

PHYSICS, B.S.

MECHANICAL ENGINEERING SPECIALIZATION (ENGR)

(Fall 2016-Summer 2017)

PHYSICS BS COURSES/SUPPORTING COURSES (85 credits)

*Note: 2.0 GPA required in PHYS courses/B.S. degree

- _____ 5 PHYS 15200 Mechanics (C- or above)
- _____ 5 PHYS 25100 Heat, Electricity and Optics
- _____ 3 PHYS 30500 Intermediate Math Physics
- _____ 3 PHYS 32200 Intermediate Optics
- _____ 3 PHYS 32500 Scientific Computing
- _____ 3 PHYS 34200 Modern Physics
- _____ 1 PHYS 34300 Modern Physics Laboratory
- _____ 1 PHYS 34500 Optics Laboratory I
- _____ 1 PHYS 34600 Advanced Laboratory I
- _____ 3 PHYS 44200 Quantum Mechanics
- _____ 3 PHYS 48001 Senior Thesis I
- _____ 0 1 Class in PHYS 48002 Senior Thesis II

ENGINEERING CORE

- _____ 2 ENGR 12000 Graph Communication & Spatial Analysis
- _____ 2 ENGR 12100 Computer Tools for Engineers
- _____ 2 CS 22700 Introduction to C Programming
- _____ 1 CS 22800 Object Oriented Program in C++

MECHANICAL ENGINEERING SPECIALIZATION

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| _____ 4 PHYS 31200 Intermediate Electricity & Magnetism | _____ 3 ME 25100 Dynamics |
| _____ 3 PHYS 36100 Electronics for Scientists | _____ 3 ME 25200 Strength of Materials |
| _____ 3 ME 20000 Thermodynamics | _____ 3 ME <u>or</u> PHYS Approved Elective |
| _____ 3 ME 25000 Statics | _____ 3 ME <u>or</u> PHYS Approved Elective |

SUPPORTING CHEMISTRY & MATHEMATICS

- _____ 4 CHM 11500 General Chemistry
- _____ 4 MA 16500 Analytic Geometry & Calculus I (C- or above)
- _____ 4 MA 16600 Analytic Geometry & Calculus II (C- or above)
- _____ 4 MA 26100 Multivariate Calculus (C- or above)
- _____ 3 MA 35100 Elementary Linear Algebra (C- or above)
- _____ 3 MA 36300 Differential Equations

A&S BS LIBERAL ARTS REQUIREMENTS (14 credits — credits may vary with double counting/language placement – see advisor)

- _____ 3 Second Semester Writing (C- or higher) (ENG W140 or ENG W233)
 - _____ 3 Speaking Requirement (C- or higher) (COM 11400 or HIST H125)
 - _____ 8 Credits Language Sequence (credit/placement required for 2 semesters of foreign language)
 - _____ FL (1st semester) _____ FL (2nd semester—one course at second semester level required)
- Options: (Arabic, French, German, Japanese, Latin, Spanish)

GENERAL EDUCATION REQUIREMENTS (33 Credits)

*Note: grades of C- or higher required in Gen Ed/2.0 GPA

**Up to 6 credits in Gen Ed GA1 to GB7 and 3 credits GCAP (C8) may originate in major discipline—see advisor for more information.

- _____ 3 GA1 Category A1 -- Written Communication (See Bulletin or myBLUEprint for **General Education** courses)
- _____ 3 GA2 Category A2 -- Speaking and Listening
- _____ 3 GA3 Category A3 -- Quantitative Reasoning
- _____ 3 GB4 Category B4 -- Scientific Ways of Knowing
- _____ 3 GB5 Category B5 -- Social & Behavioral Ways of Knowing
- _____ 3 GB6 Category B6 -- Humanistic and Artistic Ways of Knowing
- _____ 3 GB7/71 Category B7 or B71 -- Interdisciplinary or Creative Ways of Knowing
- _____ 9 Additional Credits -- Category A or B General Education courses
- _____ 3 **GCAP Category C8--Capstone Experience** (IPFW course only)

MINOR/ELECTIVES (to reach 120 credits): _____

IPFW Residency Requirements: _____ 32 credits at 200 level or above at IPFW _____ with 15 of 32 credits at 300-400 in major
B.S. Requirements: _____ 120 credits _____ 30 credits 300-400 level _____ 2.0 GPA Degree/Gen Ed _____ C- or above in Gen Ed Courses

PHYSICS, B.S.

PLAN— MECHANICAL ENGINEERING SPECIALIZATION (ENGR)

(Fall 2016-Summer 2017)

Term: Year: 20				Term: Year: 20			
Course No.	Course Title	Pre-Reqs	Crs.	Course No.	Course Title	Pre-Reqs	Crs.
MA 165000 (GA3)	Analytic Geometry & Calculus 1	MA 159 or 154 (C- or above); placement	4	MA 16600	Analytic Geometry & Calculus II	MA 165 (C- or above)	4
CHM 11500 (GB4)	General Chemistry	H.S. CHM or CHM 111 (C- or above); MA 154, 227, 229 level	4	PHYS 15200 (Gen Ed A/B)	Mechanics	C: MA 166	5
PHYS 17000	Physics Seminar		1	CS 22700	Intro to C Programming	ENGR 121	2
COM 11400 or HIST H125 (GA2/A&S)	Fundament of Speech or Great Debates		3	CS 22800	Object Oriented Programming in C++	CS 227 or ENGR 221	1
ENGR 12000	Graph Communication & Spatial Analysis	MA 153	2	ENG W131 (GA1)	Read, Writ, & Inquiry I	Self-Place or ENG W129 (C- or above)	3
ENGR 12100	Comp Tools Engineers	MA 154 or 159 (C- or above); C: ENGR 120	2				
Total Semester Credit Hours			16	Total Semester Credit Hours			15

Term: Year: 20				Term: Year: 20			
Course No.	Course Title	Pre-Reqs	Crs.	Course No.	Course Title	Pre-Reqs	Crs.
MA 26100	Multivariate Calculus	MA 166 (C- or above)	4	MA 35100	Elem Linear Algebra	2 sem calc (C- or above grades)	3
PHYS 25100	Heat, Electricity, and Optics	PHYS 152 (C- or above); P or C: MA 261	5	MA 36300	Differential Equations	√	3
ENG W233 (Gen Ed A/B)	Intermed Expos Writing	ENG W131 (C- or above)	3	PHYS 34200	Modern Physics	PHYS 241 or 251 or 261	3
ME25000	Statics	PHYS 1520; C: MA 261	3	PHYS 34300	Modern Physics Lab	C: PHYS 342	1
				PHYS 31200	Intermed Elect & Mag	PHYS 251 and MA 363	3
				GB5	Gen Ed Social/Behavior		3
Total Semester Credit Hours			15	Total Semester Credit Hours			16

Term: Year: 20				Term: Year: 20			
Course No.	Course Title	Pre-Reqs	Crs.	Course No.	Course Title	Pre-Reqs	Crs.
ME 25100	Dynamics	ME 250; P or C: 363	3	ME 25200	Strength of Materials	ME 250; C: MA 363	3
ME 20000	Thermodynamics I	CHM 115; C: MA 261	3	PHYS 30500	Intermed Math Physics	PHYS 251	3
PHYS 36100	Electronics for Scientists	PHYS 251/equiv	4	PHYS 32200	Intermediate Optics	PHYS 251/equiv	3
PHYS 34600	Advanced Lab I	PHYS 343	1	PHYS 34500	Optics Lab I	C: PHYS 322	1
ME or PHYS Approved Elect	ME or Physics (Approved elective)	√	3	GB6	Gen Ed Hum/Artistic		3
				Gen Ed A/B	Gen Ed A or B course		3
Total Semester Credit Hours			14	Total Semester Credit Hours			16

Term: Year: 20				Term: Year: 20			
Course No.	Course Title	Pre-Reqs	Crs.	Course No.	Course Title	Pre-Reqs	Crs.
PHYS 32500	Scientific Counting	√	3	PHYS 48002	Senior Thesis II	√	0
PHYS 44200	Quantum Mechanics	PHYS 342 and MA 363 (C- or above)	3	FL 12	Foreign Language 2	FL1/ placement	4
PHYS 48001 (C8)	Senior Thesis I	√	3	GB7/71	Gen Ed Creat/Interdisc		3
FL11	Foreign Language 1		4	ME or PHYS Approved Elect	ME or Physics (Approved elective)	√	3
@ @	Free elective		3	Elective	Free elective		2
Total Semester Credit Hours			16	Total Semester Credit Hours			12

√ = See IPFW Bulletin or myBLUEprint for additional course prerequisites

Summer Courses:

**120 credits required for Bachelor of Science degree
2.0 GPA required for Bachelor of Science degree/major**