



Mechanical Engineering

“Scientists discover the world that exists;
engineers create the world that never was.”

Theodore von Karman

"Engineering is a great profession. There is the fascination of watching a figment of the imagination emerge through the aid of science to a plan on paper. Then it moves to realization in stone or metal or energy. Then it brings homes to men or women. Then it elevates the standard of living and adds to the comforts of life. This is the engineer's high privilege."

Herbert Clark Hoover



Mechanical Engineering

Mechanical Engineering at WPI

John M. Sullivan, Jr.

Interim Department Head

Mechanical Engineering

Director, Center for Comparative NeuroImaging

<http://www.wpi.edu/~sullivan>

<http://www.me.wpi.edu/>



Mechanical Engineering

Mechanical Engineering at WPI

Outline

- What is Mechanical Engineering?
- Mechanical Engineering at WPI.
- Sample Course Schedules.
- Question and Answer Session.



Mechanical Engineering

Mechanical Engineering at WPI

Mechanical Engineering is the
broadest and largest
engineering discipline.



Mechanical Engineering Introduction

- Mechanical Engineering deals with:
 - Power, engines, material processing, manufacturing
 - Design and analysis of structures and mechanical systems, flow of fluids, heat transfer
 - Machine design, product design, systems design
 - Lots of interaction with other disciplines:
 - Mechatronics involves electrical and mechanical
 - Robotics involves mechanical, electronic, computers
 - Biomechanical engineering melds engineering and biology



Mechanical Engineering

Mechanical Engineering at WPI

You cannot get through the day without interacting with things that were designed, analyzed, or manufactured by, or under the supervision of, mechanical engineers.



Mechanical Engineering

Mechanical Engineering
at
WPI



Mechanical Engineering at WPI

Statistics

WPI was established in 1868.

31 Full-time faculty plus several adjunct faculty in ME

692 Undergraduate students in Mechanical Engineering (in 4 yrs)

175 Graduate students (full and part-time)

Undergraduate Degrees awarded in

Mechanical Engineering

Aerospace Engineering

Robotics Engineering

Within Mechanical Engineering Degree can Concentrate in:

Aerospace, Biomechanical, Design, Manufacturing,

Material Science, Mechanics, Thermo-fluids



Mechanical Engineering at WPI

Flexible Curriculum

- Need 45 courses minimum to graduate from WPI.

What does this entail?

- (6) – Humanities Component (All majors)
- (2) – Social Science Courses (All majors)
- (3) – Interactive Qualifying Project (IQP) (All majors)
- (3) – Major Qualifying Project (MQP) (All majors)
- (1) – Physical Education (All majors)
- (12) – Math and Science Component (Required)
- (9) – Required ME Core Component (Required)
- (6) – Your Choice of ME Courses (Elective)
- (3) – Free Electives (Elective)



Mechanical Engineering at WPI

Flexible Curriculum

- (6) – Humanities Component (All majors)
 - <http://www.wpi.edu/academics/Depts/HUA/Requirements/index.html>
 - Breadth = select one course from 2 of the 3 intellectual clusters:
 - art/art history, drama/theatre, and music (AR, MU, TH);
 - languages, literature, and writing/rhetoric (EN, WR, RH, SP, GN);
 - history, philosophy and religion (HI, HU, PY, RE).
 - Depth = three courses in an area of focus that includes an inquiry seminar.
 - Inquiry Seminar = culmination of the H&A Requirement.
 - The Seminar explores a particular topic or theme in the humanities in greater depth. The Seminar has two primary goals: A) Foster independence of student thought, and B) Encourage a cooperative, dialogic approach to inquiry.
 - Setting is a small, intensive classroom setting (12 students or less).
 - http://www.wpi.edu/Images/CMS/HUA/Humanities_and_Arts_Requirement_Worksheet_revised_8-23-2010.pdf



Mechanical Engineering at WPI

Flexible Curriculum

■ (6) – Humanities Component (All majors)

Term:	A	B	C	D
1 st Yr.	HU-1	HU-2	HU-3	HU-4
2 nd Yr.		HU-5		HU-6

■ (2) – Social Science Courses (All majors)

- Social science is the scientific study of human thought and behavior, interpersonal relationships, and the institutional structure and functioning of human society.
- System Dynamics, Economics, Sociology, Psychology, and Political Science
- IQPs abroad requires ID/SS 2050. Social Science Research for the IQP.



Mechanical Engineering at WPI

Flexible Curriculum

- (6) – Humanities Component (All majors)
- (2) – Social Science Courses (All majors)

Term:	A	B	C	D	Notes
1 st Yr.	HU-1	HU-2	HU-3	HU-4	
2 nd Yr.		HU-5		HU-6 SS-1	Wait SS-2 for IQP
3 rd Yr.					
4 th Yr.					

- (3) – Interactive Qualifying Project (IQP) (All majors)
 - More than 60% of students do an IQP off campus (term abroad). Excellent opportunity to experience a different culture. It requires a course to expose you to the culture and/or social norms expected of the site. This also satisfies a SS requirement.



Mechanical Engineering at WPI

Flexible Curriculum

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- (3) – Interactive Qualifying Project (IQP) (All majors)
- (3) – Major Qualifying Project (MQP) (All majors)

Term:	A	B	C	D	Notes
1 st Yr.	HU-1	HU-2	HU-3	HU-4	
2 nd Yr.		HU-5		HU-6 SS-1	Wait SS-2 for IQP
3 rd Yr.		SS-2 (ID 2050)		IQP	
4 th Yr.	MQP	MQP	MQP		



Mechanical Engineering at WPI

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- (3) – Interactive Qualifying Project (IQP) (All majors)
- (3) – Major Qualifying Project (MQP) (All majors)
- (12) – Math and Science Component (Required)

Term:	A	B	C	D	Notes
1 st Yr.	HU-1 Calc-1 Phys-1	HU-2 Calc-2	HU-3 Calc-3	HU-4 Calc-4 Phys-2	
2 nd Yr.	Diff Eqns	HU-5	MS-(Lin Alg) Chem-1	HU-6 SS-1	Wait SS-2 for IQP
3 rd Yr.	MS-(Stats.)	SS-2 (ID 2050)	MS	IQP	
4 th Yr.	MQP	MQP	MQP	MS	



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- (12) – Math and Science Component (Required)
- (9) – Required ME Core Component (Required)

Term:	A	B	C	D	Notes
1 st Yr.	HU-1 Calc-1 Phys-1	HU-2 Calc-2	HU-3 Calc-3	HU-4 Calc-4 Phys-2	
2 nd Yr.	Diff Eqns ES-2501	HU-5 ES-2502	MS-(Lin Alg) Chem-1 ES-2001	HU-6 SS-1 ES-2503	Wait SS-2 for IQP
3 rd Yr.	MS-(Stats.) ES-3001	SS-2 (ID 2050) ES-3004	MS ES-3003	IQP	
4 th Yr.	MQP ME-3901	MQP EE-2010	MQP	MS	



Mechanical Engineering at WPI Flexible Curriculum

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- (3) – Major Qualifying Project (MQP) (All majors)
- (12) – Math and Science Component (Required)
- (9) – Required ME Core Component (Required)
- (6) – Your Choice of ME Courses (Elective)

Term:	A	B	C	D	Notes
1 st Yr.	HU-1 Calc-1 Phys-1	HU-2 Calc-2	HU-3 Calc-3	HU-4 Calc-4 Phys-2	
2 nd Yr.	Diff Eqns ES-2501	HU-5 ES-2502	MS-(Lin Alg) Chem-1 ES-2001	HU-6 SS-1 ES-2503	Wait SS-2 for IQP
3 rd Yr.	MS-(Stats.) ES-3001 ME-3XXX	SS-2 (ID 2050) ES-3004 ME-3XXX	MS ES-3003 ME-3XXX	IQP	
4 th Yr.	MQP ME-3901 ME-4XXX	MQP EE-2010 ME-4XXX	MQP	MS ME-4XXX	



Mechanical Engineering at WPI Flexible Curriculum

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- (3) – Major Qualifying Project (MQP) (All majors)
- (12) – Math and Science Component (Required)
- (9) – Required ME Core Component (Required)
- (6) – Your Choice of ME Courses (Elective)
- (3) – Free Electives (Elective)

Term:	A	B	C	D	Notes
1 st Yr.	HU-1 Calc-1 Phys-1	HU-2 Calc-2 ES-1310	HU-3 Calc-3 ME-1800	HU-4 Calc-4 Phys-2	Physical Education Distributed
2 nd Yr.	Diff Eqns OPEN ES-2501	HU-5 OPEN ES-2502	MS-(Lin Alg) Chem-1 ES-2001	HU-6 SS-1 ES-2503	Wait SS-2 for IQP
3 rd Yr.	MS-(Stats.) ES-3001 ME-3XXX	SS-2 (ID 2050) ES-3004 ME-3XXX	MS ES-3003 ME-3XXX	IQP	
4 th Yr.	MQP ME-3901 ME-4XXX	MQP EE-2010 ME-4XXX	MQP Elective OPEN	MS OPEN ME-4XXX	

Five-year BS/MS program

- A MS in Mechanical Engineering requires 30 credits
- The BS/MS allows 12 credits to count in both degrees
- The WPI undergraduate degree requires 45 courses or 135 credits, yet 144 credits are within the 4 years
- Using only the 12 credits double counted, a MS degree can be completed in the 5th year.
- Alternately, using the additional 9 credits within the 4 year UG schedule, a MS can be completed in 1 subsequent semester.

Questions?

