community of Learning: Class and University Policies

- **Attendance & Absences.** Attendance & Absences. Please notify Prof. Thornton if you need to be absent. Absences for university-approved reasons will be allowed, and we will work to plan how to make up the work. The lectures and labs will be posted on Blackboard. You will be allowed one unexcused absence.
- **Assignment Completion & Late Work.** Late assignments without permission will not be graded.
- **Academic Conduct Statement.** All students will be expected to follow BU's academic conduct code (<https://www.bu.edu/academics/policies/academic-conduct-code/>). The project will require work in EPIC and other maker spaces around BU. It is expected that students will operate all equipment safely.

## Visitors include

- Erbi Biomedical
- Formlabs
- Splat
- Embr Labs
- Hydro
- Apriori

Lecture	Assignment	Lecture Topics	Reading*	Demo / Guest lecture / Team time
1		Introduction		3-D printing
2	A1: 3 Ideas	Manufacturing processes	Chapter 1: Intro	PRESENTATIONS
3		Pilot process	Chapter 2: Are you ready to start & Chapter 3: Product realization	Visitor
4		Project management	Chapter 4: Project management	Wood laminate/fiberglass
5		Spec document	Chapter 5: Specifications	Laser cutting
6	A2: Proposal	Product definition	Chapter 6: Product definition	PRESENTATIONS
7		Quality testing	Chapter 7 quality testing	Thermoforming
8		Quality testing		Review time
9		Costing	Chapter 8: costs	Metal bending
10		Manufacturing systems	Chapter 9: manufacturing systems	Review time
11	A3: Concept	DFM	Chapter 10 DFM	PRESENTATIONS
12		Process design	Chapter 11: Process design	aPriori
13		Tolerance analysis/metrology		Metrology
14		Tooling	Chapter 12: tooling	Visitor
15	A4: EVT	Presentation		Presentations
16		Production planning	Chapter 13 Production quality	Surface finish
17		Suppliers	Chapter 14: Supply chain	Welding
18		Packaging		Visitor
19	A5: DVT	Production planning	Chapter 15: Production planning	Presentations
20		Distribution	Chapter 16: Distribution	Visitor
21		Team time		Review time
22		Certs	Chapter 17: Certs and labeling	Visitor
23		Customer support	Chapter 18: Customer support	Review Time
24	A6: PVT	Mass production	Chapter 19: Mass production	Presentations
25		Team time		Review time
26	A7: MP	Final presentation		Celebration and project review

**\*Additional readings may be posted on Blackboard.**