Sept 2016

to Civil & Env Eng erials erials Lab nistry for Engr nistry Lab ge Comp Ilus I Ilus III cs neering Physics II eying Principles C W S C P A ¹	1	CIE 101 CIE 115 MAT 127 PHY 121 SPRING SEN CIE 225 ECP 225 MAT 258 MEE 251	Civil Eng Graphics Computing in CE Calculus II Engr Physics I HVSC W S C P A ¹	3 4 4 3 17 HOURS 3 1 4 3 7 4	Grade
erials erials Lab nistry for Engr nistry Lab ge Comp Ilus I Ilus II eving Physics II eving Principles C W S C P A ¹	3 1 3 1 3 4 16 HOURS Grade 4 3 4 3 17	CIE 115 MAT 127 PHY 121 SPRING SEN CIE 225 ECP 225 MAT 258 MEE 251	Computing in CE Calculus II Engr Physics I HVSC W S C P A ¹	3 4 4 3 17 HOURS 3 1 4 3 7 4	Grade
erials Lab nistry for Engr nistry Lab ge Comp Ilus I Ilus II cs neering Physics II eying Principles C W S C P A ¹	1 3 1 3 4 16 HOURS Grade 4 3 3 17	MAT 127 PHY 121 SPRING SEN CIE 225 ECP 225 MAT 258 MEE 251	Calculus II Engr Physics I HVSC W S C P A ¹ MESTER Transportation Engr ² CE Tech Writing I Diff Eq & Lin Alg Strength of Materials Approved Sci. Elective	4 4 17 HOURS 3 1 4 3 7 4	Grade
nistry for Engr nistry Lab ge Comp Ilus I Ilus III cs neering Physics II eying Principles C W S C P A ¹	3 1 3 4 16 HOURS Grade 4 3 3 17	PHY 121 SPRING SEN CIE 225 ECP 225 MAT 258 MEE 251	Engr Physics I HVSC W S C P A ¹	4 3 17 HOURS 3 1 4 3 7 4	Grade
nistry Lab ge Comp Ilus I Ilus III cs neering Physics II eying Principles C W S C P A ¹ .	1 3 16 HOURS Grade 4 3 3 17	SPRING SEN CIE 225 ECP 225 MAT 258 MEE 251	HVSC W S C P A ¹ MESTER Transportation Engr ² CE Tech Writing I Diff Eq & Lin Alg Strength of Materials Approved Sci. Elective	3 17 HOURS 3 1 4 3 7 4	Grade
ge Comp Ilus I Ilus III cs heering Physics II eying Principles C W S C P A ¹	3 4 16 HOURS Grade 4 3 3 17	SPRING SEN CIE 225 ECP 225 MAT 258 MEE 251	MESTER Transportation Engr ² CE Tech Writing I Diff Eq & Lin Alg Strength of Materials Approved Sci. Elective	17 HOURS 3 1 4 3 7 4	Grade
Ilus III cs heering Physics II eying Principles C W S C P A ¹ .	4 16 HOURS Grade 4 3 4 3 17	SPRING SEM CIE 225 ECP 225 MAT 258 MEE 251	MESTER Transportation Engr ² CE Tech Writing I Diff Eq & Lin Alg Strength of Materials Approved Sci. Elective	HOURS 3 1 4 3 ⁷ 4	Grade
Ilus III cs neering Physics II eying Principles C W S C P A ¹ .	16 HOURS Grade 4 3 4 3 3 17	SPRING SEN CIE 225 ECP 225 MAT 258 MEE 251	MESTER Transportation Engr ² CE Tech Writing I Diff Eq & Lin Alg Strength of Materials Approved Sci. Elective	HOURS 3 1 4 3 ⁷ 4	Grade
Ilus III cs heering Physics II eying Principles C W S C P A ¹ .	HOURS Grade 4 3 4 3 3 17	SPRING SEN CIE 225 ECP 225 MAT 258 MEE 251	MESTER Transportation Engr ² CE Tech Writing I Diff Eq & Lin Alg Strength of Materials Approved Sci. Elective	HOURS 3 1 4 3 7 4	Grade
Ilus III cs neering Physics II eying Principles C W S C P A ¹ .	4 3 3 17	CIE 225 ECP 225 MAT 258 MEE 251	Transportation Engr ² CE Tech Writing I Diff Eq & Lin Alg Strength of Materials Approved Sci. Elective	3 1 4 3 ⁷ 4	
cs neering Physics II eying Principles C W S C P A ¹	3 4 3 17	ECP 225 MAT 258 MEE 251	CE Tech Writing I Diff Eq & Lin Alg Strength of Materials Approved Sci. Elective	1 4 3 ⁷ 4	
neering Physics II eying Principles C W S C P A ¹ .	4 3 3 17	MAT 258 MEE 251	Diff Eq & Lin Alg Strength of Materials Approved Sci. Elective	4 3 ⁷ 4	
eying Principles C W S C P A ¹	3 3 17	MEE 251	Strength of Materials Approved Sci. Elective	3 ⁷ 4	
C W S C P A ¹ .	3 17		Approved Sci. Elective	7 4	
	17				
				15	
Env Eng	HOURS Grade	SPRING SEN	MESTER	HOURS	Grade
EIIV EIIg	3		Soil Mechanics	3	
	2		Statistics for Engr	2	
	3	313 332		24	
	1			34	
of Public Comm	3		CIE Elective	34	
CWSCPA ⁺	<u> </u>		Engr Sci Elect	<u>3</u> 16	
	HOURS Grade	SPRING SEN	MESTER	HOURS	Grade
Decisions ⁶	2		Engineering Ethics	1	Grade
2,6	2		Engricering Ethics	1 2	
	<u>۲</u>		Engr Project Design	5 n 1	
	1	ECP 411		h T	
lective -	34			34	
. 31	34		CIE/Tech Elect ^{3,4}	34	
lective ^{3, 4}	34		HVSC W S C P A ¹	3	
lective ^{3, 4} Tech Elect ^{3, 4}				14	
lective ^{3, 4} Tech Elect ^{3, 4} C W S C P A ¹	3				
	Decisions ⁶ ect Mgmt ^{2,6} ech Writing II lective ^{3,4} lective ^{3,4} Tech Elect ^{3,4}	HOURS GradeDecisions 6 2Dect Mgmt $^{2, 6}$ 2ech Writing II1Iective $^{3, 4}$ 3Iective $^{3, 4}$ 3 <td>HOURS GradeSPRING SEMDecisions 62CIE 410ect Mgmt $^{2, 6}$2CIE 411ech Writing II1ECP 411lective $^{3, 4}$34lective $^{3, 4}$3Tech Elect $^{3, 4}$3C W S C P A¹3</td> <td>HOURS GradeSPRING SEMESTERDecisions 62CIE 410Engineering Ethicsect Mgmt $^{2, 6}$2CIE 411Engr Project Designech Writing II1ECP 411Tech Writing Worksholective $^{3, 4}$34CIE Lective $^{3, 4}$lective $^{3, 4}$34CIE/Tech Elect $^{3, 4}$rech Elect $^{3, 4}$34HVSCW S C P A134HVSC W S C P A1</td> <td>HOURS GradeSPRING SEMESTERHOURSDecisions62CIE 410Engineering Ethics1ect Mgmt2,62CIE 411Engr Project Design3ech Writing II1ECP 411Tech Writing Workshop1lective3,434CIE Elective3,43lective3,434CIE/Tech Elect3,43ech Elect3,43414</td>	HOURS GradeSPRING SEMDecisions 6 2CIE 410ect Mgmt $^{2, 6}$ 2CIE 411ech Writing II1ECP 411lective $^{3, 4}$ 34lective $^{3, 4}$ 3Tech Elect $^{3, 4}$ 3C W S C P A ¹ 3	HOURS GradeSPRING SEMESTERDecisions 6 2CIE 410Engineering Ethicsect Mgmt $^{2, 6}$ 2CIE 411Engr Project Designech Writing II1ECP 411Tech Writing Worksholective $^{3, 4}$ 34CIE Lective $^{3, 4}$ lective $^{3, 4}$ 34CIE/Tech Elect $^{3, 4}$ rech Elect $^{3, 4}$ 34HVSCW S C P A134HVSC W S C P A1	HOURS GradeSPRING SEMESTERHOURSDecisions 6 2CIE 410Engineering Ethics1ect Mgmt 2,6 2CIE 411Engr Project Design3ech Writing II1ECP 411Tech Writing Workshop1lective 3,4 34CIE Elective 3,4 3lective 3,4 34CIE/Tech Elect 3,4 3ech Elect 3,4 3414

TOTAL CREDIT HOURS = 129

EXPLANATION OF REQUIREMENTS

1. Students are assisted by faculty advisors in developing an elective program to meet their individual needs within the University's general education requirements. While most of the general education requirements are automatically met with a civil engineering degree, a student is required to select an additional 15 credit hours of electives to help meet the 18 credit hour "Human Values and Social Context" requirement (**REQUIRED**: **CMJ 103 satisfies the other three credit hours**),

2. General education requirements mandate two writing intensive courses. CIE 225 and CIE 413 are designated as writing intensive courses within the CIE major, while ECP 411 meets the outside the major writing intensive course. **NOTE:** CIE 225 must be taken concurrently with ECP 225 and CIE 413 must be taken concurrently with ECP 413 for CIE 225 and CIE 413 to count as writing intensive courses.

3. Civil Engineering and technical electives must be a minimum of 21 credit hours with no more than two technical elective courses. Civil engineering electives are advanced (400 or 500 level) civil engineering courses. The technical elective is an advanced Civil Engineering course or CIE 394 Civil Engineering Practice or other advanced level engineering, science, or mathematics course relevant to Civil Engineering. In addition, ERS 101 Intro to Geology, BIO 100 Basic Biology and CHY 122/124 can be taken as technical electives.

4. An additional requirement of the CIE Electives is that students take a CIE elective course in three of the five civil engineering sub-disciplines: Transportation (CIE 42X), Environmental (CIE 43X), Structural (CIE44X), Water Resources (CIE 45X), and Geotechnical (CIE 46X).

5. Three credits of approved engineering science electives, usually in mechanical or electrical engineering, are required. Civil Engineering courses cannot be used for these three specific credit hours. Typical courses taken are:

MEE

270

Dynamics

MEE 230 Thermodynamics I

ECE 209 Fundamentals of Electric Circuits

6. CIE 413 must be taken in the fall semester immediately preceding CIE 411.

7. Courses satisfying the Approved Science Elective are: BIO 100 Basic Biology, ERS 101 Introduction to Geology, ERS 102 Environmental Geology of Maine, EES 140/141 Soil Science and SMS 302/303 Oceanography

SPECIAL NOTE:

Sixteen credit hours of engineering design courses are required. Eleven hours are earned in the required courses. At least five additional design hours must be included in the electives selected by the student. The College of Engineering only allows seniors whose "advancement in the field will permit their taking a graduate level course among graduate students without disadvantage to themselves" to take 500-level courses. The design content of CIE electives are as follows:

	0	0	0				
Course No.	*	Engr. Design	Engr. Science	Course No.	*	Engr. Design	Engr. Science
CIE 394		1-3	0	CIE 533	Е	0	3
CIE 424	Т	2	1	CIE 534	E	0	3
CIE 425	Т	1	2	CIE 537	Е	0	3
CIE 426	Т	3	0	CIE 540	S	0	3
CIE 427	Т	1	0	CIE 543	S	2	1
CIE 430	Е	3	1	CIE 544	S	4	0
CIE 431	Е	3	0	CIE 545	S	0	3
CIE 432	Е	3	0	CIE 547	S	3	0
CIE 434	Е	4	0	CIE 548	S	3	0
CIE 439	Е	0	3	CIE 549	S	0	3
CIE 440	S	0	4	CIE 556	W	1	2
CIE 442	S	4	0	CIE 562	G	3	0
CIE 443	S	4	0	CIE 563	G	1	1
CIE 450	W	1	2	CIE 564	G	3	0
CIE 455	W	1	2	CIE 565	G	3	0
CIE 456	W	1	2	CIE 566	G	3	0
CIE 460	G	3	0	CIE 567	G	3	0
CIE 480		0	3				

Engineering Science & Design Content of Departmental Electives

• T = transportation; E = environmental; W = water resources; S = structures; G = geotechnical

University of Maine Courses Meeting CIE Technical Elective Requirements

¹Biochemistry, Microbiology & Molecular Biology BMB 322 Biochemistry

¹Biological Engineering

BLE 462	Power	Transmission	and	Control
---------	-------	--------------	-----	---------

Biology	
BIO 100	Basic Biology
BIO 200	Biology of Organisms
BIO 222	Biology: The Living Science
BIO 319	General Ecology

BIO 319 **BIO 468** Limnology

¹Chemical Engineering

	0 0	
CHE 420	Colloid Technology	
CUTE 400		

CHE 480 Pollution Prevention in Industrial Ecology

Chemistry

CHY 122	The Molecular Basis of Chemical Changes
CHY 242	Principles of Quantitative Analysis and Solution Equilibria
CHY 251	Organic Chemistry I
CHY 252	Organic Chemistry II
CHY 443	Instrumental Analysis
CHY 471	Physical Chemistry I
CHY 472	Physical Chemistry II

¹Civil & Environmental Engineering CIE 394/498/598 courses

Computer Science

COS 215	Introduction to Computing Using FORTRAN
COS 220	Introduction to C++ Programming

COS 221 Advanced C++ Programming

Construction Management

- **CET 360** Construction Estimating and Bidding
- **CET 412** Sustainable Population and Environmental Design and Construction
- **CET 462 Construction Planning and Scheduling**

Earth Science

- ERS 101 Introduction to Geology
- ERS 102 Environmental Geology of Maine
- ERS 210 Geology Applied to Engineering
- ERS 315 Principles of Sedimentology and Stratigraphy
- ERS 316 Structural Geology
- ERS 317 Introduction to Geophysics
- **Energy Resources and Climate Change** ERS 369
- Computation in Earth Science ERS 420
- ERS 441 Glaciers and Our Landscape
- ERS 461 Fluvial Processes in Geomorphology

Ecology and Environmental Science

EES 418	Environmental Assessment and Management Techniques
EEG 450	

Policy

EES 450 Principles of Environmental Science

Economics

200110111105	
ECO 341	Waste Management
ECO 366	Applied Data Analysis for Resource Economics and Pol
ECO 377	Introduction to Natural Resource Economics and Policy

- ECO 381 Sustainable Development Principles and Policy
- ECO 405 Sustainable Energy Economics & Policy
- ECO 473 Economic and Policy Applications of GIS
- ECO 477 Economics of Environmental and Resource Management
- ECO 479 Land Use Planning
- ¹Electrical and Computer Engineering

ECE 209 Fundamentals of Electrical Circuits

- Electrical Engineering Technology
- EET 321 Electro-Mechanical Energy Conversion
- EET 323 Power Systems Analysis
- EET 460 Renewable Energy and Electricity Production

Global Positioning Systems

400 level courses

Information Systems Engineering

- ISE 303 Human-Computer Interaction
- ISE 304 Digital Image Processing
- ISE 305 Digital Video Analysis
- ISE 403 Spatial Database Systems
- ISE 404 Time in Information Systems Design

Marine Sciences

- SMS 302 Oceanography
- SMS 402 Oceans and Climate Change

Mathematics

MAT 400 Topics in Mathematics

- MAT 453 Partial Differential Equations I
- MAT 471 Differential Geometry

¹Mechanical Engineering

- MEE 230 Thermodynamics I
- MEE 270 Applied Mechanics: Dynamics
- Plant, Soil & Environmental Science
- PSE 140 Soil Science
- PSE 344 Soil and Water Quality: Human Impacts on the Environment
- PSE 413 Wetland Delineation and Mapping
- PSE 423 Wetland Ecology and Conservation

School of Forestry Resources

- SFR 400 Applied Geographic Information Systems
- SFR 454 Wood Composites
- SFR 455 Bioenergy Sources, Systems and Environmental Effects
- SFR 482 Industrial Ecology and Life Cycle Assessment

Surveying Engineering Technology

- SVT 329 Site Planning and Subdivision Design
- SVT 331 Photogrammetry
- SVT 341 Advanced Surveying
- SVT 437 Practical GPS

Wildlife Ecology

WLE 423 Wetland Ecology and Conservation

Notes:

¹ 300/400/500 level courses in CIE, other engineering disciplines, and math and sciences are typically accepted. Refer to Advisor for approval of courses in other engineering disciplines designated as 498 or 598.

Refer courses (including those for the Renewable Energy Minor) not listed to Advisor for approval.