WESTMONT ENGINEERING CURRICULUM

STATUS UPDATE

The original engineering curriculum was approved by the faculty. Since then, Westmont hired a new director of engineering. The engineering steering committee has met numerous times and has revised the curriculum. The goals of the revision were to strengthen the liberal arts focus, enhance the engineering design content for the program and update specific technical content.

To strengthen the liberal arts focus we added a unit to the Engineering and the Liberal Arts course and added a Junior Design course with a service emphasis. This Junior Design course replaces the Interdisciplinary Seminar in the original curriculum. The Junior Design class will have a strong interdisciplinary component as it will be a course in design with an emphasis on service. As such it will implement a very user-centered design approach where we plan to involve faculty from other disciplines. We also added credit hours to the Senior Capstone Design 2-semester sequence. The full Westmont GE Liberal Arts Core Curriculum is maintained as well. To enhance the engineering design emphasis, we added the Junior Design course with service emphasis and added a credit to each of the two Senior Capstone Design courses. In addition, we will provide a thread of design and innovation throughout the entire engineering curriculum. Specific technical content that has been updated included removing a few courses where we saw redundancy, changing credit hours from some classes to align with what is normal at other schools and adding two electives which will be important for ABET accreditation.

ORIGINAL ENGINEERING CURRICULUM

Full Westmont GE Liberal Arts Core Curriculum

General Math/Science = 34 units

CHM 005 General Chemistry 1 (4)
MA 009, 010 Elementary Calculus I, II (4, 4)
MA 019 Multivariable Calculus (4)
MA/PHY XX Linear Algebra and Differential Equations (4)
PHY 021, 023 Physics I, II (4, 4)
PHY 022, 024 General Physics Laboratory I, II (1, 1)
PHY 142 Circuits and Electronics (4)
PHY 143 Electronics Laboratory (0)

Required Lower Division = 24 units

ME 005 Engineering and the Liberal Arts (2)
ME 010 Project Management (1)
ME 015 Engineering Economics (2)
ME 020 Engineering Graphics (2)
ME 030 Materials Engineering (4)
ME 040 Mechanics of Materials (4)
ME 055 Statics and Dynamics (4)
ME 060 Experimental Methods (3)

ME 080, 081 Project I, II (1, 1)

Required Upper Division = 31 units
ME 100 Control Systems (4)
ME 110 Fluid Mechanics (4)
ME 120 Thermodynamics (4)
ME 130 Heat Transfer Analysis (4)
ME 140 Instrumentation and Measurement (3)
ME 150 Manufacturing Processes (3)
ME 160 Mechanical Design (3) One of the following: (2)
ME 180 Project III (2)
ME 190 Engineering Practicum (2)
ME 181 Project IV (2)
ME 195 Seminar I: Engineering – An Interdisciplinary Approach (1)
ME 196 Seminar II: Faith, Technology, and Christian Responsibility (1)

REVISED ENGINEERING CURRICULUM

Full Westmont GE Liberal Arts Core Curriculum (No change)

General Math/Science = 34 units (no change)

Engineering Courses (reduced from 55 to 51 units)	
Engineering & the Liberal Arts	3
Statics & Engineering Software	3
Mechanics of Materials	3
Dynamics	4
Materials Engineering	3
Manufacturing Processes	3
Thermodynamics	4
Control Systems	3
Fluid Mechanics	3
Junior Design: interdisciplinary (Service-Learning)	3
Instrumentation & Measurement	3
Mechanical Design	3
Engineering Elective #1	3
Senior Design Capstone I	3
Senior Design Capstone II	3
Engineering Elective #2	3

Engineering Seminar: Faith, Technology, and
Christian Responsibility - Writing Intensive 1

SUMMARY OF CHANGES

Removed the following courses:

- Project management (topics covered in Senior Capstone Design)
- Engineering Economics (not a common core engineering class)
- Engineering Graphics (covered in a combination of Statics and Engineering Software and in Manufacturing)
- Experimental Methods (covered in Instrumentation & Measurement)
- Project I & II (covered with addition of junior design)
- Heat Transfer (covered somewhat in Thermodynamics)
- Project III & Project IV and Engineering Practicum (covered in senior design and have available internships)
- Seminar I: Engineering – An Interdisciplinary Approach (covered in Engineering and the Liberal Arts and also in Senior Capstone Design)

Added the following courses:

- Dynamics (was combined with statics)
- Junior Design (with service emphasis)
- Engineering Elective #1 (could be an upper level math or science course or an additional engineering course or could be fulfilled with an internship)
- Engineering Elective #2 (could be an upper level math or science course or an additional engineering course or could be fulfilled with an internship)
- Senior Capstone Design I and II (projects done with industry sponsorship)

Courses maintained but with credit hours reduced:

- Materials Engineering (reduced from 4 to 3 - this is normally a 3 credit course)
- Statics (reduced from 4 to 3 - this is normally a 3 credit course)
- Controls (reduced from 4 to 3 - this is normally a 3 credit course)
- Fluids (reduced from 4 to 3 - this is normally a 3 credit course)

Courses with added credit hours

- Engineering and the Liberal Arts (from 2 to 3)
- Junior Design with service emphasis (replaced Project I & II and went from two 1-unit classes to a single 3 unit class)
- Senior Capstone Design (replaced Project III & IV and went from 2 to 3 credits for each semester)

STATUS OF THE INDIVIDUAL COURSE SYLLABI

Courses with an approved syllabus:

- Engineering & the Liberal Arts
- Statics & Engineering Software

- Mechanics of Materials
- Dynamics
- Materials Engineering
- Manufacturing Processes

Courses that still need to have their syllabus approved:

- Thermodynamics
- Control Systems
- Fluid Mechanics
- Junior Design: interdisciplinary (Service-Learning)
- Instrumentation & Measurement
- Mechanical Design
- Engineering Elective #1
- Senior Design Capstone I
- Senior Design Capstone II
- Engineering Elective #2
- Engineering Seminar: Faith, Technology, and Christian Responsibility - Writing Intensive

B.S. OF ENGINEERING - Mechanical Concentration (Sample Schedule)

FIRST YEAR - Fall Semester	Units	Prerequisit(s)	FIRST YEAR - Spring Semester	Units	Prerequisit(s)
Engineering & the Liberal Arts	3	NA	Statics & Engineering Software	3	Calc I, Physics I
General Physics I (Common Inquiries #2)	4	NA	General Physics II	4	Calc I
General Physics I Lab (W.I.)	1	coreq Phy I	General Physics II Lab	1	coreq Phy II
Calculus I (Common Inquiries # 4; also QAR)	4	MA 08 or precalc	Calculus II	4	MA 09 (Calc I)
G.E. (Intro to New Testament)	4	NA	G.E. (Intro to Old Testament)	4	NA
P.E. (Fit for Life)	1	NA	P.E.	1	NA
Units this semester	17		Units this semester	17	

SOPHOMORE YEAR - Fall Semester	Units		SOPHOMORE YEAR - Spring Semester		
General Chemistry + Lab	4	NA	Dynamics	4	Statics
Multivariable Calculus	4	Calc II	Circuits & Electronics	4	Phy II & Calc II
G.E. (Christian Doctrine)	4	NA	Electronics Lab	0	coreq Circuits
G.E. (Writing for the Liberal Arts)	4	NA	Linear Algebra & Differential Equ.	4	Calc II
Mechanics of Materials	3	Statics	G.E. (World History)	4	NA
Units this semester	19		Units this semester	16	

ENGINEERING MAYTERM	Units	
Materials Engineering	3	Mechanics of Materials
Manufacturing Processes	3	Statics
Units this semester	6	

JUNIOR YEAR - Fall Semester	Units		JUNIOR YEAR - Spring Semester	Units	
Thermodynamics	4	Dynamics	Fluid Mechanics	3	Thermo
Control Systems	3	Dynamics	Junior Design: interdisciplinary (Service-Learning)	3	Junior status
G.E. (Foreign Language)	4	NA	G.E. (Common Inquiries #1 & #5)	4	NA
G.E. (Philosophical Reflections)	4	NA	G.E. (Common Inquiries #8)	4	NA
Optional: Engineering internship	0 to 3	Junior status	P.E	1	NA
			Optional: Engineering internship	0 to 3	Junior status
Units this semester	15		Units this semester	15	

Summer - internship 1 to 3 units	0 to 3	Junior status

SENIOR YEAR - Fall Semester	Units		SENIOR YEAR - Spring Semester	Units	
Instrumentation & Measurement	3	Thermo	Senior Design Capstone II	3	Sr Design I
Mechanical Design	3	Mechanics of Materials	Engineering Elective #2	3	Senior status
Engineering Elective #1	3	Senior status	G.E. (Common Inquiries #6 & #7)	4	NA
G.E. (Common Inquiries #3)	4		P.E.	1	Senior status
Senior Design Capstone I	3	Senior status	Engineering Seminar: Faith, Technology, and Christian Responsibility - Writing Intensive	1	Senior status
			Preperation for FE exam	0	NA
Units this semester	16		Units this semester	12	

Notes

Orange --> Core Science / Math courses

Black --> G.E. & P.E. courses

Red --> Engineering courses

G.E. and P.E. classes may be taken in a different order

An internship may be able to count for Engineering Elective credit

Upper level Science or Math courses (beyond the core science/math requirements) may be able to count as Engineering Electives