General course information

BIEN175A - 001 SENIOR DESIGN

WAITLIST

Call Number :	10735		Instructor : Park B	Units : 2.00	Max Enrollment : 78
Class Activities :	LEC W 09:10 a.m. - 10:00 a.m.	INTN 1002	CHASS Interdisciplinary Bldg-North (INTN) view		Available Seats : 0
	PRC M 03:10 p.m. - 06:00 p.m.	TBA TBA	To Be Announced (TBA) view		Wait List Max : 5
Co-requisites :	n/a				# on Wait List : 0
Prerequisites :	BIEN130L with a grade of "D-" or better				
Restrictions :	This course has no restrictions at the course wide level				
Cross-Listed with :	n/a				
Grade Type :	n/a				
Final Exam Date :	12/11/2015				
Final Exam Time :	08:00A.M. - 11:00A.M.				
Schedule Note(s) :	Course Material Fee required.				

Catalog Description : BIEN 175A Senior Design, 2 units, Lecture, 1 hour; practicum, 3 hours. Prerequisite(s): BIEN 130L. Covers the entire design process for bioengineering. Explores intellectual property, quality control, and regulatory and ethical considerations. Requires working in small teams effectively to prepare formal engineering reports, web pages notebooks, oral presentations, a project demonstration, and a business plan. Graded In Progress (IP) until BIEN 175A, BIEN 175B, and BIEN 175C are completed, at which time a final letter grade is assigned.

- Instructor
  - B. Hyle Park
  - MSE 243 / Bourns B232
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  - Christina Birch
  - Bourns A127
  - birch@mit.edu (change to ucr.edu later)

- Teaching assistants
  - Christian M. Oh
  - Bourns B232
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  - Chris Hale
  - Bourns A135
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Course objectives

"BIEN 175A Senior Design, 2 units, Lecture, 1 hour; practicum, 3 hours. Prerequisite(s): BIEN 130L. Covers the entire design process for bioengineering. Explores intellectual property, quality control, and regulatory and ethical considerations. Requires working in small teams effectively to prepare formal engineering reports, web pages notebooks, oral presentations, a project demonstration, and a business plan. Graded In Progress (IP) until BIEN 175A, BIEN 175B, and BIEN 175C are completed, at which time a final letter grade is assigned."

1. Work in small (4-5) groups to develop working prototypes of bioengineering design projects
2. Effective written and verbal communication
3. Competition!
4. Learn topics not covered in other portions of undergraduate curriculum
   - Business / entrepreneurship
   - Intellectual property
   - Ethical considerations
   - Quality control
   - Regulatory affairs

BMEStart

bmestart is the first competition in the u.s. designed specifically for undergraduate biomedical and bioengineering students

- The world needs more effective, functional and affordable technology solutions to clinical medical problems. Our BMEStart competition recognizes undergraduate excellence in biomedical innovation. We challenge undergraduates to pioneer a health-related technology that addresses a real clinical need. Competition entries are judged on:
  - Technical, economic and regulatory feasibility
  - Contribution to human health and quality of life
  - Technological innovation
  - Potential for commercialization

bmestart competition deadline:

- May 2016
- Winners announced in September at 2016 BMES Annual Meeting

NIH DEBUT (last year's competition)

- DEBUT is NIBIB's challenge to teams of undergraduate students to design solutions to unmet clinical needs.
  - 1st Prize: $20,000
  - 2nd Prize: $15,000
  - 3rd Prize: $10,000
  - 6 Honorable Mentions
- Winning teams will be honored at an award ceremony during the Annual Meeting of the Biomedical Engineering Society.
- Submission Period: March 16, 2015 to June 1, 2015, 11:59 PM EDT
- Judging Period: June 10, 2015 to July 31, 2015
- Winners announced: August 21, 2015
- Award ceremony: October 9, 2015, Biomedical Engineering Society Conference, Tampa, Florida

LIMBS

LIMBS International will host a Design Competition at the 4th Annual LIMBS Summit in cooperation with The University of Texas at El Paso-College of Engineering on Friday, June 3, 2016. The Summit provides a platform where research students from around the world can gather to share the progress they have made over the past year toward developing low-cost prosthetic devices of various kinds. The summit is a one of a kind an opportunity to learn, collaborate and discover opportunities for ongoing research and development of Prosthetic & Orthotic devices for the world's neediest people with disabilities.

Competition Details

Projects for the Design Competition shall be low-cost Prosthetic or Orthotic technologies for developing countries. These projects must be developed by a student or team of students in a BS or MS program during the 2015-2016 academic year. At least one student from the design team must attend the Summit on the campus of UTEP on June 3, 2016 and present the project at the event. Project submissions are subject to approval.

Register your team by October 1, 2015 to enter a design in the competition

To register, send the following information:

1. School Name
2. Project Contact Name
3. Project Contact Email
4. Brief Project Description

Additional Information:

All teams must address the limitations and needs of low income patients around the world and produce a prototype that meets the technological, economic and social requirements of patients in developing nations. Designs will be judged by attending students and professors with cash prizes awarded to the winners.

Competition Judging:

Judging will be based on innovation of the design and adherence to the design criteria including the robustness and completeness of the final report. Teams are strongly urged to consider the judging criteria while develop their abstract and presentation.

Deliverables and grading

Major (group)

- BIEN175A (Fall)
  - Team/project proposal (functional blocks)
  - Elevator pitch competition
- BIEN175B (Winter)
  - Written business plan
  - Business plan competition
- BIEN175C (Spring)
  - Final competition (demonstration)
  - Final written report

Minor (group)

- Web page
- Notebook

Major (individual)

- Written progress reports
- In-person interviews
- Faculty assessment (can include quizzes)

Minor (individual)

- Peer assessment

Schedule

	Monday			Tuesday			Wednesday			Thursday			Friday		
0										9/24			9/25		
1	9/28	3:10-5pm	CHUNG205	9/29			9/30	9:10-10am	INTN1002	10/1			10/2		
	PRC01		Park				LEC01		Park						
	Overview, team formation						Identifying a project goal								
2	10/5	3:10-5pm	CHUNG205	10/6			10/7	9:10-10am	INTN1002	10/8			10/9		
	PRC02		TA				LEC02		Guest						
	Solidworks, 3D printer						Identifying a project goal								
3	10/12	3:10-5pm	CHUNG205	10/13			10/14	9:10-10am	INTN1002	10/15			10/16		
	PRC03		TA				LEC03		TA						
	Basic Arduino programming						Basic Arduino programming								
4	10/19	3:10-5pm	CHUNG205	10/20			10/21	9:10-10am	INTN1002	10/22			10/23		
	PRC04		TA				LEC04		TA						
	Biological sensors						Biological sensors								
5	10/26	3:10-5pm	CHUNG205	10/27			10/28	9:10-10am	INTN1002	10/29			10/30		
	PRC05		TA				LEC05		TA						
	Data analysis with Matlab						Data analysis with Matlab								
6	11/2	3:10-6pm	MSE243	11/3			11/4	9:10-10am	INTN1002	11/5			11/6		
	PRC06		Park				LEC06		Park						
	Project vetting						Bioengineering ethics								

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	Monday			Tuesday			Wednesday			Thursday			Friday		
5	10/26	3:10-5pm	CHUNG205	10/27			10/28	9:10-10am	INTN1002	10/29			10/30		
	PRC05		TA				LEC05		TA						
	Data analysis with Matlab						Data analysis with Matlab								
6	11/2	3:10-6pm	MSE243	11/3			11/4	9:10-10am	INTN1002	11/5			11/6		
	PRC06		Park				LEC06		Park						
	Project vetting						Bioengineering ethics								
7	11/9	3:10-6pm	MSE243	11/10			11/11	9:10-10am	INTN1002	11/12			11/13		
	PRC07		Park				LEC07		Park						
	Project vetting						Intellectual property								
8	11/16			11/17			11/18	9:10-10am	INTN1002	11/19			11/20		
							LEC08		Park						
							Business/entrepreneurship								
9	11/23			11/24			11/25	9:10-10am	INTN1002	11/26			11/27		
							LEC09		Park/Jasso						
							Elevator pitch competition								
10	11/30			12/1			12/2	9:10-10am	INTN1002	12/3			12/4		
							LEC10		Jasso						
							Business fundamentals 01								
Finals	12/7			12/8			12/9			12/10			12/11		

Project parameters

- Group formation
  - 4-5 BIEN students enrolled in BIEN175A
  - 1-2 SoBA consultants (assigned at end of BIEN175A)
  - 1 BIEN faculty advisor
    - Limit of 2 projects for Assistant Professors

- Project objective(s)
  - Must be an original design project, not a research project

- Project budget
  - $1000 per group
  - Total budget for all 3 quarters

Software installation

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    Comsol, t
- Installation ins
  - http://syst
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