

Bachelor of Science in Materials Science and Engineering
College of Engineering
Checksheet Effective Graduating Class of 2007

Freshman Year			Fall	Spring	Sophomore Year			Fall	Spring
CHEM	1074	General Chemistry Engr	3		MSE	2044	Fund of Materials Eng [2]	3	
CHEM	1084	General Chemistry Lab Engr	1		MSE	2054	Fund of Materials Science		3
EF	2984	Engineering Explorations [1]	2		MSE	2884	Mat E Prof Dev	1	
EF	1016	Intro to Engineering II [1]		2	MSE	3304	Physical Metallurgy		3
ENGL	1105/1106	Freshman English I/II	3	3	MSE	3314	Physical Metallurgy Lab		1
MATH	1114	Linear Algebra	2		ESM	2104/2204	Statics/Deformable Bodies	3	3
MATH	1224	Vector Geometry		2	ISE	2214	Manufacturing Proc. Lab		1
MATH	1205/1206	Calculus I/II	3	3	MATH	2224	Multivariable Calculus	3	
PHYS	2305	Foundations of Physics I		4	MATH	2214	Intro Differential Equations		3
		Elective (Area 6)	1		PHYS	2306	Foundations of Physics I	4	
		Elective (Area 2/3)		3			Elective (Area 2/3)	3	
							Program Elective I [3]		2
TOTAL CREDITS			15	17	TOTAL CREDITS			17	16

Junior Year			Fall	Spring	Senior Year			Fall	Spring
MSE	3024	Kinetic Processes		2	MSE	4055/4056	Mat Select. & Design I/II	3	3
MSE	3034	Transport Processes	2		MSE	4075/4076	Senior Project Lab I/II [6]	1	1
MSE	3134	X-Ray Diffraction		4	MSE	4085/4086	Senior Project Recitation I/II	2	1
MSE	3884	Mat E Prof Dev II		1	MSE	4900	Communications MSE [7]		1
MSE	4034	Thermo of Materials	3		ISE	2014	Engineering Economy [8]	2	
MSE	4414	Physical Ceramics	3				Technical Elective [5]	3	3
MSE	4424	Physical Ceramics Lab	1				Technical Elective [5]	3	3
MSE	4554	Polymer Engineering		3			Elective (Area 2/3)	3	
MSE	4564	Polymer Engineering Lab		1			Elective (Area 7)		3
ECE	3054	Electrical Theory		3					1
		Program Elective II [4]	4						
		Technical Elective [5]		3					
		Elective (Area 2/3)	3						
TOTAL CREDITS			16	17	TOTAL CREDITS			17	15

A total of 130 credits is required for graduation. There are no hidden prerequisites in this program of study. This checksheet assumes two years of high school level foreign language. Students deficient in this requirement may need to take additional credits to satisfy the University foreign language requirement. Any additional credits taken to satisfy the foreign language requirement cannot be used to fulfill degree requirements.

In addition to any University policies regarding satisfactory progress, student must pass MSE 2044, 2884, 3304, and 3314 with a collective GPA of at least 2.0 in order to demonstrate satisfactory progress towards the MSE degree and to be permitted to take any other courses in the major.

A student must achieve an overall GPA of 2.0 and a GPA of 2.0 or better in all MSE courses for graduation.

- Notes:
- [1] Students may substitute EngE 1024/1114 or EngE 1024/1104 or EF 1015/1016 for EF 2984/1016
 - [2] Transfer students from another department or university may conditionally substitute MSE 2034 for MSE 2044.
 - [3] Program Elective I -Choose EF 2314 C++ (2); STAT 3704 Statistics for Eng (2); ME/MATH 2004 Engineering Analysis Using Numerical Methods (2); or ESM 2074 Computational Methods (3).
 - [4] Program Elective II - Students are required to take either (a) or (b) below. Choice (a) is for students with a general interest and for those wishing to emphasize ceramics, metals, or polymers. Choice (b) is for those wishing to emphasize electronic, magnetic, and photonic materials.
 - (a) MSE 3054 Mechanical Behavior (2 credits), MSE 3064 Mechanical Behavior Lab (1 credit), and MSE 4354 Strength and Fracture (1 credit).
 - (b) PHYS 3455 Quantum and Solid State Physics (4 credits).
 - [5] All technical electives must be taken for a grade (Pass/Fail not acceptable)
 - [6] Honors students may substitute MSE 4095/4096 Honors Senior Project Lab for MSE 4075/4076
 - [7] MSE 4900 fully satisfies the Communications Intensive requirement as being equivalent to 6 credit hours of WI instruction.
 - [8] Students may substitute ECON 2005 Microeconomics (3) for ISE 2014 Engineering Economy

Elective Requirements Effective Graduating Class of 2007

TECHNICAL ELECTIVES: Fifteen (15) credits are required from the list below. These are categorized into various areas to aid students who might want to emphasize one or more of these subdisciplines. Courses not listed may be counted as Technical Electives only by special approval; initiate requests through the MSE Undergraduate Services Coordinator.

Areas of Potential Emphasis: C = Ceramics; M = Metals; P = Polymers; E = Electronic, magnetic and photonic materials; B = Biomaterials. X = high relevance; x = relevance

Course		Cr	C	M	P	E	B	Course		Cr	C	M	P	E	B
MSE	3054	2	x	X	x	x	x	CHEM	2546	1					
MSE	3064	1	x	X	x	x	x	CHEM	3114	3	x	x	x	x	X
MSE	3104	3	X					CHEM	3615	3	x	x	x	x	x
MSE	3124	1	X					CHEM	3616	3	x	x	x	x	x
MSE	3424	3	X [1]	X				CHEM	4424	3	x	x	x	x	x
MSE	4024	3	x	x	x		x	CHEM	4534	3			X		
MSE	4124	3	x	x	x			CHEM	4654	3			X		x
MSE	4154	3	x	x	x	x	x	ECE	3254	3					
MSE	4164	3		X		X	x	ECE	3254	3				X [1]	
MSE	4234	3				X		ESM	2074	3	x	x	x	x	x
MSE	4235	3				X		ESM	4024	3	x	X			
MSE	4236	3				X		ESM	4044	3	x	x	x		
MSE	4254	3	x	x	x			ESM	4054	3	x	x			
MSE	4274	1				X		ESM	4105/06	3					X
MSE	4304	3		X [1]				ISE	2204	2	x	X	x		
MSE	4354	1	x	X	x	x	x	MATH	4564	3	x	x	x	x	x
MSE	4434	3	X [1]					PHYS	3405	3				X	
MSE	4534	3			X			PHYS	3455	3				X	
MSE	4574	3	x	x	x		X [1]	PHYS	3456	3				X	
MSE	4604	3	x	x	x			PHYS	4614	3				x	
								PHYS	4624	1				x	
BIOL	2405	3						STAT	4604	3	x	x	x	x	x
BSE	3415	3													
CHEM	2535	3													
CHEM	2536	3			X [1]		x								
CHEM	2545	1			X		x								

Notes: [1] Fundamental course recommended for this area of emphasis

[2] These courses may be counted towards the technical elective requirement if not used as a program elective option as presented on the previous page

[3] ECE 3254 is a prerequisite for MSE 4235-36, and this prerequisite must be taken in the summer after Junior year for 4235-36 to be completed in the senior year

[4] MSE 4034 can replace CHEM 3615 as a prerequisite for MSE 4534, and also for CHEM 4654

[5] Prerequisite is CHEM 2536

[6] ECE 3254 can replace ECE 3204 as a prerequisite for ECE 4214

UNIVERSITY CORE CURRICULUM ELECTIVES: Areas 1, 4, and 5 are already satisfied by required courses. Additional requirements are:

Area 2 – Ideas, Cultural Traditions, and Values (6 credits) _____

Area 3 – Society and Human Behavior (6 credits) _____

Area 6 – Creativity and Aesthetic Experience (1 credit) _____

Area 7 – Critical Issues in a Global Context (3 credits) _____

If a University Core curriculum course that double counts in two different core areas is selected, unfulfilled credits must be replaced with a free elective so that graduation credits sum to 130.



VIRGINIA POLYTECHNIC INSTITUTE
AND STATE UNIVERSITY

Academic Affairs

College of Engineering
212 Hancock Hall, Blacksburg, VA 24061-0275
(540) 231-3244 Fax (540) 231-1831

Date: June 1, 2004 **UPDATED January 2005**

To: Engineering Undergraduates

From: Belee Watford, Associate Dean, Academic Affairs

Subject: Non-degree credit

Please be aware that not all courses which you have taken at Virginia Tech will count toward an undergraduate engineering degree. Such courses may not be used to satisfy any graduation requirement, including free electives. Listed below are courses which do not count toward an undergraduate engineering degree. You should also check with your engineering department about additional departmental non-credit courses. [This list is updated periodically.](#) Be sure to review the list each semester at:

http://www.eng.vt.edu/overview/acad_affairs_whatwedo.php

AtSc or COS 2984 (Athletic Transitions, Exploring Careers)

CS 1004 (Computer Literacy), (no credit awarded to CS majors for these courses: CS 4004, 4014)

CEE 4984 (Review of CE Fundamentals of FE Exam)

EDCI 1004, 1014, 2984 (College Success Strategies, Cadet Success Strategies)

EDHL 2984 (First Year Seminar, Resident Education, Leadership from International Perspective, Healthy Living), EDHL 4964 (Field Study), EDHL 4984 (Orientation Skills, Orientation/Peers, Orientation/Leader), EDHL 4974 (Wing Student Teaching Assistant)

EF/ENGE 2984 (Engineering Success Seminar)

Engl 1004, 0014 (English as a Second Language)

ENGR 2984 (C Aspire Seminar, College Success Strategies for Engineers, Engineering Success Strategies, Women in Engineering, Hypatia Seminar, Second Year Hypatia Seminar, Engineering Honors Seminar, Freshman Engineering Seminar, Undergraduate Research Seminar, Mentoring Seminar)

ESM 2984 (ESP Statics), ESM 4404 (Fundamentals of Professional Engineering)

FCD 2984 (Success Project)

HD 2984 (Healthy Living, Success Project)

MaSc 1024 (Mathematics, A Liberal Arts Approach), 1034 (Statistics, A Liberal Arts Approach), 1044 (Computer Science, A Liberal Arts Approach)

Math 1504 (PreCalc), 2984 (Emerging Scholar), 1015 (Elem Calc with Trig. CS majors may receive 1015 credit if taken before 1205), 1016 (Elementary Calc with Trig), 1525-1526 (Elementary Calc with Matrices), 2015-2016 (Elementary Calc with Trig II)

Phys 2205-2206 (General Physics, not Calc-based)

Psyc 2984 (First Year Experience, Athletic Transitions)

Bachelor of Science in Materials Science and Engineering
College of Engineering
Checksheet Effective Graduating Class of 2007

2007 MSE Checksheet by category
 130 credits required to graduate

I. Humanities/Social Sciences (22 cr.)

ENGL 1105	Freshman English I	3
ENGL 1106	Freshman English II	3
Electives CC Areas 2/3, 6		16

II. Math/Statistics (18 cr.)

MATH 1114	Linear Algebra	2
MATH 1224	Vector Geometry	2
MATH 1205	Calculus I	3
MATH 1206	Calculus II	3
MATH 2224	Multivariable Calculus	3
MATH 2214	Intro Differential Eqns	3
Program Elective I		2

III. Science (15 or 19 cr.)

CHEM 1074	General Chemistry Eng	3
CHEM 1084	General Chemistry Lab	1
MSE 2054	Fund of Materials Sci	3
PHYS 2305	Foundations of Physics I	4
PHYS 2306	Foundations of Physics I	4
Program Elective II ¹		4 or 0

IV. Engineering Subjects (19 or 23 cr.)

EF 1015	Intro to Engineering I	2
EF 1016	Intro to Engineering II	2
ECE 3054	Electrical Theory	3
ESM 2104	Statics	3
ESM 2204	Deformable Bodies	3
ISE 2014	Engineering Economy	2
ISE 2214	Manufacturing Proc Lab	1
MSE 2044	Fund of Materials Eng	3
Program Elective II ²		4 or 0

V. MSE Core Courses (37 cr.)

MSE 2044	Fund Materials Eng ³	
MSE 2054	Fund Materials Science ⁴	
MSE 2884	Materials Eng Prof Dev I	1
MSE 3884	Materials Eng Prof Dev II	1
MSE 3024	Kinetic Processes	2
MSE 3034	Transport Processes	2
MSE 3134	X-ray Diffraction	4
MSE 3304	Physical Metallurgy	3
MSE 3314	Physical Metallurgy Lab	1
MSE 4414	Physical Ceramics	3
MSE 4424	Physical Ceramics Lab	1
MSE 4554	Polymer Engineering	3
MSE 4564	Polymer Engineering Lab	1
MSE 4034	Thermo of Materials	3
MSE 4055	Material Sel and Design I	3
MSE 4056	Material Sel and Design II	3
MSE 4075	Senior Project Lab I	1
MSE 4076	Senior Project Lab II	1
MSE 4085	Senior Project Recitation I	2
MSE 4086	Senior Project Recitation II	1
MSE 4894	Communications Portfolio	1

VI. Technical Electives from approved list (15 cr.)

List includes:

- 11 elective courses from MSE
- 4 core courses from MSE
- 1 course from BIOL
- 1 course from BSE
- 9 courses from CHEM
- 2 courses from ECE
- 5 courses from ESM
- 2 courses from GEOL
- 1 course from ISE
- 1 course from MATH
- 1 course from ME
- 5 courses from PHYS
- 1 courses from STAT

¹ Students wishing to emphasize electrical, optical, and magnetic materials take MSE3255/PHYS3455 – Intro to Solid State Physics – as Program Elective II.

² Students wishing to emphasize ceramics, metals, or polymers take MSE 3054/64 – Mechanical Behavior of Materials - as Program Elective II.

³ Included in Science category

⁴ Included in Engineering Subjects category