



BENG 499/590: Biotechnology Commercialization
Cross-listed with MGMT 491
Spring 2018

Instructor (School of Engineering):

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Co-instructor (INOVA):

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Co-instructor (School of Business):

Dr. Derek M Horstmeyer

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Lectures: Tuesday: 1:30pm-4:10pm, location EXPL L003

Important Notes and Dates:

- **Final Exam:** May 15th, 2018
- **Holidays:** March 12th – 18th, 2018 (Spring Break)

Course Description:

This course will train students to become professionals by understanding science and developing skills in the complexities of biotechnology commercialization. This new course brings together a strong science foundation with biotechnology enterprise and entrepreneurship, providing a unique educational venue for bioengineering and business students to better understand the entire biotechnology commercialization and issues unique to the industry.

Prerequisites: TBD

Requirement or Elective:

- This course is a technical elective for bioengineering students
- MGMT students receive major credit, all other School of Business students receive general elective credit

Course Objectives:

- Students will understand the interdisciplinary nature of the biotechnology industry in the areas of science, regulation and enterprise.
- Students will be able to describe the various steps in the development of a biotechnology derived product: from its inception as intellectual property, to scale-up, to the final product.
- Students will explore financial, funding, and marketing strategies for success
- Student will identify, evaluate and assess risks and payoffs in monetary and non-monetary terms

Course Topics:

Classroom and practical experiences will be delivered via lectures and case studies that focus on the steps to Biotechnology Commercialization. See course outline for details.

Teams and Projects:

- Students will be divided into teams of 4-5 to be continued through the entirety of the course.
- Each group will choose a project (e.g. start-up company scenario) at the beginning of the semester.
- Each group and members will be responsible for the case study write-ups, mid-semester deliverables and final presentation.

Assignments:

Case Studies: There will be two case study assignments. A typical case study example is moving from ideas to prototypes, to products – describing the chronology of a product from inception to commercialization. Students will be asked for pointed analysis on opportunities and pitfalls. Another example of case study includes market analysis and business plan. This case will include the description of a product-stage company, and students will ask to critique the market strategy and business plan based upon qualitative and quantitative data.

Midterm: There will be one midterm assignment with specific deliverables.

Final Presentation: There will be one final presentation in lieu of a final exam. Team will put together an Investment Pitch using all principles derived in the course on their start-up company scenario project. They will need to answer criticism/questions from a panel of evaluators.

Policies:

Students will NOT be allowed to make up assignments or examinations.

All formal assignments are to be treated as individual and not collective efforts, unless specified otherwise. A severe penalty will be given to any assignment which indicates collusion or cheating. The usual penalty for cheating is failure in the course.

Every assignment must be completed, working, and turned in. For each assignment that is not, the final grade in the course will be lowered.

All assignments will be submitted in class on the day in which they are due. Any assignments turned in after the submission deadline will receive a zero.

Grading Structure:

- The final grade will be based on (Tentative, subject to change):

	BENG 499/ MGMT 491	BENG 590
Participation (Class attendance and case study contribution)	10%	10%
Case Studies	30%	30%
Mid-semester Assignment	30%	20%
Final Presentation	30%	20%
3D Drawing and/or Prototype	N/A	20%

- The grading scale for this course is:

97-100%	A +
93-97%	A
90-93%	A -
87-90%	B +
83-87%	B
80-83%	B -

77-80%	C +
73-77%	C
70-73%	C - *
60-70%	D *
0-60%	Failing *

* Bioengineering UG students only: Grades of "C-" and "D" in this course are considered unsatisfactory. According to departmental policy, no C- or D in ECE, BENG, BIOL, CS or ENGR courses can be submitted for the degree in Bioengineering. You will need to repeat the course if you obtain a grade of C- or lower.

Class Attendance:

100 points	80 points	60 points	40 points	20 points
Never misses classes	Rarely misses classes	Sometimes misses classes	Absent for most classes	Rarely attends classes

Attendance to all lectures is encouraged to all students. Attendance to all case studies and presentations is mandatory to all students. Failure to attend case studies and presentations will result in failure in the course.

GMU Policies and Resources for Students:

- Students must adhere to the guidelines of the George Mason University Honor Code [See <http://academicintegrity.gmu.edu/honorcode/>].
- Students must follow the university policy for Responsible Use of Computing [See <http://universitypolicy.gmu.edu/all-policies/>].
- Students are responsible for the content of university communications sent to their George Mason University email account and are required to activate their account and check it regularly. All communication from the university, college, school, and program will be sent to students solely through their Mason email account.
- The George Mason University Counseling and Psychological Services (CAPS) staff consists of professional counseling and clinical psychologists, social workers, and counselors who offer a wide range of services (e.g., individual and group counseling, workshops and outreach programs) to enhance students' personal experience and academic performance [See <http://caps.gmu.edu/>].
- Students with disabilities who seek accommodations in a course must be registered with the George Mason University Office of Disability Services (ODS) and inform their instructor, in writing, at the beginning of the semester [See <http://ods.gmu.edu/>].
- Students must follow the university policy stating that all sound emitting devices shall be turned off during class unless otherwise authorized by the instructor. The George Mason University Writing Center staff provides a variety of resources and services (e.g., tutoring, workshops, writing guides, handbooks) intended to support students as they work to construct and share knowledge through writing [See <http://writingcenter.gmu.edu/>].

Professional Dispositions:

- Students are expected to exhibit professional behaviors and dispositions at all times.

Core Values Commitment:

- The College of Education & Human Development is committed to collaboration, ethical leadership, innovation, research--based practice, and social justice. Students are expected to adhere to these principles. [See <http://cehd.gmu.edu/values/>].

WAVES: Wellness, Alcohol and Violence Education and Services:

WAVES promotes wellness within the Mason community through health education, alcohol/drug assessment and education, and violence awareness, prevention and sexual assault response. We help students make healthy, safe choices and encourage lifelong, thoughtful healthy decision-making through individualized support, creative programming, and evidence-based education and outreach.

WAVES office 703-993-9999

SUB I, Suite 3200

24-Hour Sexual and Intimate Partner Violence Crisis Line 703-380-1434

waves.gmu.edu

- 703-360-7273 (Fairfax County Office for Women and Domestic and Sexual Violence Services 25 hotline)
- 703- 228-4848 (Arlington County Domestic Violence Services Hotline)

- 703-368-4141 (Prince William County Sexual Assault Victims Advocacy Services (SAVAS) hotline)
- 1-800-838-8238 (Virginia Family Violence and Sexual Assault Hotline)
- 1-800-656-HOPE (Rape, Abuse and Incest National Network)
<https://ohl.rainn.org/online/>

CAPS: Counseling and Psychological Services:

Counseling and Psychological Services (CAPS) provides a wide range of free *confidential* services to students, faculty, and staff. Services are provided by a staff of professional clinical psychologists, social workers, counselors, learning specialists, and psychiatric providers. CAPS individual and group counseling, workshops, and outreach programs are designed to enhance students' personal experience and academic performance.

Visit us at **caps.gmu.edu** for additional resources.

- For consultation or emergency assistance during office hours call 703-993-2380.
- For assistance during non-office hours, call University Police at 703-993-4357.
- 703-527-4077 (CrisisLink)
- 1-800-273-8255 (National Suicide Prevention Lifeline)
- 1-877-838-2838 (Veterans' Crisis Hotline)

Student Health Services (SHS) — Provides *confidential* health care to enrolled students in emergency and non-emergency circumstances on the Fairfax, Arlington and Prince William campuses. If there is a medical emergency and Student Health Services (SHS) is closed, please contact the free after-hours nurse ((703) 993-2831), a hospital emergency room, an urgent care facility, or call 911.

**SUB 1, Suite 2300
703-993-2831**

University Police:

Emergency: 911

Non-Emergency: (703) 993-2810

Reporting a Crime (Crime Solvers Anonymous Tip Hot-Line): (703) 993-4111

Mason Police Website: <http://police.gmu.edu/>

Eric Heath, Chief of Police

Phone: (703) 993-3840

E-mail: eh2@gmu.edu