



University Courses & Curricula Committee 2020-2021

March 17th, 2021
Zoom Host
12:45pm-2:45pm

Call to Order 12:45pm

- Welcome from Chair Wendy Krause
- Remarks and Updates from OUCCAS/DASA
- Approval of UCCC March 3rd, 2021 Minutes
- Course and Curricular Business

New Business

Consent Agenda		
Action	Type	Notes
ACC 440 Enterprise Resource Planning Systems	Minor	Updating prerequisites.
EC 437 Health Economics	Drop	Course has not been taught in several years; no plans to teach course in the future.
EC 480 Introduction to Economic Research	Drop	Resources no longer available; replaced in the degree requirements
FTM 282 Marketing Fundamentals in Textiles and Apparel	Minor	Revisions: Title, Abbr. Title
FTM 382 Brand Management in Textiles and Apparel	Minor	Revisions: Title, Abbr. Title, Catalog Description
FTM 482 Global Brand Management in Textiles and Apparel	Minor	Revisions: Title, Abbr. Title
14CONBS Construction Engineering (BS)	Minor	Revisions: Title, Moving Courses, Electives
14IEBS Industrial Engineering (BS)	Minor	Revisions: Adding/Removing/Archiving Courses
16ETM Ethics Minor	Minor	Revisions: Adding Course to Elective List
17BIOBA Biological Sciences (BA)	Minor	Revisions: Adding Course to Elective List
17BIOSCBS Biological Sciences (and all subplans)	Minor	Revisions: Adding Course to Elective List
17BIOSCMD Biological Sciences (BS): Molecular, Cellular, and Developmental Biology	Minor	Revisions: Removing Course, Changing Biochemistry Requirement
17ZOOBS Zoology (BS)	Minor	Revisions: Adding Course to Elective List
20ECONBA Economics (BA)	Minor	Revisions: Removing course, Adjusting elective list

College of Engineering			
Presenter	Reviewers	Action	Type
Seracino	Pratt-Phillips, Driscoll, Schaffer	MES 300 Systems Engineering	Revisions: SLOs, Offering, Credit Hours, Contact Hours, Instructor, Delivery/DELTA, Catalog Description,
Seracino	Hessling, Pacifi, Hergeth	14CEBS Civil Engineering (BS)	Revisions: Title, Total Hours (up)
Seracino	Duggins, Walsh, Muse	14EGRBS-14EGRMES Engineering (BS): Mechanical Engineering Systems concentration	Revisions: Update Course Number(s), Course Offering/Semester Hours, Change Courses in Curriculum, Total Hours (down)
Reynolds	Harrington, Knowles, Pratt-Phillips	14MSEBS Materials Science & Engineering (BS)	Revisions: Updating Credit Hours, Updating Superscript, Adding/Removing/Changing Courses, GEP Requirements, Updating Electives
Reynolds	Rucker, Rabasco, Pacifi	14MSEBS-14MSEBIO Materials Science & Engineering (BS): Biomaterials	Revisions: Updating Superscripts/Footnotes, Updating Credit Hours, Adding/Removing/Changing Courses, Updating Electives
Reynolds	Janca, Schaffer, Driscoll	14MSEBS-14MSENANO Materials Science & Engineering (BS): Nanomaterials	Revisions: Updating Superscripts/Footnotes, Updating Credit Hours, Adding/Removing/Changing Courses, Updating Electives

College of Humanities and Social Sciences			
Presenter	Reviewers	Action	Type
Knowles	Hergeth, Rabasco, Muse	FL 211 Introduction to the French-Speaking World	New Course

Knowles	Pacifi, Janca, Walsh	PER 101 Elementary Persian I	Revisions: CIP, Instructor, Catalog Description, SLO, Student Evaluation
Driscoll	Muse, Schaffer, Zagacki	PER 103 Elementary Persian I Conversation	New Course

SLO= Student Learning Outcomes

Discussion:

Notes:

- To view actions, please click on the hyperlink. You may need to use your Unity ID to log in.
- If you experience issues logging in, please go to <https://next-catalog.ncsu.edu/courseadmin/> and type the course prefix and number into the search bar.

University Courses and Curricula Committee

March 3, 2021
Hosted Via Zoom
Call to Order: 12:46 PM

Members Present:

Wendy Krause (Chair) Rudi Seracino (Past Chair), Shannon Pratt Philips, Melissa Merrill, James Knowles, Catherine Driscoll, Kristen Schaffer, Peter Hessling, Kanton Reynolds, Peter Janca (in for John Kuzenski), Laura Pacifi (in for Joseph Roise), Spencer Muse, Jonathan Duggins, Renee Harrington, Peggy Domingue, Rob Rucker, Helmut Hergeth, Kenneth Zagacki, Jorden Rabasco, Thomas Walsh

Absent Members:

Guests: Jane Lubischer, Helen Krause, Natalie Cooke, Heather Lyerly, Debbie Acker, Sung-Ju Kim, Meredith Fosque, Daniel Gruehn, April Fogleman

Ex-Officio Members Present: Li Marcus, Lexi Hergeth, John Harrington, Stephany Dunstan,

WELCOME AND INTRODUCTIONS

- **Remarks from Chair –**
- **Remarks from OUCCAS/DASA –** Li Marcus thanked the committee and provided information on how to sign up to serve next year.
- **Approval of the Minutes from 17 February 2021 – Approved**
Discussion: Motion from Jonathan Duggins.

OLD BUSINESS

- **16WCL World Cultural Literacy Minor – Approved**
Discussion: This returning curricular action was presented by James Knowles.

NEW BUSINESS

- **Consent Agenda - Approved**
Discussion: Move to approve from Helmut Hergeth
- **HS 462/562 FS 462/562 Postharvest Physiology– Approved with Suggestion**
Discussion: This course was presented by Melissa Merrill and introduced guest Helen Kraus. Member suggested updating the effective date to fall 2021 instead of fall 2014.
- **NTR 411/511 Public Health Perspectives in Infant Feeding – Approved with Suggestion**
Discussion: This new course was presented by Melissa Merrill and introduced guest April Fogleman. Member asked about a reading in the syllabus, however the syllabus is not under review. Reviewer asked if the student learning outcomes should be suggested to include ranges to apply to all offerings.
- **NTR 412/512 Clinical Concepts in Infant Feeding – Approved with suggestions**
Discussion: This new course was presented by Melissa Merrill. Member asked about the graduate requirements which is not something this undergraduate committee confirms. Same suggestion about ranges as well as to take a look at the graduate level information. Natalie Cooke guest.
- **NTR 413/513 Clinical Concepts in Infant Feeding Laboratory – Approved with Suggestion**
Discussion: This new course was presented by Shannon Pratt Phillips and introduced guest Natalie Cooke and April Fogleman. Member complimented the learning outcomes of this course. Same suggestion to put range the evaluation methods.
- **NTR 440/540 Child and Adolescent Nutrition – Approved with Suggestions**
Discussion: This new course was presented by Shannon Pratt Phillips and introduced guest Natalie Cooke again. Reviewer noticed week 16 has a new topic as well as a final exam and wondered if this should be solely a final exam. Guest indicated this new topic can be moved to week 15 and to provide ranges in the evaluation methods.

- **CE 322 Civil Engineering Materials – Approved**
Discussion: This course was presented by Kanton Reynolds. The hours are correct for a self-contained lab.
- **REL 380 Emotion and Religion – Approved**
Discussion: This new course was presented by Catherine Driscoll.
- **SW 300 Research Methods in Social Work – Approved**
Discussion: This course was presented by Catherine Driscoll. Member asked if the multiple delivery options are future proofing the course, this was confirmed.
- **15FWABMMR-15FWABMMS Accelerated Bachelor's to Master's in Fisheries, Wildlife and Conservation Biology – Approved**
Discussion: This new curricular action was presented by Lara Pacifi. This is the undergraduate portion of the bachelors to master's degree. The committee is reviewing just the undergraduate portion.
- **BIO 269 Research in the Life Sciences II: Guided Research – Approved**
Discussion: This course was presented Spencer Muse. Member asked if the effective date should be updated, the effective date will remain as is.
- **COS 110 Exploring Issues of Diversity, Equity, and Inclusion in the Sciences – Approved**
Discussion: This new course was presented Spencer Muse.
- **FTM 416 The Fashion Industry – Approved Pending**
Discussion: This course was presented Helmut Hergeth. Member asked if the title is appropriate the presenter insured that is acceptable. Members asked if the syllabus should be reviewed by the dean, the course was initiated last semester and technically the syllabus be reviewed by the committee and is up to the committee. Members indicated they would like the college dean step to be added to sign off on the syllabus. Motion to amend the motion to approved pending the dean's signature.
- **FTM 420 Retail Buying in Fashion and Textiles – Approved Pending**
Discussion: This course was presented Helmut Hergeth as approved pending the associate dean to sign off on the syllabus in CIM. Reviewer asked about the "compute open to buy" student learning outcomes, this is a phrase in retail that is allocated for a month indicating the money is available but not spent yet.
- **T 499 Internship in Textiles – Withdrawn**
Discussion: This new course was presented Helmut Hergeth as approved pending the associate dean sign off. Member commented that _99 courses are usually reserved for research, then discussed the internship hours, which is considered a minimum number of contact hours according to the presenter. These numerical guidelines are not enforceable, but a suggestion can be made to follow the guidelines. Member asked if the justification should indicate that this is a way to receive academic credit and to not pay tuition. There is a tricky area having an unpaid internship, receiving college credit, and paying tuition. Presenter indicated the additional information about the number of credit hours in the justification is not necessary.
493 is an internship course that already exists, presenter indicated this course will eventually be dropped, this 499 course is specifically for students with unpaid internship, the 493 course has had little to no enrollment. Members asked why the 493 record wasn't changed instead of creating a new course. The scheduling would be a reason to adjust the old course.
Presenter indicated they could withdraw the course to discuss further within their college.

Discussion:

Meeting adjourned: 1:46 PM.

Respectfully submitted by Lexi Hergeth

MEMORANDUM

Date: February 9, 2021

To: Dr. Bret Smith, Interim Dean for Division of Academic and Student Affairs

From: Dr. Rudi Seracino, Associate Head for Undergraduate Programs, Department of Civil, Construction, and Environmental Engineering

Re: Curriculum Action for BS Construction Engineering (**14CONBS**)

Proposed Revisions:

The proposed changes to the **14CONBS** curriculum are required to accommodate the approved major course action to **CE 332: Civil Engineering Materials**. Revisions to CE 332 that affect this curriculum include the title change and increase in credit hours from 3 to 4. CE 332 is a required course in the Spring Semester of Junior Year. As the current 14CONBS curriculum is already at the limit of 128 credit hours, additional changes are required as described in the following.

1. Update CE 332 course title and credit hours.
2. Move **CE 426: Structural Steel Design** (Fall Semester of Senior Year) to the **Engineering Elective** group.
3. Update approved elective courses in the Engineering Elective group.
4. Move the **Basic Science Elective** group from the Junior Year to the Senior Year.

Proposed Changes in Format A and B displays:

The attached 'marked-up' Format A and B displays identify all the proposed deletions with bold red color and strikethrough font, and all additions in bold blue color font.

Justification for Changes:

1. CE 332 is required course in the 14CONBS degree audit that meets ABET accreditation minimum requirements. The revisions made are consistent with the approved CE332 course action.
2. The increase in CE 332 credit hours from 3 to 4 would exceed the maximum allowable credit hours for a 4 year engineering degree (128 credit hours). To free up credit hours in the curriculum to accommodate the CE 332 course revision, CE 426 is moved to the Engineering Elective group.
3. The Engineering Elective group list of approved courses is updated by adding CE 426, and removing **ECE 331: Principles of Electrical Engineering**, and **MAE 201: Engineering Thermodynamics I**. ECE 331 and MAE 201 cover topics that are no longer included in the fundamentals exam (FE), the first step required to achieve professional licensure, and were originally required in the Mechanical sub-plan of 14CONBS, which has previously been discontinued due to low enrollment. As this elective group now only includes CE courses, it is moved (in Format B) from the list of "**Other Major**" courses, to the list of "**CE Major**" courses.
4. To balance credit hours between semesters, the Basic Science Elective group is moved from the Fall Semester of Junior Year to the Fall Semester of Senior Year.

With these revisions, the minimum credit hours required for graduation is reduced from 128 to 126, which is within limits of 120 – 128 for this engineering degree.

Consultation with other Departments:

Cheryl Tran (MAE) and James Tuck (ECE), departmental representatives on the College of Engineering Courses and Curricula Committee, have been notified of the proposal to drop MAE 201 and ECE 331 from the Engineering Elective group in the 14CONBS curriculum.

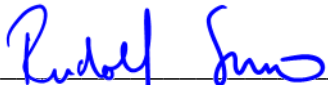
Impact on Other Departments or Programs:

The only revision that affects other departments is the removal of ECE 331 and MAE 201 from the Engineering elective group. The impact is negligible as both of these service courses in the College of Engineering have total enrollment in excess of 200 students per semester. At most, only 20 of the enrolled students would be from the 14CONBS curriculum.

Proposed Effective Date for Revision:

August, 2021

ENDORSED BY:


Associate Head, Department of Civil, Construction,
and Environmental Engineering

02/09/2021
Date

RECOMMENDED BY:


Chair, College Curriculum Committee

02/24/21

Date

ENDORSED BY:


Dean, College of Engineering

02/26/2021

Date

RECOMMENDED BY:

Chair, University Courses & Curricula Committee

Date

APPROVED BY:

Dean, Division of Academic and Student Affairs

Date

EFFECTIVE DATE:

FORMAT A – MARKED-UP Version
(SEMESTER-BY-SEMESTER CURRICULUM DISPLAY)

Indicate display status: Current: Proposed: **X**

Proposed Effective Semester: **Fall 2021**

Degree/Plan Title: **Bachelor of Science in Construction Engineering**

Concentration/Subplan Title:

Plan SIS Code: **14CONBS**

Subplan SIS Code:

New Degree Audit required? (Y or N) **Yes**

Critical Path Courses - Identify using the code (CP) which courses are considered critical path courses which represent specific major requirements that are predictive of student success in a given program/plan. Place the (CP) next to the credit hours for the course.

FRESHMAN YEAR

FALL SEMESTER	CREDITS	SPRING SEMESTER	CREDITS
CH 101 Chemistry, A Molecular Science	3	EC 205 Economics (GEP Req) ¹	3
CH 102 General Chemistry Laboratory	1	MA 241 Calculus II	4
E 101 Introduction to Engr & Prob. Solving	1	PY 205 Physics for Engineers & Scientists I	3
E 115 Intro to Computing Environments	1	PY 206 Physics for Engineers & Scientists I Lab	1
ENG 101 Academic Writing and Research	4	E 102 Engineering in the 21 st Century (GEP Req) ¹	2
MA 141 Calculus I	4	GEP Requirement ¹	3
HESF 1XX Fitness & Wellness Course	1		
<i>Total: 15</i>		<i>Total: 16</i>	

SOPHOMORE YEAR

FALL SEMESTER	CREDITS	SPRING SEMESTER	CREDITS
CSC 111 Intro. to Computing: Python	3	PY 208 Physics for Engineers & Scientists II	3
CE 214 Engineering Mechanics – Statics	3 (CP)	PY 209 Physics for Engineers & Scientists II Lab	1
TDE 220 Civil Engineering Graphics	3	CE 225 Mechanics of Solids	3 (CP)
MA 242 Calculus III	4	ST 370 Probability and Statistics for Engrs.	3
CE 250 Introduction to Sustainable Infrastructure	3 (CP)	CE 365 Construction Equipment & Methods (S)	3
		CE 263 Intro to Construction Engineering (S)	3 (CP)
		HES *** Phys. Ed/Healthy Living Course	1
<i>Total: 16</i>		<i>Total: 17</i>	

JUNIOR YEAR

FALL SEMESTER	CREDITS	SPRING SEMESTER	CREDITS
MSE 200 Mech. Prop. of Structural Materials	3	CE 332 Civil Engineering Materials of	3 4
CE 301 Civil Engr. Surveying & Geomatics	3	Construction	
CE 327 Reinforced Concrete design	3	CE 342 Engineering Behavior of Soils & Fdns.	4
CE 282 Hydraulics	3	CE 367 Mech. and Elect. Systems in Buildings (S)	3
CE 463 Const. Est., Planning & Control (F)	3	MEA 101 Geology I: Physical	3
Basic Science Elective³	3	GEP Requirement ¹	3
<i>Total: 1815</i>		<i>Total: 1617</i>	

SENIOR YEAR

FALL SEMESTER	CREDITS	SPRING SEMESTER	CREDITS
CE 426 Structural Steel Design	3	CE 464 Legal Aspects of Contracting (S)	3
CE 466 Building Construction Engr. (F)	3	CE 469 Construction Eng. Project (S)	3
Engineering Elective ⁴	3	Management Science Elective (GEP Req) ^{1,2}	3
ACC 280 Survey of Financial and Managerial Acc.	3	GEP Requirement ¹	3
COM 110 Public Speaking OR		GEP Requirement ¹	3
ENG 331 Communication for Engr. & Tech.	3		
Basic Science Elective³	3		
<i>Total: 15</i>		<i>Total: 15</i>	

Minimum Credit Hours Required for Graduation*: ~~128~~126

Major/Program Footnotes:

¹GEP Requirements to be selected from the appropriate lists in consultation with the advisor.

² Management Science Elective (2nd Soc Sci GEP) - Select one: SOC 205, SOC 301, SOC 305/AFS 305 (USD), PS 202, PS 310, PS 312, PS 314, or PS 320.

³ Basic Science Elective - Select one: SSC 200, FOR 260, or FW 221

⁴ Engineering Elective – Select one: ~~ECE 331, MAE 201~~, CE 426, CE 499, or an advised elective from CE course list

*Foreign Language Proficiency at the FL_102 level is required for graduation.

***General Education Program (GEP) requirements and GEP Footnotes:**

To complete the requirements for graduation and the General Education Program, the following category credit hours and co-requisites must be satisfied.

University approved GEP course lists for each of the following categories can be found at <http://www.ncsu.edu/uap/academic-standards/gep/courselists/index.html>.

- A. **Mathematical Sciences** (6 credit hours – one course with MA or ST prefix)
Fulfilled as part of Major requirements.
- B. **Natural Sciences** (7 credit hours – include one laboratory course or course with a lab)
Fulfilled as part of Major requirements.
- C. **Humanities** (6 credit hours selected from two different disciplines/course prefixes)
Choose from the University approved GEP Humanities course list.
- D. **Social Sciences** (6 credit hours selected from two different disciplines/course prefixes)
EC 205 (or EC 201 or ARE 201) taken as part of the Major requirements, satisfies 3 credit hours needed to fulfill the GEP Social Sciences requirement.
Course selected from the approved Management Science Elective list as part of the Major requirements satisfies 3 credit hours needed to fulfill the GEP Social Sciences requirement.
- E. **Physical Education/Healthy Living** (2 credit hours – at least one 100-level Fitness and Wellness Course)
Choose from the University approved GEP Physical Education/Healthy Living course list.
- F. **Additional Breadth** - (3 credit hours to be selected from the following checked University approved GEP course lists)
☒ Humanities/Social Sciences/Visual and Performing Arts or _____ Mathematical Sciences/Natural Sciences/Engineering
- G. **Interdisciplinary Perspectives** (5 credit hours)
E 102 taken as part of the Major requirements satisfies 2 credit hours needed to fulfill the GEP Interdisciplinary perspectives requirement.
Choose 3 credit hours from the University approved GEP Interdisciplinary Perspectives course list.
- H. **Introduction to Writing** (4 credit hours satisfied by completing ENG 101 with a C- or better)

The following **Co-Requisites** must be satisfied to complete the General Education Program requirements:

- I. **U.S. Diversity** (USD)
Choose from the University approved GEP U.S. Diversity course list.
- J. **Global Knowledge** (GK)
Choose from the University approved GEP Global Knowledge course list.
- K. **Foreign Language proficiency** - Proficiency at the FL_102 level is required for graduation.

FORMAT A
(SEMESTER-BY-SEMESTER CURRICULUM DISPLAY)

Indicate display status: Current: Proposed: **X**

Proposed Effective Semester: **Fall 2021**

Degree/Plan Title: **Bachelor of Science in Construction Engineering**

Concentration/Subplan Title:

Plan SIS Code: **14CONBS**

Subplan SIS Code:

New Degree Audit required? (Y or N) **Yes**

Critical Path Courses - Identify using the code (CP) which courses are considered critical path courses which represent specific major requirements that are predictive of student success in a given program/plan. Place the (CP) next to the credit hours for the course.

FRESHMAN YEAR

FALL SEMESTER	CREDITS	SPRING SEMESTER	CREDITS
CH 101 Chemistry, A Molecular Science	3	EC 205 Economics (GEP Req) ¹	3
CH 102 General Chemistry Laboratory	1	MA 241 Calculus II	4
E 101 Introduction to Engr & Prob. Solving	1	PY 205 Physics for Engineers & Scientists I	3
E 115 Intro to Computing Environments	1	PY 206 Physics for Engineers & Scientists I Lab	1
ENG 101 Academic Writing and Research	4	E 102 Engineering in the 21 st Century (GEP Req) ¹	2
MA 141 Calculus I	4	GEP Requirement ¹	3
HESF 1XX Fitness & Wellness Course	1		
<i>Total: 15</i>		<i>Total: 16</i>	

SOPHOMORE YEAR

FALL SEMESTER	CREDITS	SPRING SEMESTER	CREDITS
CE 214 Engineering Mechanics – Statics	3 (CP)	CE 225 Mechanics of Solids	3 (CP)
CE 250 Introduction to Sustainable Infrastructure	3 (CP)	CE 263 Intro to Construction Engineering (S)	3 (CP)
CSC 111 Intro to Computing: Python	3	CE 365 Construction Equipment & Methods (S)	3
TDE 220 Civil Engineering Graphics	3	PY 208 Physics for Engineers & Scientists II	3
MA 242 Calculus III	4	PY 209 Physics for Engineers & Scientists II Lab	1
		ST 370 Probability and Statistics for Engrs.	3
		HES *** Phys. Ed/Healthy Living Course	1
<i>Total: 16</i>		<i>Total: 17</i>	

JUNIOR YEAR

FALL SEMESTER	CREDITS	SPRING SEMESTER	CREDITS
CE 282 Hydraulics	3	CE 332 Materials of Construction	4
CE 301 Civil Engr. Surveying & Geomatics	3	CE 342 Engineering Behavior of Soils & Fdns.	4
CE 327 Reinforced Concrete design	3	CE 367 Mech. and Elect. Systems in Buildings (S)	3
CE 463 Const. Est., Planning & Control (F)	3	MEA 101 Geology I: Physical	3
MSE 200 Mech. Prop. of Structural Materials	3	GEP Requirement ¹	3
<i>Total: 15</i>		<i>Total: 17</i>	

SENIOR YEAR

FALL SEMESTER	CREDITS	SPRING SEMESTER	CREDITS
CE 466 Building Construction Engr. (F)	3	CE 464 Legal Aspects of Contracting (S)	3
Engineering Elective ⁴	3	CE 469 Construction Eng. Project (S)	3
ACC 280 Survey of Financial and Managerial Acc.	3	Management Science Elective (GEP Req) ^{1,2}	3
COM 110 Public Speaking OR		GEP Requirement ¹	3
ENG 331 Communication for Engr. & Tech.	3	GEP Requirement ¹	3
Basic Science Elective ³	3		
<i>Total: 15</i>		<i>Total: 15</i>	

Minimum Credit Hours Required for Graduation*: 126

Major/Program Footnotes:

¹GEP Requirements to be selected from the appropriate lists in consultation with the advisor.

² Management Science Elective (2nd Soc Sci GEP) - Select one: SOC 205, SOC 301, SOC 305/AFS 305 (USD), PS 202, PS 310, PS 312, PS 314, or PS 320.

³ Basic Science Elective - Select one: SSC 200, FOR 260, or FW 221

⁴ Engineering Elective – Select one: CE 426, CE 499, or an advised elective from CE course list

*Foreign Language Proficiency at the FL_102 level is required for graduation.

***General Education Program (GEP) requirements and GEP Footnotes:**

To complete the requirements for graduation and the General Education Program, the following category credit hours and co-requisites must be satisfied.

University approved GEP course lists for each of the following categories can be found at <http://www.ncsu.edu/uap/academic-standards/gep/courselists/index.html>.

- A. **Mathematical Sciences** (6 credit hours – one course with MA or ST prefix)
Fulfilled as part of Major requirements.
- B. **Natural Sciences** (7 credit hours – include one laboratory course or course with a lab)
Fulfilled as part of Major requirements.
- C. **Humanities** (6 credit hours selected from two different disciplines/course prefixes)
Choose from the University approved GEP Humanities course list.
- D. **Social Sciences** (6 credit hours selected from two different disciplines/course prefixes)
EC 205 (or EC 201 or ARE 201) taken as part of the Major requirements, satisfies 3 credit hours needed to fulfill the GEP Social Sciences requirement.
Course selected from the approved Management Science Elective list as part of the Major requirements satisfies 3 credit hours needed to fulfill the GEP Social Sciences requirement.
- E. **Physical Education/Healthy Living** (2 credit hours – at least one 100-level Fitness and Wellness Course)
Choose from the University approved GEP Physical Education/Healthy Living course list.
- F. **Additional Breadth** - (3 credit hours to be selected from the following checked University approved GEP course lists)
☒ Humanities/Social Sciences/Visual and Performing Arts or _____ Mathematical Sciences/Natural Sciences/Engineering
- G. **Interdisciplinary Perspectives** (5 credit hours)
E 102 taken as part of the Major requirements satisfies 2 credit hours needed to fulfill the GEP Interdisciplinary perspectives requirement.
Choose 3 credit hours from the University approved GEP Interdisciplinary Perspectives course list.
- H. **Introduction to Writing** (4 credit hours satisfied by completing ENG 101 with a C- or better)

The following **Co-Requisites** must be satisfied to complete the General Education Program requirements:

- I. **U.S. Diversity** (USD)
Choose from the University approved GEP U.S. Diversity course list.
- J. **Global Knowledge** (GK)
Choose from the University approved GEP Global Knowledge course list.
- K. **Foreign Language proficiency** - Proficiency at the FL_102 level is required for graduation.

CURRICULUM REQUIREMENTS

Format B

Degree/Plan Title: Bachelor of Science in Construction Engineering		Plan SIS Code: 14CONBS
Concentration/Subplan Title:		Subplan SIS Code:
Indicate requirements status: Current:	Proposed: X	Proposed Effective Semester: Fall 20192021
New Degree Audit required? (Y or N) Yes		
Critical Path Courses - Identify using the code (CP) which courses are considered critical path courses which represent specific major requirements that are predictive of student success in a given program/plan. Place the (CP) next to the credit hours for the course.		

MAJOR FIELD OF STUDY REQUIREMENTS:		
<i>Required Courses/Groups/ Electives:</i>	<i>Credit Hours</i>	<i>GEP category, if applicable</i>
Indicate if course or course groupings have a C-wall or MGPA requirement and which are considered Critical Path courses – indicate with (CP) next to applic. course.		List GEP category and hours satisfied by a Major requirement
Math MA 141, MA 241, MA 242	12	Mathematics (6 hours)
Sciences CH 101, CH 102 PY 205, PY 206, PY 208, PY 209	4 8	Natural Sciences (4 hours) Natural Sciences (3 hours)
CE Major CE 214 (C-wall) CE 225 (C-wall) CE 250 CE 263 CE 282 (C-wall) CE 301 CE 327 CE 332 CE 342 CE 365 CE 367 CE 426 CE 463 CE 464 CE 466 CE 469 <u>GRP xxx Engineering Elective (CE 426, CE 499 or an advised elective from the CE course list)</u>	3 (CP) 3 (CP) 3 (CP) 3 (CP) 3 3 3 34 4 3 3 3 3 3 3 3 <u>3</u>	
Other Major CSC 111 MEA 101 ACC 280 TDE 220 MSE 200 ST 370 GRP xxx (COM 110 or ENG 331) GRP xxx Engineering Elective (ECE 331, MAE 201, CE 499 or an advised elective from the CE course list) GRP xxx Basic Science Elective (SSC 200, FOR 260 or FW 221) GRP xxx Management Science Elective (SOC 205, SOC 301, SOC 305, AFS 305, PS 202, PS 310, PS 312, PS 314 or PS 320)	3 3 3 3 3 3 3 3 3 3 3	Social Science (3 hours)

Concentration Courses/Groups/Electives:		
Free Electives:		
Total credit hours under Major Field of Study: <i>Minimum 27 hours required in program area.</i>	103-101 hours	
COLLEGE REQUIREMENTS:		
Orientation Course(s): E 101 and E 115	2	
Other: Economics Elective EC 205 (or EC 201 or ARE 201) E 102	3 2	Social Science (3 hours) Interdisciplinary Perspectives (2 hours)
Total credit hours under College Requirements:	7 hours	

<u>NCSU GENERAL EDUCATION PROGRAM REQUIREMENTS</u> <i>Courses in the Major and/or Minor may also fulfill a General Education requirement; however, a GEP category may not be subset to require a specific course from the category list. Required courses must be listed in the Major/College requirements.</i> <i>Specific courses should not be listed in any of the fields below other than ENG 101.</i>		<u>At least one of the following must be listed:</u> 1 Choose course(s) from the University Approved GEP course list for this category. 2 Minimum requirements are satisfied by Major/College course requirements. 3 Major/College course requirement satisfies X credit hrs of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category. 4 Co-requisite is satisfied by a Major/College course requirement. 5 Choose course(s) from the University Approved GEP course lists for the Humanities/ Social Sciences/ Visual & Performing Arts. 6 Choose course(s) from the University Approved GEP course lists for Natural Sciences/Mathematical Sciences.
General Education Program Requirements: <i>Minimum 39-40 hrs</i>	Credit hours	How will the GEP requirement be met? (Choose applicable statement from 1-6 listed above)
Mathematical Sciences (6 credits) (At least 1 course with MA or ST prefix) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	X	(Choose statement 1, 2 or 3) Minimum requirements are satisfied by Major/College course requirements.
Natural Sciences (7 credits) (At least 1 lab course or course with a lab) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	X	(Choose statement 1, 2 or 3) Minimum requirements are satisfied by Major/College course requirements.
English 101 (C- or better required) (4 credits)	4	ENG 101
Humanities (6 credits) (Courses from two different disciplines) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	6	(Choose statement 1, 2 or 3) Choose course(s) from the University Approved GEP course list for this category.
Social Sciences (6 credits) (Courses from two different disciplines) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	X	(Choose statement 1, 2 or 3) Minimum requirements are satisfied by Major/College course requirements.
Additional Breadth (3 credits) (Choose approach that is different from the approach of the Major) Major/College requirements cannot satisfy this requirement and an AB course cannot be double-counted except in satisfying the Global Knowledge or U.S. Diversity co-requisites.	3	(Choose statement 5 or 6) Choose course(s) from the University Approved GEP course list for this category.
Interdisciplinary Perspectives (5 credits) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	3	(Choose statement 1, 2 or 3) Major/College course requirement satisfies 2 credit hrs of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category.
Health and Exercise Studies (2 credits) (Including one Fitness and Wellness course)	2	Choose course(s) from the University Approved GEP course list for this category.
Total credit hours needed to complete GEP that are not satisfied as part of the Major/College requirements.	18 hours	

GEP Co-Requisites:			<i>Courses taken in the Major, GEP, or Minor may double-count to fulfill the co-requisites. Courses that satisfy the U.S. Diversity or Global Knowledge co-requisite are marked on course lists with a "USD" or "GK" indicator.</i>
U.S. Diversity co-requisite	(USD)	n/a	<i>(Choose statement 1 or 4)</i>
Global Knowledge co-requisite	(GK)	n/a	<i>(Choose statement 1 or 4)</i>
Foreign Language Proficiency		n/a	Proficiency at the FL_102 level required.
The following requirements must be satisfied within the College/Program:			Place an X in the credit hour box to indicate below that the requirement is "Satisfied by College/Program Requirements"
Communication in the Major (Advanced Communication)		n/a	Satisfied by College/Program Requirements
Technology Fluency		n/a	Satisfied by College/Program Requirements
Total credit hours required to complete Degree: Total must be within 120-128 credit hours.		128 <u>126</u> Total hours	As applicable, indicate here the overall GPA requirement for degree completion including course completion.

CURRICULUM REQUIREMENTS

Format B

<u>Degree/Plan Title:</u> Bachelor of Science in Construction Engineering		<u>Plan SIS Code:</u> 14CONBS
<u>Concentration/Subplan Title:</u>		<u>Subplan SIS Code:</u>
<u>Indicate requirements status:</u> Current:	Proposed: X	<u>Proposed</u> Effective Semester: Fall 2021
<u>New Degree Audit required?</u> (Y or N) Yes		
<u>Critical Path Courses</u> - Identify using the code (CP) which courses are considered critical path courses which represent specific major requirements that are predictive of student success in a given program/plan. Place the (CP) next to the credit hours for the course.		

MAJOR FIELD OF STUDY REQUIREMENTS:		
<i>Required Courses/Groups/ Electives:</i>	<i>Credit Hours</i>	<i>GEP category, if applicable</i>
Indicate if course or course groupings have a C-wall or MGPA requirement and which are considered Critical Path courses – indicate with (CP) next to applic. course.		List GEP category and hours satisfied by a Major requirement
<u>Math</u> MA 141, MA 241, MA 242	12	Mathematics (6 hours)
<u>Sciences</u> CH 101, CH 102 PY 205, PY 206, PY 208, PY 209	4 8	Natural Sciences (4 hours) Natural Sciences (3 hours)
<u>CE Major</u> CE 214 (C-wall) CE 225 (C-wall) CE 250 CE 263 CE 282 (C-wall) CE 301 CE 327 CE 332 CE 342 CE 365 CE 367 CE 463 CE 464 CE 466 CE 469 GRP xxx Engineering Elective (CE 426, CE 499 or an advised elective from the CE course list)	3 (CP) 3 (CP) 3 (CP) 3 (CP) 3 3 3 4 4 3 3 3 3 3 3	
<u>Other Major</u> CSC 111 MEA 101 ACC 280 TDE 220 MSE 200 ST 370 GRP xxx (COM 110 or ENG 331) GRP xxx Basic Science Elective (SSC 200, FOR 260 or FW 221) GRP xxx Management Science Elective (SOC 205, SOC 301, SOC 305, AFS 305, PS 202, PS 310, PS 312, PS 314 or PS 320)	3 3	Social Science (3 hours)

Concentration Courses/Groups/Electives:		
Free Electives:		
Total credit hours under Major Field of Study: <i>Minimum 27 hours required in program area.</i>	101 hours	
COLLEGE REQUIREMENTS:		
Orientation Course(s): E 101 and E 115	2	
Other: Economics Elective EC 205 (or EC 201 or ARE 201) E 102	3 2	Social Science (3 hours) Interdisciplinary Perspectives (2 hours)
Total credit hours under College Requirements:	7 hours	

<u>NCSU GENERAL EDUCATION PROGRAM REQUIREMENTS</u> <i>Courses in the Major and/or Minor may also fulfill a General Education requirement; however, a GEP category may not be subset to require a specific course from the category list. Required courses must be listed in the Major/College requirements.</i> <i>Specific courses should not be listed in any of the fields below other than ENG 101.</i>		<u>At least one of the following must be listed:</u> 1 Choose course(s) from the University Approved GEP course list for this category. 2 Minimum requirements are satisfied by Major/College course requirements. 3 Major/College course requirement satisfies X credit hrs of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category. 4 Co-requisite is satisfied by a Major/College course requirement. 5 Choose course(s) from the University Approved GEP course lists for the Humanities/ Social Sciences/ Visual & Performing Arts. 6 Choose course(s) from the University Approved GEP course lists for Natural Sciences/Mathematical Sciences.
General Education Program Requirements: <i>Minimum 39-40 hrs</i>	Credit hours	How will the GEP requirement be met? (Choose applicable statement from 1-6 listed above)
Mathematical Sciences (6 credits) (At least 1 course with MA or ST prefix) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	X	(Choose statement 1, 2 or 3) Minimum requirements are satisfied by Major/College course requirements.
Natural Sciences (7 credits) (At least 1 lab course or course with a lab) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	X	(Choose statement 1, 2 or 3) Minimum requirements are satisfied by Major/College course requirements.
English 101 (C- or better required) (4 credits)	4	ENG 101
Humanities (6 credits) (Courses from two different disciplines) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	6	(Choose statement 1, 2 or 3) Choose course(s) from the University Approved GEP course list for this category.
Social Sciences (6 credits) (Courses from two different disciplines) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	X	(Choose statement 1, 2 or 3) Minimum requirements are satisfied by Major/College course requirements.
Additional Breadth (3 credits) (Choose approach that is different from the approach of the Major) Major/College requirements cannot satisfy this requirement and an AB course cannot be double-counted except in satisfying the Global Knowledge or U.S. Diversity co-requisites.	3	(Choose statement 5 or 6) Choose course(s) from the University Approved GEP course list for this category.
Interdisciplinary Perspectives (5 credits) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	3	(Choose statement 1, 2 or 3) Major/College course requirement satisfies 2 credit hrs of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category.
Health and Exercise Studies (2 credits) (Including one Fitness and Wellness course)	2	Choose course(s) from the University Approved GEP course list for this category.
Total credit hours needed to complete GEP that are <u>not</u> satisfied as part of the Major/College requirements.	18 hours	

GEP Co-Requisites:			<i>Courses taken in the Major, GEP, or Minor may double-count to fulfill the co-requisites. Courses that satisfy the U.S. Diversity or Global Knowledge co-requisite are marked on course lists with a "USD" or "GK" indicator.</i>
U.S. Diversity co-requisite	(USD)	n/a	<i>(Choose statement 1 or 4)</i>
Global Knowledge co-requisite	(GK)	n/a	<i>(Choose statement 1 or 4)</i>
Foreign Language Proficiency		n/a	Proficiency at the FL_102 level required.
The following requirements must be satisfied within the College/Program:			Place an X in the credit hour box to indicate below that the requirement is "Satisfied by College/Program Requirements"
Communication in the Major (Advanced Communication)		n/a	Satisfied by College/Program Requirements
Technology Fluency		n/a	Satisfied by College/Program Requirements
Total credit hours required to complete Degree: Total must be within 120-128 credit hours.		126 Total hours	As applicable, indicate here the overall GPA requirement for degree completion including course completion.

Curriculum Action Memorandum

To: University Courses and Curriculum Committee

From: Edward P. Fitts Department of Industrial & Systems Engineering
College of Engineering

Date: February 15, 2021

Affected Plans:

Bachelor of Science in Industrial Engineering (14IEBS)

Revisions:

Update to Curriculum Plan for 14IEBS

The Edward P. Fitts Department of Industrial & Systems Engineering has modified their list of technical electives to prevent from manual updates in the degree audit to be compliant with financial aid requirements. In addition, the Department has introduced a number of elective courses with in the last two academic years, which are not included in the Student Information System table of acceptable classes for Technical Elective credit.

1. *Remove MSE 445/545 – Ceramic Processing*
2. *Remove MSE 485 – Biomaterials*
3. Add ID 240 – Human Centered Design
4. Add ISE 411 – Supply Chain Economics and Decision Making
5. Add ISE 413 – Humanitarian Logistics
6. Add ISE 425 – Medical Decision Making
7. Add ISE 433 – Service Systems Engineering
8. Add ISE 435 – Python Programming for ISE
9. Add ISE 437 – Data Analytics for Industrial Engineering
10. Add ISE 447 – Applications of Data Science in Healthcare
11. Add PSY 340 – Ergonomics
12. Add PSY 400 – Perception
13. Add PSY 420 – Cognitive Processes
14. Add BEC 475 – Global Regulatory Affairs for Medical Products
15. Add ST 380 – Probability and Statistics for the Physical Sciences
16. Add E 304 – Introduction to Nano Science and Technology
17. Add PSE 476 – Environmental Life Cycle Analysis
18. Add ST 380 – Probability and Statistics for the Physical Sciences
19. Add TE 301 – Engineering Textile Structures I
20. Add TE 302 – Textile Manufacturing Processes and Systems II
21. Add TE 565 – Textile Composites
22. Add ISE 519 – Database Applications in Industrial & Systems Engineering

23. Add ISE 540 – Human actors in Systems Design
24. Add ISE 541 – Occupational Safety Engineering
25. Add ISE 544 – Occupational Biomechanics
26. Add ISE 552 – Design & Control of Production & Service Systems
27. Add ISE 553 – Modeling and Analysis of Supply Chains
28. Add ISE 520 – Healthcare Systems Performance Improvement I
29. Add ISE 489 - Special Topics in Industrial Engineering
30. Add ECE 482 – Engineering Entrepreneurship and New Product Development I
31. *Archive ISE 462 - THERE ARE NO PLANS TO OFFER ISE 462 – Advanced Stochastic Models in IE in the foreseeable future.*

Justification:

Edward P. Fitts Department of Industrial & Systems Engineering will reduce staff workload and student uncertainty by modifying the most commonly enrolled technical electives, which comprise 9 hours of the 127-hour ISE curriculum.

Impact to the programs:

There is no impact to other departments. All courses are currently available to ISE students; this formalizes the process due to changes in financial aid requirements.

Proposed effective date for revision:

Spring 2021 - 2211

Industrial Engineering (BS) (14IEBS)

Freshman Year

Fall Semester	Credit	Spring Semester	Credit
CH 101Chemistry, A Molecular Science	3	EC 205 Economics ¹ (or EC 201 or ARE 201)	3
CH 102 General Chemistry Lab	1	MA 241 Calculus II	4
E 101 Introduction to Engr & Prob Solv	1	PY 205 Physics for Engr & Sc I	3
E 115 Intro to Computing Environ	1	E 102 Engineering in the 21st Century (GEP-IP)	2
ENG 101 Academic Writing and Research	4	HES_*** Health & Exercise Studies Course*	1
MA 141 Calculus I	4	GEP Requirement*	3
HES_*** Health & Exercise Studies Course*	1		
	15		16

Sophomore Year

Fall Semester	Credit	Spring Semester	Credit
MSE 200 Mechanical Properties of Structural Materials	3	ECE 331 Prin of Elect Engr	3
ISE 135 Comp Model for Engrs	3	ISE 215 Product Specification	1
MA 242 Calculus III	4	ISE 216 Mfg Engr Practicum	3
PY 208 Physics for Engineers & Scientists II	3	MA 303 Linear Analysis ²	3
PY 209 Physics for Engineers & Scientists II Lab	1	ST 372 Intro Stat Infer & Regres	3
ST 371 Intro Prob & Dist Theory	3	GEP Requirement*	3
	17		16

Junior Year

Fall Semester	Credit	Spring Semester	Credit
ISE 311 Engr Econ Analysis	3	ISE 352 Fundamentals of Human-Machine Systems Design	3
ISE 316 Mfg Engr I – Processes	3	ISE 362 Stochastic Models in IE	3 (CP)
ISE 315 Computer-aided Mfg	1	ISE 443 Quality Control	3
CE 214 Engineering Mechanics - Statics ³	3	Technical Elective	3
ISE 361 Deter Models in IE	3 (CP)	Engineering Science Elective ⁴	3
Ethics (GEP Req*)	3		
	16		15

Senior Year

Fall Semester	Credit	Spring Semester	Credit
ISE 441 Intro to Simulation	3 (CP)	ISE 498 Sr Design Proj or ISE 521 Healthcare Sys Performance Improv II	3 (CP)
ISE 398 Lean Six Sigma for IE	1	Technical Elective	3
ISE 408 Design and Control of Production & Service Systems	3 (CP)	GEP Requirement*	3
ISE 520 Healthcare Systems Performance Improvement I or Technical Elective	3	GEP Requirement*	3
ISE 453 Modeling and Analysis of Supply Chains	3 (CP)	GEP Requirement*	2-3
ENG 331 Technical Writing	3		
	16		14-15

Minimum Credit Hours Required for Graduation:

127

Major/Program requirements and footnotes

1 Economics: EC 205, EC 201, or ARE 201

2 Mathematics: MA 303 or MA 341

3 Statistics: CE 214 or MAE 206

4 Engineering science electives: CE 225, CE 282, MAE 201, MAE 208, MAE 214, MAE 308, or MSE 355.

5 Technical Electives: BEC 475, E 304, ECE 482, ID 240, ISE 411, ISE 413, ISE 416, ISE 417, ISE 425,

ISE 433, ISE 435, ISE 437, ISE 447, ISE 452, ISE 495, ISE 519, ISE 520, ISE 540, ISE 541, ISE 544, ISE

552, ISE 553, MSE 465/565, PSE 476, PSY 340, PSY 400, PSY 420, ST 380, ST 430, ST 431, ST 432, TE

301, TE 302, TE 565,

*General Education Program (GEP) requirements

*To complete the requirements for graduation and the General Education Program, the following credit hours and co-requisites must be satisfied. University approved GEP course lists for each category can be found at <http://oucc.dasa.ncsu.edu/general-education-program/>.

Health & Exercise Studies - 2 hours to be selected from the approved GEP Health & Exercise Studies list.

a. One fitness and wellness course (any Health & Exercise Studies 100-level course).

b. One additional credit hour of Health & Exercise Studies activity courses.

Humanities - 6 credits to be selected in two different disciplines (two different course prefixes) from the approved GEP Humanities list.

Social Sciences - 3 credits to be selected in a discipline other than economics from the approved GEP Social Sciences list. EC 205 taken as part of the Major requirements satisfies 3 credit hours of the 6 credit hours needed to fulfill the GEP Social Sciences requirement.

Additional Breadth - 3 credits to be selected from the approved GEP Humanities, Social Sciences or Visual and Performing Arts lists.

Interdisciplinary Perspectives - 5 credits to be selected from the approved GEP Interdisciplinary Perspectives list. Ethics course taken as part of the Major requirements satisfies 3 credit hours of the 5-6 credit hours needed to fulfill the GEP Interdisciplinary Perspectives requirement.

Co-requisites

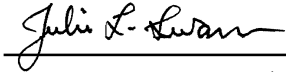
U.S. Diversity and Global Knowledge co-requisites must be satisfied to complete the General Education requirements. Choose course(s) that are identified on the approved GEP course lists as meeting the U.S. Diversity and Global Knowledge co-requisites.

Foreign Language proficiency at the FL_102 level will be required for graduation.

SIGNATURE PAGE

CURRICULUM ACTION FOR 14 IEBS

RECOMMENDED By:



HEAD, DEPARTMENT/ PROGRAM

DATE 2/15/2021

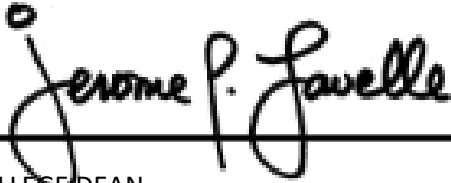
ENDORSED By:



2/24/2021

CHAIR, COLLEGE COURSE & CURRICULA COMMITTEE

DATE



02/26/2021

COLLEGE DEAN

DATE

APPROVED By:

CHAIR, UNIVERSITY COURSES & CURRICULA COMMITTEE

DATE

CHAIR, COUNCIL ON UNDERGRADUATE EDUCATION

DATE

DEAN, DIVISION OF ACADEMIC AND STUDENT AFFAIRS (DASA)

DATE

APPROVED EFFECTIVE DATE _____



TO: University Courses and Curricula Committee (UCCC) **DATE:** February 8, 2021
FROM: Professor Michael J. Pendlebury, Head
SUBJECT: Adding MIE 306 to second electives list for 16ETHM

MIE 306: Managing Ethics in Organizations is wholly appropriate for the second list of elective courses for the **Minor in Ethics 16ETHM** (<https://oucc.dasa.ncsu.edu/ethics-16ethm/>)

Catalog description of MIE 306:

MIE 306: Managing Ethics in Organizations

Units: 3

Management practices to define, communicate, and implement ethical conduct in business organizations. Normative and applied analysis of current ethical dilemmas of corporations in free markets, techniques for effective management of corporate social responsibility, and formulation and implementation of ethics management programs. College of Management majors only.

Prerequisite: MIE 201

Offered in Fall and Spring

and students would benefit from its addition to that list. We therefore propose to add it, as indicated below in red.

Thank you.

Ethics (16ETHM)

Description

Ethical issues arise in every field of human endeavor, so knowledge of ethics is beneficial to students regardless of their major. The Minor in Ethics is designed to expose students in a systematic way to the fundamental theories and concepts of ethics. It is a highly desirable minor because it demonstrates to employers, graduate schools, and professional schools an interest in and knowledge of ethical issues.

In addition to taking a solid core of philosophy courses focusing on ethics, students pursuing the minor may also elect to count towards it one relevant course from another department. This course will be chosen from a list of courses offered by a wide range of other departments including Anthropology, Engineering, Genetics, History, Microbiology, Political Science, and the Science, Technology, & Society Program.

Requirements

- The minor consists of 15 hours of credit (5 courses) including 6 hours of required courses and 9 hours of elective courses.
- A grade of 'C-' or better will be required for all courses taken to fulfill the minor requirements.
- A maximum of TWO (2) courses may be used (double-counted) towards both departmental major requirements and minor requirements.

The department will determine whether courses which have been transferred from other institutions qualify for the minor. No more than two courses from other institutions may count toward the minor.

Required Courses

Six credit hours (two courses) must be selected from the following:

- PHI 375 Ethics (3 cr) **OR** PHI 376 History of Ethics (3 cr) **OR** PHI 475 Ethical Theory (3 cr)

Elective Courses

Select two courses from:

- PHI 214 Issues in Business Ethics (3 cr)
- PHI 221 Contemporary Moral Issues (3 cr)
- PHI 309 Contemporary Political Philosophy (3 cr)
- PHI 313 Ethical Problems in the Law (3 cr)
- PHI (STS) 325 Bio-Medical Ethics (3 cr)
- PHI 375 Ethics (3 cr)
- PHI 376 History of Ethics (3 cr)
- PHI 420 Global Justice (3 cr)
- PHI 422 Philosophical Issues in Environmental Ethics (3 cr)
- PHI 475 Ethical Theory (3 cr)
- REL 473 Religion, Gender, and Reproductive Technologies (3 cr)

Select one additional course from:

The Elective Course list above or from the following:

- ANT 420 Biological Bases for Human Social Behavior (3 cr)
- ENG (WGS) 327 Language and Gender (3 cr)
- GN 301 Genetics in Human Affairs (3 cr)
- HI (AFS) 455 History of the Civil Rights Movement (3 cr)
- **[add] MIE 306 Managing Ethics in Organizations**
- MB 200 Microbiology and World Affairs (3 cr)
- PHI 310 Existentialism (3 cr)
- PHI 312 Philosophy of Law (3 cr)
- PHI 319 African Political Philosophy (3 cr)
- PHI 320 Philosophy of Race (3 cr)
- PHI 347 Neuroscience and Philosophy (3 cr)
- PS 204 Problems of American Democracy (3 cr)
- PS 205 Law and Justice (3 cr)
- PS (WGS) 306 Gender and Politics in the United States (3 cr)
- PS 309 Equality and Justice in United States Law (3 cr)
- PS 361 Introduction to Political Theory (3 cr)
- PS (AFS) 409 Black Political Participation in America (3 cr)
- PS (WGS) 418 Gender, Law, and Policies (3 cr)
- PS 462 Seminar in Political Theory (3 cr)
- SOC (WGS) 304 Women and Men in Society (3 cr)
- SOC (AFS) 305 Racial and Ethnic Relations (3 cr)
- SOC (WGS) 407 Sociology of Sexuality (3 cr)
- SOC 428 Formal Institutions of Social Control (3 cr)
- STS 304 Ethical Dimensions of Progress (3 cr)

Admissions

Students may declare their intention to complete the Ethics minor. Should students wish to transfer courses from other institutions toward the minor, students should consult with Dr. Timothy Hinton, advisor for the minor.

Certification

To be certified as having completed the minor in Ethics, students must have a minimum 2.0 grade point average across all courses used toward the minor. Dr. Hinton will certify the minor prior to graduation. The minor must be completed no later than the semester in which the student expects to graduate from **[his or her] their** degree program. Paperwork for certification should be completed no later than during the registration period for the student's final semester at NC State.

Contact Persons

Dr. Timothy Hinton, Minor Advisor
Department of Philosophy and Religious Studies
Withers Hall 456
919.513.7941

tim_hinton@ncsu.edu

Joanna King, Student Services Associate
Department of Philosophy and Religious Studies
Withers Hall 340
919.515.6100

joanna_king@ncsu.edu

SIS code: 16ETHM

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Courses, Curricula, and Academic Standards

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CURRICULUM REQUIREMENTS

Format B Minor Adapted

Minor Plan Title: Ethics	Plan SIS Code: 16ETHM
Concentration/Subplan Title: n/a	Subplan SIS Code: n/a
Indicate requirements status: Current: Proposed: X	Proposed Effective Semester: 2211
New Minor Audit required? (Y or N) N	
Critical Path Courses - Identify using the code (CP) which courses are considered critical path courses that represent specific major requirements that are predictive of student success in a given program/plan. Place the (CP) next to the credit hours for the course.	

MINOR FIELD OF STUDY REQUIREMENTS:		
Required Courses/Groups/ Electives:	Credit Hours	Notes
<p>Indicate if course or course groupings have a C-wall or MGPA requirement and which are considered Critical Path courses – indicate with (CP) next to applic. course.</p> <p>C- or better required</p> <p>Required Courses</p> <p>Select two from the following</p> <p>Intro Ethics (Requirement: 000033307)</p> <p>PHI 375, 376, 475</p> <p>Elective Courses</p> <p>Restricted Electives (Requirement: 000033308)</p> <p>Select two from the following</p> <p>PHI 214, 221, 309, 313, 325, 375, 376, 420, 475, REL 473, WGS 473</p> <p>Additional Elective (Requirement: 000033309)</p> <p>AFS 304, 409, 455, ENG 327, GN 301, HI 455, MB 200, [add]</p> <p>MIE 306, PHI 214, 221, 309, 310, 312, 313, 319, 325, 375, 376, 420, 475, PS 204, 306, 309, 361, 409, 418, 462, REL 473, SOC 304, 305, 407, 428, STS 304, 325, WGS 304, 306, 327, 407, 418, 473</p>	<p style="text-align: center;">6</p> <p style="text-align: center;">6</p> <p style="text-align: center;">3</p>	
Total credit hours required to complete minor <i>Minimum 15 hours required</i>	15	

NC STATE

Hope Ziglar <hziglar@ncsu.edu>

Re: Fwd: Adding MIE 306 to !6ETHM Minor in Ethics

1 message

Michael Pendlebury <mjpendle@ncsu.edu>
To: Hope Ziglar <hziglar@ncsu.edu>

Wed, Mar 3, 2021 at 9:35 AM

Hope,

I approve this curriculum revision. If you want me to sign the request, just let me know.

I hope all is going well with you.

Best,

Michael

Michael Pendlebury
Professor of Philosophy and Department Head
Philosophy and Religious Studies
North Carolina State University

On 3/2/2021 3:56 PM, Hope Ziglar wrote:

Hello Dr. Pendlebury,

Would you please confirm, via email, your approval of this curriculum revision?

----- Forwarded message -----

From: **David Austin** <david_austin@ncsu.edu>
Date: Mon, Feb 8, 2021 at 9:53 PM
Subject: Adding MIE 306 to !6ETHM Minor in Ethics
To: Hope Ziglar <hziglar@ncsu.edu>

My department proposes to add MIE 306 to the second list of elective courses for !6ETHM Minor in Ethics.
The attached is submitted for that purpose.

Did I get that right?

Thanks.

David.

--

David F. Austin <david_austin@ncsu.edu>
Associate Professor of Philosophy and Associate Head
Department of Philosophy and Religious Studies,
<https://philrel.chass.ncsu.edu/>
Box 8103, 101 Lampe Dr
North Carolina State University
Raleigh, NC 27695-8103
(919) 515-6333
FAX (office): (919) 513-4351
Withers Hall 340B
Chair, H&SS Undergraduate Committee - Course and Curriculum Actions, 2014-2021

"All electronic mail messages in connection with State business which are sent to or received by this account are subject to the NC Public Records Law and may be disclosed to third parties."

SIGNATURE PAGE FOR

Adding MIE 306 to Elective Course List for 16ETHM Ethics Minor

#

RECOMMENDED BY:

Michael J. Pendlebury, HEAD, Philosophy & Religious Studies

DATE

ENDORSED BY:



CHAIR, H&SS COURSES & CURRICULA COMMITTEE

DATE



2-17-21

H&SS DEAN

DATE

APPROVED BY:

DEAN, DIVISION OF ACADEMIC AND STUDENT AFFAIRS (DASA)

DATE

APPROVED EFFECTIVE DATE _____

NC STATE UNIVERSITY

TO: Office of the Dean for Academic and Student Affairs
FROM: Jane Lubischer, Associate Department Head, Biological Sciences
RE: Add BIO 267 to elective lists in 17BIOSCBS, 17ZOOBS and 17BIOBA
DATE: 13 February 2021

Proposed effective date: when approved

Proposed changes and justification

This memo requests that you add BIO 267 to elective lists on three curricular plans as indicated below:

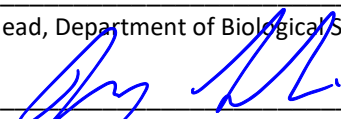
Curriculum	Elective List	Sub-list
17BIOSCBS (and all subplans)	Advanced Writing Requirement	
17ZOOBS	Advanced Writing Requirement	
17BIOBA	Communication and Writing	Writing Courses

SIGNATURES:



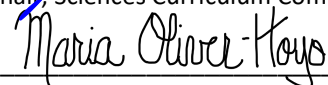
2/12/2021

Head, Department of Biological Sciences Date



3/1/21

Chair, Sciences Curriculum Committee Date



March 1, 2021

Assoc. Dean of Academic Affairs, College of Sciences Date

Chair, University Courses & Curricula Committee Date

PROPOSED EFFECTIVE DATE: when approved

Dean, Academic and Student Affairs Date

APPROVED EFFECTIVE DATE: _____

NC STATE UNIVERSITY

TO: Office of the Dean for Academic and Student Affairs
FROM: Lisa Parks, Director of Undergraduate Programs, BS in Biological Sciences
RE: 17BIOSCMCD -- changes to accommodate the change in BCH 351 credit hours
DATE: 12 October 2020

Proposed effective date: June 2021

Proposed changes and justification

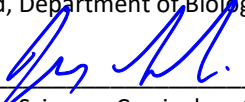
The change in BCH 351 credit hours (from 4 to 3) requires us to modify our undergraduate curricular requirements. This memo proposes to change the biochemistry requirement for our Molecular, Cellular, and Developmental Biology concentration (17BIOSCMCD) within the BS in Biological Sciences.

We proposed removing BCH 351 from the options for our students to complete their biochemistry requirement. This will leave BCH 451 (4 cr) as the only option. No other changes are needed.

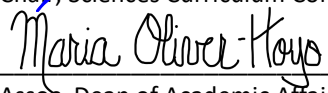
SIGNATURES:



Head, Department of Biological Sciences 10/14/20_____
Date



Chair, Sciences Curriculum Committee 3/1/21_____
Date



Assoc. Dean of Academic Affairs, College of Sciences March 1, 2021_____
Date

Chair, University Courses & Curricula Committee Date

PROPOSED EFFECTIVE DATE: June 2021

Dean, Academic and Student Affairs Date

APPROVED EFFECTIVE DATE: _____

Economics (BA) (20ECONBA)

Semester Display 10-3-16 (v2.4)

FRESHMAN YEAR				
Fall Semester	Credits		Spring Semester	Credits
M 100 Professionalism, Diversity and Acad Success in Mgmt ¹	1		MA 114 Finite Math ⁴	3
ENG 101 ² or Natural Science (with Lab) ³	4		Communications ⁷ or Humanities ⁸	3
MA 121/131/141 Calculus ⁴	3		ENG 101 ² or Natural Science (with Lab) ³	4
FL_ 201 ⁵	3		EC 201 Principles of Microeconomics ⁹	3
MIE 201 Intro to Bus Processes	3		ACC 210 Concepts of Financial Reporting	3
HESF 1** Health & Exercise Studies Course ⁶	1			
	15			16
SOPHOMORE YEAR				
Fall Semester	Credits		Spring Semester	Credits
EC 301 Intermediate Microeconomics	3		EC 302 Intermediate Macroeconomics	3
BUS/ST 350 Econ Bus Statistics ¹⁰	3		Humanities ⁸	3
Communications ⁷ or Humanities ⁸	3		Additional Breadth ¹³	3
Natural Science ³	3		Free Electives ¹⁴	6
Interdisciplinary Perspectives ¹¹	2		ST 307 Intro to Statistical Programming - SAS	1
HES_ *** Health & Exercise Studies Course ¹²	1			
	15			16
JUNIOR YEAR				
Fall Semester	Credits		Spring Semester	Credits
EC 480, Intro to Economic Research, or			Economics Elective ¹⁵	3
EC 351, Data Analysis for Economists	3		Social Science ¹⁷	3
Advised Elective ¹⁸	3		Advised Electives ¹⁸ (take two)	6
Economics Elective ¹⁵	3		Free Electives ¹⁴	3
Advanced Writing ¹⁶	3			
Free Electives ¹⁴	6			
	15			15
SENIOR YEAR				
Fall Semester	Credits		Spring Semester	Credits
Economics Electives ¹⁵ (take two)	6		EC 490 Research Seminar in Economics	3
Advised Electives ¹⁸ (take two)	6		Economics Elective ¹⁵	3
Free Elective ¹⁴	3		Advised Elective ¹⁸	3
			Free Elective ¹⁴	4
	15			13
Minimum Credit Hours Required for Graduation*:				120

GPA Graduation Requirements:

Overall GPA for all courses attempted at NC State must be 2.0 or higher; and

Overall GPA for all EC and ECG courses attempted at NC State must be 2.0 or higher.

1. Students should take M 100 their first semester in the program.
2. Must be completed with "C-" or better.
3. 7 credit hours-include one laboratory course or course with a lab from the GEP Natural Sciences list.
4. MA 131 or MA 141 are encouraged for students who qualify and aspire to take additional calculus. For students completing the MA 141/241/242 sequence, one credit hour of MA141 will count as free elective credit, MA 241 will count as free elective credit and MA 242 will substitute for MA 114.
5. Unless a placement exam is completed successfully, students are required to complete FL_ 201 – the third semester of a foreign language (through the intermediate level). Students will not receive credit for courses below 102 unless starting a language different from their high school proficiency. Students who place beyond FL_201 and choose not to take a foreign language course will have satisfied the foreign language requirement but will not receive hour credit.
6. 1 hour of Health & Exercise Studies at the 100 level.
7. COM 110, 112, or 211
8. Choose two courses from the GEP Humanities list from two different subject areas.
9. EC 205 or ARE 201 may substitute.
10. ST 302, ST 361, ST 370 or 372 may substitute for ST/BUS 350. Credit will not be given for more than one of these courses.
11. Choose one course from the GEP Interdisciplinary Perspectives list. For students completing a three-credit IP course, one credit will count in free electives.
12. PEC, PEF, PEH, PEO, and PES courses **cannot** be taken to satisfy this requirement. (HES courses may be taken credit only.)
13. Take one from the GEP Additional Breadth- Humanities/Social Sciences/Visual Performing Arts list.
14. Free Electives (22 credits) – Some courses will not count as free electives, such as FL 101 or 105 (in the language in which proficiency requirement is met), or MA 101, 101, 103, 105. (12 hours of free electives may be taken for credit only.)
15. Economics Electives (15 credits) – 300/400/500 level EC/ECG courses. At least 6 hours must be at the 400/500 level.
16. Choose from: ENG 331, 332, or 333.
17. One course from the GEP Social Sciences list.
18. Advised Electives (18 credits) – Students are urged to discuss these courses with their adviser and to consider using these electives to pursue a minor. Chosen from any university course offerings except FL 101 or 105 (in the language in which proficiency requirement is met), or MA 101, 103, 105 or PE/PEH courses. (NOTE: Certain courses may not be taken in combination with other courses of similar content. SEE CATALOG FOR RESTRICTIONS.)

*Students must also complete as a part of their general education requirements one course from the GEP U.S. Diversity list (no credit hour requirement) and one course from the GEP Global Knowledge list (no credit hour requirement).

CURRICULUM REQUIREMENTS

Format B

<u>Degree/Plan Title:</u> B.A. Economics	<u>Plan SIS Code:</u>
Concentration/Subplan Title: Subplan SIS Code:	
<u>Indicate requirements status:</u> Current: Proposed: x <u>Proposed</u> Effective Semester: Spring 2017	
<u>New Degree Audit required?</u> (Y or N) Y	
<u>Critical Path Courses</u> - Identify using the code (CP) which courses are considered critical path courses which represent specific major requirements that are predictive of student success in a given program/plan. Place the (CP) next to the credit hours for the course.	

MAJOR FIELD OF STUDY REQUIREMENTS:		
<i>Required Courses/Groups/ Electives:</i>	<i>Credit Hours</i>	<i>GEP category, if applicable</i>
Indicate if course or course groupings have a C-wall or MGPA requirement and which are considered Critical Path courses – indicate with (CP) next to applic. course.		List GEP category and hours satisfied by a Major requirement
Math MA 121 or 131 or 141; MA 114 (MA 114 or 242)	6	Mathematics (6 hours)
Major (non- EC)		
Advanced Writing (ENG 331, 332, 333)	3	Advanced Communication (3 hours)
FL 201	3	
Communication/Speech (COM 110, 112, 211)	3	
ACC 210	3	
MIE 201	3	Interdisciplinary Perspectives (3 hours)
BUS/ST 350	3	Technology Fluency (3 hours)
ST 307	1	
Major (EC/ECG)		
EC 201 (EC 201 or 205 or ARE 201)	3	Social Sciences (3 hours)
EC 301	3	
EC 302	3	
EC 351 or 480	3	
EC 490	3	
Economics Electives: 300/400/500 level EC/ECG courses. At least 6 hours must be at the 400/500 level	15	Technology Fluency (3 hours)
Concentration Courses/Groups/Electives: Advised Electives: Please consult with academic advisor. May not be MA 101, 103, 105, or FL 101 or 105 (in the language in which proficiency is met) or HES courses.	18	
Free Electives: May not be MA 101, 103, 105, or FL 101 or 105 (in the language in which proficiency is met)	22	This assumes students complete a 2 hr Interdisciplinary Perspectives course
Total credit hours under Major Field of Study: <i>Minimum 27 hours required in program area.</i>	92 hours	

COLLEGE REQUIREMENTS:		
Orientation Course(s): M 100	1	U.S. Diversity Corequisite
Other:	0	
Total credit hours under College Requirements:	93 Hours	

NCSU GENERAL EDUCATION PROGRAM REQUIREMENTS		At least one of the following must be listed:
<p><i>Courses in the Major and/or Minor may also fulfill a General Education requirement; however, a GEP category may not be subset to require a specific course from the category list. Required courses must be listed in the Major/College requirements.</i></p> <p><i>Specific courses should not be listed in any of the fields below other than ENG 101.</i></p>		<ol style="list-style-type: none"> 1 Choose course(s) from the University Approved GEP course list for this category. 2 Minimum requirements are satisfied by Major/College course requirements. 3 Major/College course requirement satisfies <u>X</u> credit hrs of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category. 4 Co-requisite is satisfied by a Major/College course requirement. 5 Choose course(s) from the University Approved GEP course lists for the Humanities/ Social Sciences/ Visual & Performing Arts. 6 Choose course(s) from the University Approved GEP course lists for Natural Sciences/Mathematical Sciences.
General Education Program Requirements: Minimum 39-40 hrs	Credit hours	How will the GEP requirement be met? (Choose applicable statement from 1-6 listed above)
Mathematical Sciences (6 credits) (At least 1 course with MA or ST prefix) <i>Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.</i>	X	7 (Choose statement 1, 2 or 3) Minimum requirements are satisfied by Major/College course requirements.
Natural Sciences (7 credits) (At least 1 lab course or course with a lab) <i>Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.</i>	7	8 (Choose statement 1, 2 or 3) Choose course(s) from the University Approved GEP course list for this category.
English 101 (C- or better required) (4 credits)	4	ENG 101
Humanities (6 credits) (Courses from two different disciplines) <i>Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.</i>	6	9 (Choose statement 1, 2 or 3) Choose course(s) from the University Approved GEP course list for this category.
Social Sciences (6 credits) (Courses from two different disciplines) <i>Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.</i>	3	10 (Choose statement 1, 2 or 3) Major/College course requirement satisfies 3 credit hrs of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category.
Additional Breadth (3 credits) (Choose approach that is different from the approach of the Major) <i>Major/College requirements cannot satisfy this requirement and an AB course cannot be double-counted except in satisfying the Global Knowledge or U.S. Diversity co-requisites.</i>	3	(Choose statement 5 or 6) 11 Choose course(s) from the University Approved GEP course lists for the Humanities/ Social Sciences/ Visual & Performing Arts.
Interdisciplinary Perspectives (5 credits) <i>Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.</i>	2	12 (Choose statement 1, 2 or 3) Major/College course requirement satisfies 3 credit hrs of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category.
Health and Exercise Studies (2 credits) (Including one Fitness and Wellness course)	2	Choose course(s) from the University Approved GEP course list for this category.
Total credit hours needed to complete GEP that are not satisfied as part of the Major/College requirements.	27 hours	
GEP Co-Requisites:		<i>Courses taken in the Major, GEP, or Minor may double-count to fulfill the co-requisites. Courses that satisfy the U.S. Diversity or Global Knowledge co-requisite are marked on course lists with a "USD" or "GK" indicator.</i>

U.S. Diversity co-requisite	(USD)	n/a	13 <i>(Choose statement 1 or 4)</i> Co-requisite is satisfied by a Major/College course requirement.
Global Knowledge co-requisite	(GK)	n/a	14 <i>(Choose statement 1 or 4)</i> Choose course(s) from the University Approved GEP course list for this category.
Foreign Language Proficiency		n/a	FL 201 required.
The following requirements must be satisfied within the College/Program:		x	Place an X in the credit hour box to indicate below that the requirement is "Satisfied by College/Program Requirements"
Communication in the Major (Advanced Communication)		X	Satisfied by College/Program Requirements
Technology Fluency		X	Satisfied by College/Program Requirements
Total credit hours required to complete Degree: Total must be within 120-128 credit hours.		120 Total hours	As applicable, indicate here the overall GPA requirement for degree completion including course completion.



Poole College of Management
Office of Undergraduate Programs

poole.ncsu.edu

2150 Nelson Hall
Campus Box 8164
Raleigh, NC 27695-7229
P: 919.515.5565

MEMO

Date: February 17, 2021

To: Bret Smith, Division of Academic and Student Affairs

From: Dr. Lee Craig, Department Head, Economics, Poole College of Management

Subject: Deletion of the Quantitative/Research Elective Requirement for Economics BA degree

The Economics Department would like to request that the Quantitative/Research Elective requirement for the Bachelor of Arts Degree in Economics be deleted. Due to resource constraints, the department is no longer be able to offer one of the courses currently listed as part of the Quantitative/Research Elective requirement. We believe that deleting that requirement and adding the 3 credits formerly included with that to the Advised Electives portion of the Economics BA degree will benefit current and future students. As this provides additional flexibility for students, we would like to request that this change be effective immediately and updated for the 2171 requirement term.

The revised 2171 Format B form for the degree is included with this memo, along with specifics below.

Current Economics BA Degree:

Quantitative/Research Elective Requirement (3 credits) – EC 351 or EC 480

Advised Electives (15 credits)

Revised Economics BA Degree:

~~Quantitative/Research Elective Requirement (0 credits)~~

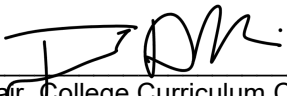
Advised Electives (18 credits)

Endorsed By:

DocuSigned by:

8680ED598E7541B...

Department Head, Economics
February 17, 2021
Date



Chair, College Curriculum Committee
2-16-2021
Date

DocuSigned by:

52D1470AC74C470...

College Dean
February 17, 2021
Date

Approved By:

Chair, University Courses & Curricula Committee
Date

Dean, DASA
Date

Certificate Of Completion

Envelope Id: 8BC9DA570EFA49AAACB837A7B61B6CA4	Status: Completed
Subject: Please DocuSign: ECONBA Quant Requirement Deletion Memo.pdf	
Source Envelope:	
Document Pages: 2	Signatures: 2
Certificate Pages: 5	Initials: 0
AutoNav: Enabled	Envelope Originator:
Envelopeld Stamping: Enabled	Allison Smith
Time Zone: (UTC-05:00) Eastern Time (US & Canada)	2801 Founders Drive
	Raleigh, NC 27605
	asmith32@ncsu.edu
	IP Address: 136.56.165.134

Record Tracking

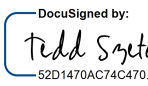
Status: Original	Holder: Allison Smith	Location: DocuSign
2/17/2021 10:03:40 AM	asmith32@ncsu.edu	

Signer Events

Signature Lee Craig lacraig@ncsu.edu Department Head Security Level: Email, Account Authentication (None)	Signature  <small>DocuSigned by: Lee Craig 8680ED598E7541B...</small> Signature Adoption: Pre-selected Style Using IP Address: 70.250.115.43	Timestamp Sent: 2/17/2021 10:09:05 AM Viewed: 2/17/2021 12:08:27 PM Signed: 2/17/2021 12:08:43 PM
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Electronic Record and Signature Disclosure:

Accepted: 2/17/2021 12:08:27 PM
 ID: 0895f589-3480-4c0f-902b-05ed17b10912
 Company Name: North Carolina State University - Poole College of Management

Tedd Szeto tszeto@ncsu.edu Security Level: Email, Account Authentication (None)	 <small>DocuSigned by: Tedd Szeto 52D1470AC74C470...</small> Signature Adoption: Pre-selected Style Using IP Address: 76.182.2.22	Sent: 2/17/2021 12:08:46 PM Viewed: 2/17/2021 12:21:26 PM Signed: 2/17/2021 12:21:54 PM
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Electronic Record and Signature Disclosure:

Accepted: 2/17/2021 12:21:26 PM
 ID: 46cfa89a-3562-460d-b6c0-1dafec166a9a
 Company Name: North Carolina State University - Poole College of Management

In Person Signer Events	Signature	Timestamp
Editor Delivery Events	Status	Timestamp
Agent Delivery Events	Status	Timestamp
Intermediary Delivery Events	Status	Timestamp
Certified Delivery Events	Status	Timestamp
Carbon Copy Events	Status	Timestamp
Witness Events	Signature	Timestamp
Notary Events	Signature	Timestamp
Envelope Summary Events	Status	Timestamps

Envelope Summary Events	Status	Timestamps
Envelope Sent	Hashed/Encrypted	2/17/2021 10:09:05 AM
Certified Delivered	Security Checked	2/17/2021 12:21:26 PM
Signing Complete	Security Checked	2/17/2021 12:21:54 PM
Completed	Security Checked	2/17/2021 12:21:54 PM
Payment Events	Status	Timestamps
Electronic Record and Signature Disclosure		

ELECTRONIC RECORD AND SIGNATURE DISCLOSURE

From time to time, North Carolina State University - Poole College of Management (we, us or Company) may be required by law to provide to you certain written notices or disclosures. Described below are the terms and conditions for providing to you such notices and disclosures electronically through the DocuSign system. Please read the information below carefully and thoroughly, and if you can access this information electronically to your satisfaction and agree to this Electronic Record and Signature Disclosure (ERSD), please confirm your agreement by selecting the check-box next to 'I agree to use electronic records and signatures' before clicking 'CONTINUE' within the DocuSign system.

Getting paper copies

At any time, you may request from us a paper copy of any record provided or made available electronically to you by us. You will have the ability to download and print documents we send to you through the DocuSign system during and immediately after the signing session and, if you elect to create a DocuSign account, you may access the documents for a limited period of time (usually 30 days) after such documents are first sent to you. After such time, if you wish for us to send you paper copies of any such documents from our office to you, you will be charged a \$0.00 per-page fee. You may request delivery of such paper copies from us by following the procedure described below.

Withdrawing your consent

If you decide to receive notices and disclosures from us electronically, you may at any time change your mind and tell us that thereafter you want to receive required notices and disclosures only in paper format. How you must inform us of your decision to receive future notices and disclosure in paper format and withdraw your consent to receive notices and disclosures electronically is described below.

Consequences of changing your mind

If you elect to receive required notices and disclosures only in paper format, it will slow the speed at which we can complete certain steps in transactions with you and delivering services to you because we will need first to send the required notices or disclosures to you in paper format, and then wait until we receive back from you your acknowledgment of your receipt of such paper notices or disclosures. Further, you will no longer be able to use the DocuSign system to receive required notices and consents electronically from us or to sign electronically documents from us.

All notices and disclosures will be sent to you electronically

Unless you tell us otherwise in accordance with the procedures described herein, we will provide electronically to you through the DocuSign system all required notices, disclosures, authorizations, acknowledgements, and other documents that are required to be provided or made available to you during the course of our relationship with you. To reduce the chance of you inadvertently not receiving any notice or disclosure, we prefer to provide all of the required notices and disclosures to you by the same method and to the same address that you have given us. Thus, you can receive all the disclosures and notices electronically or in paper format through the paper mail delivery system. If you do not agree with this process, please let us know as described below. Please also see the paragraph immediately above that describes the consequences of your electing not to receive delivery of the notices and disclosures electronically from us.

How to contact North Carolina State University - Poole College of Management:

You may contact us to let us know of your changes as to how we may contact you electronically, to request paper copies of certain information from us, and to withdraw your prior consent to receive notices and disclosures electronically as follows:

To contact us by email send messages to: mamerry@ncsu.edu

To advise North Carolina State University - Poole College of Management of your new email address

To let us know of a change in your email address where we should send notices and disclosures electronically to you, you must send an email message to us at mamerry@ncsu.edu and in the body of such request you must state: your previous email address, your new email address. We do not require any other information from you to change your email address.

If you created a DocuSign account, you may update it with your new email address through your account preferences.

To request paper copies from North Carolina State University - Poole College of Management

To request delivery from us of paper copies of the notices and disclosures previously provided by us to you electronically, you must send us an email to mamerry@ncsu.edu and in the body of such request you must state your email address, full name, mailing address, and telephone number. We will bill you for any fees at that time, if any.

To withdraw your consent with North Carolina State University - Poole College of Management

To inform us that you no longer wish to receive future notices and disclosures in electronic format you may:

- i. decline to sign a document from within your signing session, and on the subsequent page, select the check-box indicating you wish to withdraw your consent, or you may;
- ii. send us an email to mamerry@ncsu.edu and in the body of such request you must state your email, full name, mailing address, and telephone number. We do not need any other information from you to withdraw consent.. The consequences of your withdrawing consent for online documents will be that transactions may take a longer time to process..

Required hardware and software

The minimum system requirements for using the DocuSign system may change over time. The current system requirements are found here: <https://support.docusign.com/guides/signer-guide-signing-system-requirements>.

Acknowledging your access and consent to receive and sign documents electronically

To confirm to us that you can access this information electronically, which will be similar to other electronic notices and disclosures that we will provide to you, please confirm that you have read this ERSD, and (i) that you are able to print on paper or electronically save this ERSD for your future reference and access; or (ii) that you are able to email this ERSD to an email address where you will be able to print on paper or save it for your future reference and access. Further, if you consent to receiving notices and disclosures exclusively in electronic format as described herein, then select the check-box next to 'I agree to use electronic records and signatures' before clicking 'CONTINUE' within the DocuSign system.

By selecting the check-box next to 'I agree to use electronic records and signatures', you confirm that:

- You can access and read this Electronic Record and Signature Disclosure; and
- You can print on paper this Electronic Record and Signature Disclosure, or save or send this Electronic Record and Disclosure to a location where you can print it, for future reference and access; and
- Until or unless you notify North Carolina State University - Poole College of Management as described above, you consent to receive exclusively through electronic means all notices, disclosures, authorizations, acknowledgements, and other documents that are required to be provided or made available to you by North Carolina State University - Poole College of Management during the course of your relationship with North Carolina State University - Poole College of Management.

MEMORANDUM

Date: February 9, 2021

To: Dr. Bret Smith, Interim Dean for Division of Academic and Student Affairs

From: Dr. Rudi Seracino, Associate Head for Undergraduate Programs, Department of Civil, Construction, and Environmental Engineering

Re: Curriculum Action for BS Civil Engineering (**14CEBS**)

Proposed Revisions:

The proposed changes to the **14CEBS** curriculum are required to accommodate the approved major course action to **CE 332: Civil Engineering Materials**. Revisions to CE 332 that affect this curriculum include the title change and increase in credit hours from 3 to 4. CE 332 is an elective in the Junior Year CE Core Course – Lab Intensive Elective group. As all the lecture/lab courses in this elective group are now 4 credit hours, the minimum credit hours required for graduation is increased by 1 credit hour to 126 total.

Proposed Changes in Format A and B displays:

The attached 'marked-up' Format A and B displays identify all the proposed changes with red color font and strikethrough.

Justification for Change:

CE 332 is one of two lab intensive courses in the 14CEBS curriculum, meeting the minimum lab experience requirements for ABET accreditation. The approved CE 332 course action increases the minimum credit hours to meet graduation requirements of the 14CEBS curriculum from 125 to 126, which is within the approved limits of 120 – 128 for this engineering degree.

Consultation with other Departments:

None required as the revision involves a CE only course in the 14CEBS curriculum.

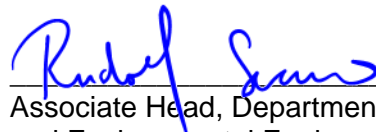
Impact on Other Departments or Programs:

None.

Proposed Effective Date for Revision:

August, 2021

ENDORSED BY:



Associate Head, Department of Civil, Construction,
and Environmental Engineering

02/09/2021
Date

RECOMMENDED BY:

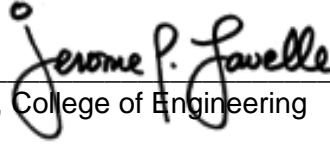


Chair, College Curriculum Committee

2/24/21

Date

ENDORSED BY:



Dean, College of Engineering

02/26/2-21

Date

RECOMMENDED BY:

Chair, University Courses & Curricula Committee

Date

APPROVED BY:

Dean, Division of Academic and Student Affairs

Date

EFFECTIVE DATE:

FORMAT A – MARKED-UP Version
(SEMESTER-BY-SEMESTER CURRICULUM DISPLAY)

Indicate display status: Current: Proposed: **X**Proposed Effective Semester: **Fall 20192021**Degree/Plan Title: **Bachelor of Science in Civil Engineering**

Concentration/Subplan Title:

Plan SIS Code: **14CEBS**

Subplan SIS Code:

New Degree Audit required? (Y or N) **Yes**

Critical Path Courses - Identify using the code (CP) which courses are considered critical path courses which represent specific major requirements that are predictive of student success in a given program/plan. Place the (CP) next to the credit hours for the course.

FRESHMAN YEAR

FALL SEMESTER	CREDITS	SPRING SEMESTER	CREDITS
CH 101 Chemistry, A Molecular Science	3	EC 205 Economics (GEP Req) ¹	3
CH 102 General Chemistry Laboratory	1	MA 241 Calculus II	4
E 101 Introduction to Engr & Prob. Solving	1	PY 205 Physics for Engineers & Scientists I	3
E 115 Intro to Computing Environments	1	PY 206 Physics for Engineers & Scientists I Lab	1
ENG 101 Academic Writing and Research	4	E 102 Engineering in the 21 st Century (GEP Req) ¹	2
MA 141 Calculus I	4	GEP Requirement ¹	3
HESF 1XX Fitness & Wellness Course	1		
<i>Total:</i>	15	<i>Total:</i>	16

SOPHOMORE YEAR

FALL SEMESTER	CREDITS	SPRING SEMESTER	CREDITS
CE 214 Engineering Mechanics – Statics	3 (CP)	CE 225 Mechanics of Solids	3 (CP)
CE 250 Introduction to Sustainable Infrastructure	3 (CP)	CE 282 Hydraulics	3 (CP)
CSC 111 Introduction to Computing: Python	3	PY 208 Physics for Engineers & Scientists II	3
TDE 220 Civil Engineering Graphics	3	PY 209 Physics for Engineers & Scientists II Lab	1
MA 242 Calculus III	4	MA 341 Applied Differential Eq OR	
		MA 305 Elem Linear Algebra	3
		MSE 200 Mech Prop of Struct Mat	3
		HES *** Phys. Ed/Healthy Living Course	1
<i>Total:</i>	16	<i>Total:</i>	17

JUNIOR YEAR

FALL SEMESTER	CREDITS	SPRING SEMESTER	CREDITS
CE Core Course – Lab Intensive Elective I ²	3 /4	CE Core Course – Lab Intensive Elective II ²	4/ 3
CE Core Course – Elective I ³	3	CE Core Course – Elective II ³	3
CE Junior Elective I ⁴	3	CE Junior Elective II ⁴	3
ST 370 Prob & Stat for Engineers	3	Basic Science Elective ⁷	3
GEP Requirement ¹	3	Engineering Science Elective ⁸	3
<i>Total:</i>	15 /16	<i>Total:</i>	16/ 15

SENIOR YEAR

FALL SEMESTER	CREDITS	SPRING SEMESTER	CREDITS
CE Senior Elective I ⁵	3	CE Senior Elective III ⁵	3
CE Senior Elective II ⁵	3	CE Senior Elective IV ⁵	3
Senior Elective ⁹	3	CE Senior Design ⁶	3
GEP Requirement ¹	3	GEP Requirement ¹	3
COM 110 Public Speaking OR		GEP Requirement ¹	3
ENG 331 Communication for Engr. & Tech.	3		
<i>Total:</i>	15	<i>Total:</i>	15

Minimum Credit Hours Required for Graduation*: ~~125~~126**Major/Program Footnotes:**¹GEP Requirements to be selected from the appropriate lists in consultation with the advisor.^{2,3}CE Core Courses, ⁴CE Junior Electives, ⁵CE Senior Electives, ⁶CE Senior Design, ⁷Basic Science Elective, ⁸Engineering Science Elective, ⁹Senior Elective: select from lists on worksheet in consultation with advisor.

(CP) Critical Path major course predictive of student success.

*Foreign Language Proficiency at the FL_102 level is required for graduation.

¹ **General Education Program (GEP) requirements and GEP Footnotes:**

To complete the requirements for graduation and the General Education Program, the following category credit hours and co-requisites must be satisfied.

University approved GEP course lists for each of the following categories can be found at <http://www.ncsu.edu/uap/academic-standards/gep/courselists/index.html>.

- A. **Mathematical Sciences** (6 credit hours – one course with MA or ST prefix)
Fulfilled as part of Major requirements.
- B. **Natural Sciences** (7 credit hours – include one laboratory course or course with a lab)
Fulfilled as part of Major requirements.
- C. **Humanities** (6 credit hours selected from two different disciplines/course prefixes)
Choose from the University approved GEP Humanities course list.
- D. **Social Sciences** (6 credit hours selected from two different disciplines/course prefixes)
EC 205 (or EC 201 or ARE 201) taken as part of the Major requirements, satisfies 3 credit hours needed to fulfill the GEP Social Sciences requirement.
Choose 3 credit hours from University approved GEP Social Sciences course list.
- E. **Physical Education/Healthy Living** (2 credit hours – at least one 100-level Fitness and Wellness Course)
Choose from the University approved GEP Physical Education/Healthy Living course list.
- F. **Additional Breadth** - (3 credit hours to be selected from the following checked University approved GEP course lists)
☒ Humanities/Social Sciences/Visual and Performing Arts or _____ Mathematical Sciences/Natural Sciences/Engineering
- G. **Interdisciplinary Perspectives** (5-6 credit hours)
E 102 taken as part of the Major requirements satisfies 2 credit hours needed to fulfill the GEP Interdisciplinary perspectives requirement.
Choose 3 credit hours from the University approved GEP Interdisciplinary Perspectives course list.
- H. **Introduction to Writing** (4 credit hours satisfied by completing ENG 101 with a C- or better)

The following **Co-Requisites** must be satisfied to complete the General Education Program requirements:

- I. **U.S. Diversity** (USD)
Choose from the University approved GEP U.S. Diversity course list.
- J. **Global Knowledge** (GK)
Choose from the University approved GEP Global Knowledge course list.
- K. **Foreign Language proficiency** - Proficiency at the FL_102 level is required for graduation.

² CE Core Course – Lab Intensive Elective: (choose 2 of the following)

- CE332 ~~Civil Engineering Materials of Construction~~ (F/S) – (MSE200 and C- or better in CE225)
 CE342 Engineering Behavior of Soils and Foundations (F/S) – (C- or better in CE225 and CE282)

³ CE Core Course – Elective: (choose 2 of the following)

- CE305 Traffic Engineering (F/S) – (C- or better in CE250; Corequisite: ST370)
 CE327 Reinforced Concrete Design (F/S) ⁴²⁰ – (C- or better in CE225)
 CE339 Civil Engineering Systems (S only) – (Junior standing, CSC111 and [MA341 or MA305])
 CE383 Hydrology and Urban Water Systems (F/S) – (C- or better in CE282; Corequisite: ST370; CE, ENE, CON majors only)

⁴ CE Junior Elective: (choose 2 of the following, including courses not used as a **³ CE Core Course – Elective**)

- CE301 Civil Engineering Surveying and Geomatics (F/S) – (Junior standing, CON, CE majors only)
 CE325 Structural Analysis I (F/S) ⁴²⁰ – (CSC111, C- or better in CE225)
 CE367 Mechanical and Electrical Systems in Building (S only) – (C- or better in CE282)
 CE373 Fundamentals of Environmental Engineering (F/S) – (Corequisite: CE250 and [CHE205 or CE282])

⁵ CE Senior Elective: (choose 4 of the following – at least 2 CE4xx courses must be design intensive [D] from different areas)**Advised Elective from CE Course Offerings**

Approved courses selected in consultation with your advisor.

Core Course Elective & Junior Electives

Up to 2 courses may be selected from CE Core Course – Electives³ and CE Junior Electives⁴ not previously used.

Coastal Engineering & Water Resources

- CE487 Introduction to Coastal and Ocean Engineering (S only) – (Senior standing and CE282)
 CE488 Water Resources Engineering [D] (F only - must take CE339 in Spring Junior Year) ⁴⁵⁰ – (CE339, CE383)

Computing & Systems

- CE437 Civil Engineering Computing (F only) – (Senior standing; CSC111 and [MA341 or MA305])

Construction Engineering

- CE466 Building Construction Engineering [D] (F only - must take CE327 in Junior Year) – (CE327)

Environmental Engineering

- CE476 Air Pollution Control [D] (F only) – (CE373, MAE201; Corequisite: ST370 or CHE450 [CHE majors])
 CE477 Principles of Solid Waste Engineering [D] (S only - must take CE373 in Junior Year) – (CE250, CE282, CE373)
 CE478 Energy and Climate (F only) – (Senior standing)
 CE479 Air Quality (S only - must take CE373 in Junior Year) – (CE373; CE282 or CHE311 [CHE majors] or MEA421 [MEA majors], Corequisite: ST370 or ST380 [MEA majors])
 CE484 Water Supply and Waste Water Systems [D] (F only - must take CE373 in Junior Year) – (CE282, CE373)

Geotechnical Engineering

- CE435 Engineering Geology (varies) – (MEA101 and Junior standing)
 CE443 Seepage, Earth Embankment and Retaining Structures [D] (S only) ⁴⁵⁰ – (C- or better in CE342)
 CE444 An Introduction to Foundation Engineering [D] (F only) ⁴⁵⁰ – (C- or better in CE342)

Structural Engineering

- CE426 Structural Steel Design [D] (F/S) ⁴²⁰ – (C- or better in CE225)

Transportation Engineering & Materials

- CE401 Transportation Systems Engineering (F only) – (C- or better in CE305)
 CE402 Traffic Operations [D] (F only) – (C- or better in CE305)
 CE403 Highway Design [D] (S only) ⁴⁵⁰ – (C- or better in CE305)
 CE405 Railroad System Planning, Design and Operation (S only, odd years) – (C- or better in CE305)
 CE413 Principles of Pavement Design [D] (F only) ⁴⁵⁰ – (CE332, CE342)

⁶ CE Senior Design: (choose 1 of the following)

- CE420 Structural Engineering Project (F/S) – (C- or better in CE325, CE327, CE342, and CE426)
 CE450 Civil Engineering Project (F/S) – (CE305, CE342, and CE383; Corequisite: one of CE488, CE443, CE444, CE403, or CE413)

⁷ Basic Science Elective: (choose 1 of the following)

- BIO181 Introductory Biology: Ecology, Evolution and Biodiversity
 BIO183 Introductory Biology: Cellular and Molecular Biology
 FOR260 Forest Ecology
 FW221 Conservation of Natural Resources
 MEA101 Geology I: Physical
 MEA200 Introduction to Oceanography
 SSC200 Soil Science

⁸ **Engineering Science Elective:** (choose 1 of the following)

ECE331 Principles of Electrical Engineering

MAE201 Engineering Thermodynamics I

MAE208 Engineering Dynamics

⁹ **Senior Elective:** (choose 1 of the following)

CE4xx course not used for **CE Senior Elective**⁵

CE499 Undergraduate Research Thesis in Civil, Construction and Environmental Engineering (restricted enrollment, consult with your advisor)

CE 5xx (from approved ABM list of courses – restricted enrollment, consult with your advisor)

ARC521 Daylighting and Passive Energy Systems for Architecture (F only)

ARC522 Building Energy Efficiency and Renewable Energy (F only)

ARC523 Building Energy Modeling and Simulation (F only) – (CE367)

ARC590 LEED Seminar (varies)

ARC590 Toward Sustainability: WELL and Living Buildings (varies)

MA3xx or higher

MAE440 Non-Destructive Testing and Evaluation (Fall only) - (*Junior/Senior standing*)

FORMAT A

(SEMESTER-BY-SEMESTER CURRICULUM DISPLAY)

Indicate display status: Current: Proposed: **X**Proposed Effective Semester: **Fall 2021**Degree/Plan Title: **Bachelor of Science in Civil Engineering**

Concentration/Subplan Title:

Plan SIS Code: **14CEBS**

Subplan SIS Code:

New Degree Audit required? (Y or N) **Yes**

Critical Path Courses - Identify using the code (CP) which courses are considered critical path courses which represent specific major requirements that are predictive of student success in a given program/plan. Place the (CP) next to the credit hours for the course.

FRESHMAN YEAR

FALL SEMESTER	CREDITS	SPRING SEMESTER	CREDITS
CH 101 Chemistry, A Molecular Science	3	EC 205 Economics (GEP Req) ¹	3
CH 102 General Chemistry Laboratory	1	MA 241 Calculus II	4
E 101 Introduction to Engr & Prob. Solving	1	PY 205 Physics for Engineers & Scientists I	3
E 115 Intro to Computing Environments	1	PY 206 Physics for Engineers & Scientists I Lab	1
ENG 101 Academic Writing and Research	4	E 102 Engineering in the 21 st Century (GEP Req) ¹	2
MA 141 Calculus I	4	GEP Requirement ¹	3
HESF 1XX Fitness & Wellness Course	1		
<i>Total:</i>	15	<i>Total:</i>	16

SOPHOMORE YEAR

FALL SEMESTER	CREDITS	SPRING SEMESTER	CREDITS
CE 214 Engineering Mechanics – Statics	3 (CP)	CE 225 Mechanics of Solids	3 (CP)
CE 250 Introduction to Sustainable Infrastructure	3 (CP)	CE 282 Hydraulics	3 (CP)
CSC 111 Introduction to Computing: Python	3	PY 208 Physics for Engineers & Scientists II	3
TDE 220 Civil Engineering Graphics	3	PY 209 Physics for Engineers & Scientists II Lab	1
MA 242 Calculus III	4	MA 341 Applied Differential Eq OR	
		MA 305 Elem Linear Algebra	3
		MSE 200 Mech Prop of Struct Mat	3
		HES *** Phys. Ed/Healthy Living Course	1
<i>Total:</i>	16	<i>Total:</i>	17

JUNIOR YEAR

FALL SEMESTER	CREDITS	SPRING SEMESTER	CREDITS
CE Core Course – Lab Intensive Elective I ²	4	CE Core Course – Lab Intensive Elective II ²	4
CE Core Course – Elective I ³	3	CE Core Course – Elective II ³	3
CE Junior Elective I ⁴	3	CE Junior Elective II ⁴	3
ST 370 Prob & Stat for Engineers	3	Basic Science Elective ⁷	3
GEP Requirement ¹	3	Engineering Science Elective ⁸	3
<i>Total:</i>	16	<i>Total:</i>	16

SENIOR YEAR

FALL SEMESTER	CREDITS	SPRING SEMESTER	CREDITS
CE Senior Elective I ⁵	3	CE Senior Elective III ⁵	3
CE Senior Elective II ⁵	3	CE Senior Elective IV ⁵	3
Senior Elective ⁹	3	CE Senior Design ⁶	3
GEP Requirement ¹	3	GEP Requirement ¹	3
COM 110 Public Speaking OR		GEP Requirement ¹	3
ENG 331 Communication for Engr. & Tech.	3		
<i>Total:</i>	15	<i>Total:</i>	15

Minimum Credit Hours Required for Graduation*: 126

Major/Program Footnotes:¹GEP Requirements to be selected from the appropriate lists in consultation with the advisor.^{2,3}CE Core Courses, ⁴CE Junior Electives, ⁵CE Senior Electives, ⁶CE Senior Design, ⁷Basic Science Elective, ⁸Engineering Science Elective, ⁹Senior Elective: select from lists on worksheet in consultation with advisor.

(CP) Critical Path major course predictive of student success.

*Foreign Language Proficiency at the FL_102 level is required for graduation.

¹General Education Program (GEP) requirements and GEP Footnotes:

To complete the requirements for graduation and the General Education Program, the following category credit hours and co-requisites must be satisfied.

University approved GEP course lists for each of the following categories can be found at <http://www.ncsu.edu/uap/academic-standards/gep/courselists/index.html>.

- A. **Mathematical Sciences** (6 credit hours – one course with MA or ST prefix)
Fulfilled as part of Major requirements.
- B. **Natural Sciences** (7 credit hours – include one laboratory course or course with a lab)
Fulfilled as part of Major requirements.
- C. **Humanities** (6 credit hours selected from two different disciplines/course prefixes)
Choose from the University approved GEP Humanities course list.
- D. **Social Sciences** (6 credit hours selected from two different disciplines/course prefixes)
EC 205 (or EC 201 or ARE 201) taken as part of the Major requirements, satisfies 3 credit hours needed to fulfill the GEP Social Sciences requirement.
Choose 3 credit hours from University approved GEP Social Sciences course list.
- E. **Physical Education/Healthy Living** (2 credit hours – at least one 100-level Fitness and Wellness Course)
Choose from the University approved GEP Physical Education/Healthy Living course list.
- F. **Additional Breadth** - (3 credit hours to be selected from the following checked University approved GEP course lists)
☒ Humanities/Social Sciences/Visual and Performing Arts or _____ Mathematical Sciences/Natural Sciences/Engineering
- G. **Interdisciplinary Perspectives** (5-6 credit hours)
E 102 taken as part of the Major requirements satisfies 2 credit hours needed to fulfill the GEP Interdisciplinary perspectives requirement.
Choose 3 credit hours from the University approved GEP Interdisciplinary Perspectives course list.
- H. **Introduction to Writing** (4 credit hours satisfied by completing ENG 101 with a C- or better)

The following **Co-Requisites** must be satisfied to complete the General Education Program requirements:

- I. **U.S. Diversity** (USD)
Choose from the University approved GEP U.S. Diversity course list.
- J. **Global Knowledge** (GK)
Choose from the University approved GEP Global Knowledge course list.
- K. **Foreign Language proficiency** - Proficiency at the FL_102 level is required for graduation.

² CE Core Course – Lab Intensive Elective: (choose 2 of the following)CE332 Materials of Construction (F/S) – (*MSE200 and C- or better in CE225*)CE342 Engineering Behavior of Soils and Foundations (F/S) – (*C- or better in CE225 and CE282*)**³ CE Core Course – Elective:** (choose 2 of the following)CE305 Traffic Engineering (F/S) – (*C- or better in CE250; Corequisite: ST370*)CE327 Reinforced Concrete Design (F/S) ⁴²⁰ – (*C- or better in CE225*)CE339 Civil Engineering Systems (S only) – (*Junior standing, CSC111 and [MA341 or MA305]*)CE383 Hydrology and Urban Water Systems (F/S) – (*C- or better in CE282; Corequisite: ST370; CE, ENE, CON majors only*)**⁴ CE Junior Elective:** (choose 2 of the following, including courses not used as a ³ CE Core Course – Elective)CE301 Civil Engineering Surveying and Geomatics (F/S) – (*Junior standing, CON, CE majors only*)CE325 Structural Analysis I (F/S) ⁴²⁰ – (*CSC111, C- or better in CE225*)CE367 Mechanical and Electrical Systems in Building (S only) – (*C- or better in CE282*)CE373 Fundamentals of Environmental Engineering (F/S) – (*Corequisite: CE250 and [CHE205 or CE282]*)**⁵ CE Senior Elective:** (choose 4 of the following – at least 2 CE4xx courses must be design intensive [D] from different areas)**Advised Elective from CE Course Offerings**

Approved courses selected in consultation with your advisor.

Core Course Elective & Junior ElectivesUp to 2 courses may be selected from CE Core Course – Electives³ and CE Junior Electives⁴ not previously used.**Coastal Engineering & Water Resources**CE487 Introduction to Coastal and Ocean Engineering (S only) – (*Senior standing and CE282*)CE488 Water Resources Engineering [D] (F only - must take CE339 in Spring Junior Year) ⁴⁵⁰ – (*CE339, CE383*)**Computing & Systems**CE437 Civil Engineering Computing (F only) – (*Senior standing; CSC111 and [MA341 or MA305]*)**Construction Engineering**CE466 Building Construction Engineering [D] (F only - must take CE327 in Junior Year) – (*CE327*)**Environmental Engineering**CE476 Air Pollution Control [D] (F only) – (*CE373, MAE201; Corequisite: ST370 or CHE450 [CHE majors]*)CE477 Principles of Solid Waste Engineering [D] (S only - must take CE373 in Junior Year) – (*CE250, CE282, CE373*)CE478 Energy and Climate (F only) – (*Senior standing*)CE479 Air Quality (S only - must take CE373 in Junior Year) – (*CE373; CE282 or CHE311 [CHE majors] or MEA421 [MEA majors], Corequisite: ST370 or ST380 [MEA majors]*)CE484 Water Supply and Waste Water Systems [D] (F only - must take CE373 in Junior Year) – (*CE282, CE373*)**Geotechnical Engineering**CE435 Engineering Geology (varies) – (*MEA101 and Junior standing*)CE443 Seepage, Earth Embankment and Retaining Structures [D] (S only) ⁴⁵⁰ – (*C- or better in CE342*)CE444 An Introduction to Foundation Engineering [D] (F only) ⁴⁵⁰ – (*C- or better in CE342*)**Structural Engineering**CE426 Structural Steel Design [D] (F/S) ⁴²⁰ – (*C- or better in CE225*)**Transportation Engineering & Materials**CE401 Transportation Systems Engineering (F only) – (*C- or better in CE305*)CE402 Traffic Operations [D] (F only) – (*C- or better in CE305*)CE403 Highway Design [D] (S only) ⁴⁵⁰ – (*C- or better in CE305*)CE405 Railroad System Planning, Design and Operation (S only, odd years) – (*C- or better in CE305*)CE413 Principles of Pavement Design [D] (F only) ⁴⁵⁰ – (*CE332, CE342*)**⁶ CE Senior Design:** (choose 1 of the following)CE420 Structural Engineering Project (F/S) – (*C- or better in CE325, CE327, CE342, and CE426*)CE450 Civil Engineering Project (F/S) – (*CE305, CE342, and CE383; Corequisite: one of CE488, CE443, CE444, CE403, or CE413*)**⁷ Basic Science Elective:** (choose 1 of the following)

BIO181 Introductory Biology: Ecology, Evolution and Biodiversity

BIO183 Introductory Biology: Cellular and Molecular Biology

FOR260 Forest Ecology

FW221 Conservation of Natural Resources

MEA101 Geology I: Physical

MEA200 Introduction to Oceanography

SSC200 Soil Science

⁸ **Engineering Science Elective:** (choose 1 of the following)

ECE331 Principles of Electrical Engineering

MAE201 Engineering Thermodynamics I

MAE208 Engineering Dynamics

⁹ **Senior Elective:** (choose 1 of the following)

CE4xx course not used for **CE Senior Elective**⁵

CE499 Undergraduate Research Thesis in Civil, Construction and Environmental Engineering (restricted enrollment, consult with your advisor)

CE 5xx (from approved ABM list of courses – restricted enrollment, consult with your advisor)

ARC521 Daylighting and Passive Energy Systems for Architecture (F only)

ARC522 Building Energy Efficiency and Renewable Energy (F only)

ARC523 Building Energy Modeling and Simulation (F only) – (CE367)

ARC590 LEED Seminar (varies)

ARC590 Toward Sustainability: WELL and Living Buildings (varies)

MA3xx or higher

MAE440 Non-Destructive Testing and Evaluation (Fall only) - (*Junior/Senior standing*)

<u>Degree/Plan Title:</u> Bachelor of Science in Civil Engineering		<u>Plan SIS Code:</u> 14CEBS
<u>Concentration/Subplan Title:</u>		<u>Subplan SIS Code:</u>
<u>Indicate requirements status:</u> Current:	Proposed: X	<u>Proposed</u> Effective Semester: Fall 20192021
<u>New Degree Audit required?</u> (Y or N) Yes		
<u>Critical Path Courses</u> - Identify using the code (CP) which courses are considered critical path courses which represent specific major requirements that are predictive of student success in a given program/plan. Place the (CP) next to the credit hours for the course.		

[illegible]

Concentration Courses/Groups/Electives:		
Free Electives:		
Total credit hours under Major Field of Study: <i>Minimum 27 hours required in program area.</i>	97-98 hours	
COLLEGE REQUIREMENTS:		
Orientation Course(s): E 101 and E 115	2	
Other: Economics Elective EC 205 (or EC 201 or ARE 201) E 102	3 2	Social Science (3 hours) Interdisciplinary Perspectives (2 hours)
Total credit hours under College Requirements:	7 hours	

<u>NCSU GENERAL EDUCATION PROGRAM REQUIREMENTS</u> <i>Courses in the Major and/or Minor may also fulfill a General Education requirement; however, a GEP category may not be subset to require a specific course from the category list. Required courses must be listed in the Major/College requirements.</i> <i>Specific courses should not be listed in any of the fields below other than ENG 101.</i>		<u>At least one of the following must be listed:</u> 1 Choose course(s) from the University Approved GEP course list for this category. 2 Minimum requirements are satisfied by Major/College course requirements. 3 Major/College course requirement satisfies <u>X</u> credit hrs of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category. 4 Co-requisite is satisfied by a Major/College course requirement. 5 Choose course(s) from the University Approved GEP course lists for the Humanities/ Social Sciences/ Visual & Performing Arts. 6 Choose course(s) from the University Approved GEP course lists for Natural Sciences/Mathematical Sciences.
General Education Program Requirements: <i>Minimum 39-40 hrs</i>	Credit hours	How will the GEP requirement be met? (Choose applicable statement from 1-6 listed above)
Mathematical Sciences (6 credits) (At least 1 course with MA or ST prefix) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	X	(Choose statement 1, 2 or 3) Minimum requirements are satisfied by Major/College course requirements.
Natural Sciences (7 credits) (At least 1 lab course or course with a lab) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	X	(Choose statement 1, 2 or 3) Minimum requirements are satisfied by Major/College course requirements.
English 101 (C- or better required) (4 credits)	4	ENG 101
Humanities (6 credits) (Courses from two different disciplines) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	6	(Choose statement 1, 2 or 3) Choose course(s) from the University Approved GEP course list for this category.
Social Sciences (6 credits) (Courses from two different disciplines) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	3	(Choose statement 1, 2 or 3) Major/College course requirement satisfies 3 credit hrs of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category.
Additional Breadth (3 credits) (Choose approach that is different from the approach of the Major) Major/College requirements cannot satisfy this requirement and an AB course cannot be double-counted except in satisfying the Global Knowledge or U.S. Diversity co-requisites.	3	(Choose statement 5 or 6) Choose course(s) from the University Approved GEP course list for this category.
Interdisciplinary Perspectives (5 credits) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	3	(Choose statement 1, 2 or 3) Major/College course requirement satisfies 2 credit hrs of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category.
Health and Exercise Studies (2 credits) (Including one Fitness and Wellness course)	2	Choose course(s) from the University Approved GEP course list for this category.
Total credit hours needed to complete GEP that are not satisfied as part of the Major/College requirements.	21 hours	

GEP Co-Requisites:			<i>Courses taken in the Major, GEP, or Minor may double-count to fulfill the co-requisites. Courses that satisfy the U.S. Diversity or Global Knowledge co-requisite are marked on course lists with a "USD" or "GK" indicator.</i>
U.S. Diversity co-requisite	(USD)	n/a	<i>(Choose statement 1 or 4)</i>
Global Knowledge co-requisite	(GK)	n/a	<i>(Choose statement 1 or 4)</i>
Foreign Language Proficiency		n/a	Proficiency at the FL_102 level required.
The following requirements must be satisfied within the College/Program:			Place an X in the credit hour box to indicate below that the requirement is "Satisfied by College/Program Requirements"
Communication in the Major (Advanced Communication)		n/a	Satisfied by College/Program Requirements
Technology Fluency		n/a	Satisfied by College/Program Requirements
Total credit hours required to complete Degree: Total must be within 120-128 credit hours.		125-126 Total Hours	As applicable, indicate here the overall GPA requirement for degree completion including course completion.

<u>Degree/Plan Title:</u> Bachelor of Science in Civil Engineering		<u>Plan SIS Code:</u> 14CEBS
<u>Concentration/Subplan Title:</u>		<u>Subplan SIS Code:</u>
<u>Indicate requirements status:</u> Current:	Proposed: X	<u>Proposed</u> Effective Semester: Fall 2021
<u>New Degree Audit required?</u> (Y or N) Yes		
<u>Critical Path Courses</u> - Identify using the code (CP) which courses are considered critical path courses which represent specific major requirements that are predictive of student success in a given program/plan. Place the (CP) next to the credit hours for the course.		

[illegible]

Concentration Courses/Groups/Electives:		
Free Electives:		
Total credit hours under Major Field of Study: <i>Minimum 27 hours required in program area.</i>	98 hours	
COLLEGE REQUIREMENTS:		
Orientation Course(s): E 101 and E 115	2	
Other: Economics Elective EC 205 (or EC 201 or ARE 201) E 102	3 2	Social Science (3 hours) Interdisciplinary Perspectives (2 hours)
Total credit hours under College Requirements:	7 hours	

<u>NCSU GENERAL EDUCATION PROGRAM REQUIREMENTS</u> <i>Courses in the Major and/or Minor may also fulfill a General Education requirement; however, a GEP category may not be subset to require a specific course from the category list. Required courses must be listed in the Major/College requirements.</i> <i>Specific courses should not be listed in any of the fields below other than ENG 101.</i>		<u>At least one of the following must be listed:</u> 1 Choose course(s) from the University Approved GEP course list for this category. 2 Minimum requirements are satisfied by Major/College course requirements. 3 Major/College course requirement satisfies X credit hrs of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category. 4 Co-requisite is satisfied by a Major/College course requirement. 5 Choose course(s) from the University Approved GEP course lists for the Humanities/ Social Sciences/ Visual & Performing Arts. 6 Choose course(s) from the University Approved GEP course lists for Natural Sciences/Mathematical Sciences.
General Education Program Requirements: <i>Minimum 39-40 hrs</i>	Credit hours	How will the GEP requirement be met? (Choose applicable statement from 1-6 listed above)
Mathematical Sciences (6 credits) (At least 1 course with MA or ST prefix) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	X	(Choose statement 1, 2 or 3) Minimum requirements are satisfied by Major/College course requirements.
Natural Sciences (7 credits) (At least 1 lab course or course with a lab) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	X	(Choose statement 1, 2 or 3) Minimum requirements are satisfied by Major/College course requirements.
English 101 (C- or better required) (4 credits)	4	ENG 101
Humanities (6 credits) (Courses from two different disciplines) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	6	(Choose statement 1, 2 or 3) Choose course(s) from the University Approved GEP course list for this category.
Social Sciences (6 credits) (Courses from two different disciplines) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	3	(Choose statement 1, 2 or 3) Major/College course requirement satisfies 3 credit hrs of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category.
Additional Breadth (3 credits) (Choose approach that is different from the approach of the Major) Major/College requirements cannot satisfy this requirement and an AB course cannot be double-counted except in satisfying the Global Knowledge or U.S. Diversity co-requisites.	3	(Choose statement 5 or 6) Choose course(s) from the University Approved GEP course list for this category.
Interdisciplinary Perspectives (5 credits) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	3	(Choose statement 1, 2 or 3) Major/College course requirement satisfies 2 credit hrs of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category.
Health and Exercise Studies (2 credits) (Including one Fitness and Wellness course)	2	Choose course(s) from the University Approved GEP course list for this category.
Total credit hours needed to complete GEP that are not satisfied as part of the Major/College requirements.	21 hours	

GEP Co-Requisites:			<i>Courses taken in the Major, GEP, or Minor may double-count to fulfill the co-requisites. Courses that satisfy the U.S. Diversity or Global Knowledge co-requisite are marked on course lists with a "USD" or "GK" indicator.</i>
U.S. Diversity co-requisite	(USD)	n/a	<i>(Choose statement 1 or 4)</i>
Global Knowledge co-requisite	(GK)	n/a	<i>(Choose statement 1 or 4)</i>
Foreign Language Proficiency		n/a	Proficiency at the FL_102 level required.
The following requirements must be satisfied within the College/Program:			Place an X in the credit hour box to indicate below that the requirement is "Satisfied by College/Program Requirements"
Communication in the Major (Advanced Communication)		n/a	Satisfied by College/Program Requirements
Technology Fluency		n/a	Satisfied by College/Program Requirements
Total credit hours required to complete Degree: Total must be within 120-128 credit hours.		126 Total Hours	As applicable, indicate here the overall GPA requirement for degree completion including course completion.

Type of Action: Enter "X" for Action Type(s) and list Title and Prefix(s) as indicated

_____ New Minor / Concentration
Proposed Minor / Concentration Title _____

_____ Change in Minor / Concentration Title

Current Minor / Concentration Title: _____

Proposed Minor / Concentration Title: _____

___X___ Change in Curricular/Program Requirements

Proposed Effective Date: August 2021 Program Contact: Bill Fortney (wbfortne@ncsu.edu)

Proposed CIP Code (see <https://nces.ed.gov/ipeds/cipcode/default.aspx?y=55>): 14.1901

Routing of Action: Indicate date when the following occurs

Completed Proposal

_____ Department Head endorses*
_____ College Curriculum Committee (undergraduate or graduate) recommends*
_____ College Dean endorses*

Proposal moves to Undergraduate or Graduate office for routing

_____ Recommended by Vice Provost, DELTA, if applies*
_____ Associate Deans Council **or** Graduate Operations Council informed
_____ University Courses & Curriculum Committee **or** Administrative Board of the Graduate
School recommends
_____ Dean (Graduate School or DASA) approves*

* Signature is required on the signature page for the action

MEMORANDUM

Date: February 23, 2021
To: Dr. Bret Smith, Interim Dean for Division of Academic and Student Affairs
From: Bill Fortney, Ph.D.
Director, Havelock site-based BSE program
Subject: Degree Revision for 14EGRBS-14EGRMES Engineering (BS): Mechanical Engineering Systems concentration

For the past year, the MES Continuous Improvement Committee has reviewed the program curriculum to ensure it continues to meet the program's educational objectives. Assessment results were reviewed, and feedback from the program constituents, including current students, alumni, and employers, was considered. Proposed curriculum changes were developed and reviewed by current students, alumni, and the MES Continuous Improvement committee. All groups agreed that the proposed changes were needed and would allow the program to meet the students and employers' needs better.

The proposed changes will take effect fall 2021 with incoming sophomores.

None of the changes will negatively impact existing MES students. Current MES students have the option to remain in their existing curriculum or switch to the proposed curriculum. Most current students and entering students have been aware of the potential changes and have taken courses accordingly.

None of the changes negatively impact ABET requirements for depth of study for Math and Basic Sciences, Engineering Topics, and General Education.

Some proposed changes impact the Computer Science department, and upon consultation, they are OK with these changes (see documentation below).

Effective August 2021, the revisions listed below are requested for the B.S. in Engineering – Mechanical Engineering Systems concentration, 14EGRBS-14EGRMES.

Proposed Revisions:

A summary of the proposed changes is given below.

Update Course Number

- Change MAE 415 to MAE 413

Change Semester Course Offered / Adjust Semester Hours

- Remove MES 300 from fall Junior and move to spring Junior – note hours also change from 4 to 3 due to a previous course revision
- Remove ECE 331 from spring junior and move to spring senior
- Remove ENG 331 from spring junior and move to fall junior
- Remove GEP Social Science from spring senior and move to fall senior

- Change total hours for fall junior from 15 to 14
- Change total hours for spring from 17 to 14
- Change total hours for fall senior from 14 to 17
- Change Minimum Credit Hours Required for Graduation from 125 to 124

Change Courses in Curriculum

- Remove ST 370 from spring sophomore and add MA 305 to spring freshman
- Remove CSC 112/114 from spring freshman and add CSC 111/113/116 to spring sophomore

Justification

Change MAE 415 to MAE 413

Change to reflect change in course number by MAE.

Change Semester Course Offered / Adjust Semester Hours

All changes in this section were made to better balance the student workload from semester to semester. Student feedback has consistently been that the fall junior semester is a very challenging course load with the MES 300 design project and other courses. The proposed sequence was developed by working with upper-level students and alumni and will create a more even workload. The semester hours were changed to match the new sequence of courses and the hour drop in the Minimum Credit Hours Required for Graduation is due to the course revision of MES 300 moving from 4 credit hours to 3 credit hours.

Change Courses in Curriculum

Remove ST 370 from spring sophomore and add MA 305 to spring freshman

During the last two assessment cycles, a weakness was identified related to differential equations in MES 301. After investigation, it is believed that a better foundation in matrix math will help with this weakness and other courses.

Feedback from students supported the theory, and the decision was made to add a course in linear algebra (MA 305). To keep from increasing total program hours, ST 370 will be dropped. The faculty believe that students receive the needed statistical background in the MES lab courses, and student and alumni feedback supports this.

Remove CSC 112/114 from spring freshman and add CSC 111/113/116 to spring sophomore

CSC 112 and CSC 114 are no longer offer. To satisfy the computer science needs in the program, students will be allowed to take CSC 111 (PYTHON), CSC 113 (MATLAB), or CSC 116 (JAVA). The preferred course for MES students is CSC 113, and students will be advised to take this course. The other course options will give students the structured programming concepts necessary and provide opportunities when CSC 113 is not available to our site-based students.

Statement of Impact on and Consultation with Other departments

The CSC department will be impacted since we are changing the computer science requirements. The department was consulted and has no problems with the proposed change (see next page).

Request Review of MES Curriculum Change for Impact on Your Department

Sarah Heckman <sarah_heckman@ncsu.edu>
To: Bill Fortney <wbfortne@ncsu.edu>
Cc: Michelle Pitman <mspitman@ncsu.edu>

Thu, Feb 18, 2021 at 10:13 AM

Bill,

CSC is ok with the proposed changes.

Sarah

On Tue, Feb 16, 2021 at 4:06 PM Bill Fortney <wbfortne@ncsu.edu> wrote:

Hi Sarah,

The MES Program is currently doing a curriculum revision and we want to clean up our computer science requirement.

Currently, our curriculum requires C++ or Fortran, and as you know, the C++ course no longer exists in the Course Catalog, and Fortran is no longer offered.

We would like to change our computer science requirement to
CSC 111 Python, or
CSC 113 MATLAB, or
CSC 116 Java.

If CSC 113 can be offered to our students every spring, we will advise all of our students to take this course in the spring of their sophomore year. In the event CSC 113 cannot be offered to our students, they can still learn the structured programming concepts needed by taking Python (CSC 111) or Java (CSC 116) through NC State or as a transfer course from a North Carolina Community College (CSC 121 for CSC 111 and CSC 151 for CSC 116).

I understand that CSC 111 is currently not offered in a way such that our students could take it from NC State and that I would have to coordinate with Engineering Online for our students to have access to the CSC 116 course.

Are you OK with our proposed change?

Thank you

The addition of MA 305 will not impact the Raleigh math department because MES students take the community college equivalent course (MAT 280) from their local community college. The MES staff has coordinated with the community college on this change and they are more than willing to support it. MAT 280 will be offered each spring to accommodate students at Craven Community College and each summer to accommodate students transferring from a school where the course was not available.

Proposed Changes in Format A and Format B

The current Format A display with changes marked, proposed Format A, Format B display with changed marked, and proposed Format B follows.

GEP FORMAT A – Marked Up Version
(SEMESTER-BY-SEMESTER CURRICULUM DISPLAY)

Display Status: Current: Proposed: X
Degree Plan Title: **Bachelor of Science in Engineering**
Plan SIS Code: **14EGRBS**
New Degree Audit Required?: **Yes**
Critical Path noted with CP by hours

Effective Semester: Fall **2021**
Concentration/Subplan Title: **Mechanical Engineering Systems**
Subplan SIS Code: **14EGRMES**

FRESHMAN YEAR

<u>Fall Semester</u>		<u>Credits</u>	<u>Spring Semester</u>		<u>Credits</u>
CH 101	Chemistry – A Molecular Science ^{B, 4}	3	CSC 112/114 C++ or FORTRAN		3
CH 102	General Chemistry Laboratory ^{B, 4}	1	MA 241	Analytic Geometry & Calculus II ^{A, 4}	4
E 101	Intro. to Engineering & Prob. Solving ¹	1	PY 205	Physics for Engineers. & Sci. I ^{B, 4}	3
ENG 101	Academic Writing and Research ^{1, H}	4	PY 206	Physics for Engineers. & Sci. I Lab	1
MA 141	Analytic Geometry & Calculus I ^{A, J, 4}	4	Physical Education/Healthy Living Elective ^E		1
GC 120	Foundations of Graphics	<u>3</u>	PE 1XX	Fitness and Wellness Course ^E	1
		16	EC 205	Fundamentals. of Economics ^D	3
			MA 305	Linear Algebra	3
					16

SOPHOMORE YEAR

<u>Fall Semester</u>		<u>Credits</u>	<u>Spring Semester</u>		<u>Credits</u>
MAE 206	Engr. Mechanics – Statics ^{1, 2}	3(CP)	MAE 208	Engr. Mechanics – Dynamics ^{1, 2}	3(CP)
MSE 201	Mech. Prop. of Structural Materials	3	MAE 214	Solid Mechanics ¹	3(CP)
MA 242	Calculus III	4	MA 341	Applied Diff. Equations	3
PY 208	Physics Engr. & Sci. II ^B	3	ST 370	Probability & Statistics for Engineers	3
PY 209	Physics Engr. & Sci. II Lab	1	MES 201	MES Lab I	2
MES 200	Intro to Mechanical Engineering Systems	<u>2</u>	CSC 111/113/116 Python, MATLAB or Java		3
		16	*** ****	GEP – Ethics ^{C, 3}	<u>3</u>
					17

JUNIOR YEAR

<u>Fall Semester</u>		<u>Credits</u>	<u>Spring Semester</u>		<u>Credits</u>
MAE 201	Engr Thermodynamics I ¹	3(CP)	MAE 316	Strength of Mech. Components	3
MAE 308	Fluid Mechanics	3	ECE 331	Principles of Electrical Engineering-I	3
MAE 315	Dynamics of Machines	3	ENG 331	Communication for Engineering & Tech-I	3
MES 300	Systems Engineering	4	MES 300	Systems Engineering	3**
MES 301	MES Lab II	2	MAE 435	Principles of Automatic Controls	3
ENG 331	Communication for Engineering & Tech	3	MES 302	MES Lab III	2
		14 15	GEP Additional Breadth Requirement ^F (Hum/SS/VPA)		<u>3</u>
					14 17

**Hour change to match course revision.

SENIOR YEAR

<u>Fall Semester</u>		<u>Credits</u>	<u>Spring Semester</u>		<u>Credits</u>
MAE 413 445	Mech. Engr. Analysis ¹	3	MAE 412	Analysis & Design of Energy Systems ¹	3
MAE 310	Heat Transfer	3	MES 403	Capstone Design II	3
MES 401	Capstone Design I	3	ECE 331	Principles of Elec. Engr. I	3
MES 400	MES Lab IV	2	GEP Interdisciplinary Perspectives Requirement ^G		3
GEP Humanities Requirement ^C		3	GEP Interdisciplinary Perspectives Requirement ^G		2 or 3
GEP Social Science Requirement ^D		<u>3</u>	GEP Social Science Requirement ^D		<u>3</u>
		17 14			14 or 15

Minimum Credit Hours Required for Graduation* I, J, K = 124~~125~~

Major/Program requirements and footnotes:

¹Minimum grade of C-

²Students must have a 2.5 to enroll in this course.

³Select from PHI 214, PHI 221 or PHI 375.

⁴Grade of C (2.0) or higher required.

***General Education Program (GEP) requirements and GEP footnotes:**

To complete the requirements for graduation and the General Education Program, the following category credit hours and co-requisites must be satisfied.

University approved GEP course lists for each of the following categories can be found at <http://www.ncsu.edu/uap/academic-standards/gep/courselists/index.html>.

- A. Mathematical Sciences** (6 credit hours – one course with MA or ST prefix)
*Choose from the University approved GEP Mathematical Sciences course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: **MA 141,241***
- B. Natural Sciences** (7 credit hours – include one laboratory course or course with a lab)
*Choose from the University approved GEP Natural Sciences course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: **CH 101, 102, 201, 202, PY 205, 208***
- C. Humanities** (6 credit hours selected from two different disciplines/course prefixes)
*Choose from the University approved GEP Humanities course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: **PHI 214, PHI 221, PHI 375***
- D. Social Sciences** (6 credit hours selected from two different disciplines/course prefixes)
*Choose from the University approved GEP Social Sciences course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: **EC 205***
- E. Physical Education/Healthy Living** (2 credit hours – at least one 100-level Fitness and Wellness Course)
Choose from the University approved GEP Physical Education/Healthy Living course list.
- F. Additional Breadth** - (3 credit hours to be selected from the following checked University approved GEP course lists)
☒ **X** Humanities/Social Sciences/Visual and Performing Arts or ☐ Mathematical Sciences/Natural Sciences/Engineering
- G. Interdisciplinary Perspectives** (5-6 credit hours)
*Choose from University approved GEP Interdisciplinary Perspectives course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: **None***
- H. Introduction to Writing** (4 credit hours satisfied by completing **ENG 101** with a C- or better)

The following Co-Requisites must be satisfied to complete the General Education Program requirements:

- I. U.S. Diversity**
*Choose from the University approved GEP U.S. Diversity course list or choose a course identified on the approved GEP course lists as meeting the U.S. Diversity (USD) co-requisite. The following course(s) if completed as part of the Major requirements may fulfill this requirement: **None***
- J. Global Knowledge**
*Choose from the University approved GEP Global Knowledge course list or choose a course identified on the approved GEP course lists as meeting the Global Knowledge (GK) co-requisite. The following course(s) if completed as part of the Major requirements may fulfill this requirement: **None***
- K. Foreign Language proficiency** - Proficiency at the **FL_102** level is required for graduation.

GEP FORMAT A
(SEMESTER-BY-SEMESTER CURRICULUM DISPLAY)

Display Status: Current: Proposed: X

Degree Plan Title: **Bachelor of Science in Engineering**

Plan SIS Code: **14EGRBS**

New Degree Audit Required?: **Yes**

Critical Path noted with CP by hours

Effective Semester: **Fall 2021**

Concentration/Subplan Title: **Mechanical Engineering Systems**

Subplan SIS Code: **14EGRMES**

FRESHMAN YEAR

<u>Fall Semester</u>		<u>Credits</u>	<u>Spring Semester</u>		<u>Credits</u>
CH 101	Chemistry – A Molecular Science ^{B, 4}	3	MA 241	Analytic Geometry & Calculus II ^{A, 4}	4
CH 102	General Chemistry Laboratory ^{B, 4}	1	PY 205	Physics for Engineers. & Sci. I ^{B, 4}	3
E 101	Intro. to Engineering & Prob. Solving ¹	1	PY 206	Physics for Engineers. & Sci. I Lab	1
ENG 101	Academic Writing and Research ^{1, H}	4	Physical Education/Healthy Living Elective ^E		1
MA 141	Analytic Geometry & Calculus I ^{A, J, 4}	4	PE 1XX	Fitness and Wellness Course ^E	1
GC 120	Foundations of Graphics	<u>3</u>	EC 205	Fundamentals. of Economics ^D	3
		16	MA 305	Linear Algebra	<u>3</u>
					16

SOPHOMORE YEAR

<u>Fall Semester</u>		<u>Credits</u>	<u>Spring Semester</u>		<u>Credits</u>
MAE 206	Engr. Mechanics – Statics ^{1, 2}	3(CP)	MAE 208	Engr. Mechanics – Dynamics ^{1, 2}	3(CP)
MSE 201	Mech. Prop. of Structural Materials	3	MAE 214	Solid Mechanics ¹	3(CP)
MA 242	Calculus III	4	MA 341	Applied Diff. Equations	3
PY 208	Physics Engr. & Sci. II ^B	3	MES 201	MES Lab I	2
PY 209	Physics Engr. & Sci. II Lab	1	CSC 11/113/116 Python, MATLAB or Java		3
MES 200	Intro to Mechanical Engineering Systems	<u>2</u>	*** ****	GEP – Ethics ^{C, 3}	<u>3</u>
		16			17

JUNIOR YEAR

<u>Fall Semester</u>		<u>Credits</u>	<u>Spring Semester</u>		<u>Credits</u>
MAE 201	Engr Thermodynamics I ¹	3(CP)	MAE 316	Strength of Mech. Components	3
MAE 308	Fluid Mechanics	3	MES 300	Systems Engineering	3
MAE 315	Dynamics of Machines	3	MAE 435	Principles of Automatic Controls	3
MES 301	MES Lab II	2	MES 302	MES Lab III	2
ENG 331	Communication for Engineering & Tech	<u>3</u>	GEP Additional Breadth Requirement ^F (Hum/SS/VPA)		<u>3</u>
		14			14

SENIOR YEAR

<u>Fall Semester</u>		<u>Credits</u>	<u>Spring Semester</u>		<u>Credits</u>
MAE 413	Mech. Engr. Analysis ¹	3	MAE 412	Analysis & Design of Energy Systems ¹	3
MAE 310	Heat Transfer	3	MES 403	Capstone Design II	3
MES 401	Capstone Design I	3	ECE 331	Principles of Elec. Engr. I	3
MES 400	MES Lab IV	2	GEP Interdisciplinary Perspectives Requirement ^G		3
GEP Humanities Requirement ^C		3	GEP Interdisciplinary Perspectives Requirement ^G		<u>2 or 3</u>
GEP Social Science Requirement ^D		<u>3</u>			14 or 15
		17			

Minimum Credit Hours Required for Graduation* I, J, K = 124

Major/Program requirements and footnotes:

¹Minimum grade of C-

²Students must have a 2.5 to enroll in this course.

³Select from PHI 214, PHI 221 or PHI 375.

⁴Grade of C (2.0) or higher required.

***General Education Program (GEP) requirements and GEP footnotes:**

To complete the requirements for graduation and the General Education Program, the following category credit hours and co-requisites must be satisfied.

University approved GEP course lists for each of the following categories can be found at <http://www.ncsu.edu/uap/academic-standards/gep/courselists/index.html>.

- A. **Mathematical Sciences** (6 credit hours – one course with MA or ST prefix)
*Choose from the University approved GEP Mathematical Sciences course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: **MA 141, 241***
- B. **Natural Sciences** (7 credit hours – include one laboratory course or course with a lab)
*Choose from the University approved GEP Natural Sciences course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: **CH 101, 102, 201, 202, PY 205, 208***
- C. **Humanities** (6 credit hours selected from two different disciplines/course prefixes)
*Choose from the University approved GEP Humanities course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: **PHI 214, PHI 221, PHI 375***
- D. **Social Sciences** (6 credit hours selected from two different disciplines/course prefixes)
*Choose from the University approved GEP Social Sciences course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: **EC 205***
- E. **Physical Education/Healthy Living** (2 credit hours – at least one 100-level Fitness and Wellness Course)
Choose from the University approved GEP Physical Education/Healthy Living course list.
- F. **Additional Breadth** - (3 credit hours to be selected from the following checked University approved GEP course lists)
☒ **X** Humanities/Social Sciences/Visual and Performing Arts or ☐ Mathematical Sciences/Natural Sciences/Engineering
- G. **Interdisciplinary Perspectives** (5-6 credit hours)
*Choose from University approved GEP Interdisciplinary Perspectives course list or the following course(s) if completed as part of the Major requirements may fulfill part or all of this requirement: **None***
- H. **Introduction to Writing** (4 credit hours satisfied by completing **ENG 101** with a C- or better)

The following Co-Requisites must be satisfied to complete the General Education Program requirements:

- I. **U.S. Diversity**
*Choose from the University approved GEP U.S. Diversity course list or choose a course identified on the approved GEP course lists as meeting the U.S. Diversity (USD) co-requisite. The following course(s) if completed as part of the Major requirements may fulfill this requirement: **None***
- J. **Global Knowledge**
*Choose from the University approved GEP Global Knowledge course list or choose a course identified on the approved GEP course lists as meeting the Global Knowledge (GK) co-requisite. The following course(s) if completed as part of the Major requirements may fulfill this requirement: **None***
- K. **Foreign Language proficiency** - Proficiency at the **FL_102** level is required for graduation.

<u>Degree/Plan Title:</u> Bachelor of Science in Engineering		<u>Plan SIS Code:</u> 14EGRBS
Concentration/Subplan Title: Mechanical Engineering Systems		Subplan SIS Code: 14EGRMES
<u>Indicate requirements status:</u>	Current: Proposed: X	<u>Proposed</u> Effective Semester: Fall 2017 <u>2021</u>
<u>New Degree Audit required?</u> (Y or N) Y		
<u>Critical Path Courses</u> - Identify using the code (CP) which courses are considered critical path courses which represent specific major requirements that are predictive of student success in a given program/plan. Place the (CP) next to the credit hours for the course.		

MAJOR FIELD OF STUDY REQUIREMENTS:		
Required Courses/Groups/ Electives:	Credit Hours	GEP category, if applicable
Indicate if course or course groupings have a C-wall or MGPA requirement and which are considered Critical Path courses – indicate with (CP) next to applic. course.		List GEP category and hours satisfied by a Major requirement
Math		
MA 141(C-), MA 241(C-), MA 242	12	Mathematics (6 hours)
Differential Equations (MA 341)	3	
<u>Linear Algebra (MA 305)</u>	<u>3</u>	
Sciences		
CH 101 (C-), CH 102(C-)	4	Natural Sciences (4 hours)
PY 205 (C-), PY 206 (C-), PY 208 (C-), PY 209 (C-)	8	Natural Sciences (4 hours)
Major		
MAE 206 (C-)	3 <u>(CP)</u>	
MAE 208 (C-)	3 <u>(CP)</u>	
MAE 214 (C-)	3 <u>(CP)</u>	
MAE 201(C-)	3 <u>(CP)</u>	
MAE 308	3	
MAE 310	3	
MAE 315	3	
MAE 316	3	
MAE 412 <u>(C-)</u>	3	
MAE 415 <u>413(C-)</u>	3	
MAE 435	3	
MES 200	2	Technology Fluency
MES 201	2	
MES 300	4 <u>3</u>	
MES 301	2	
MES 302	2	
MES 400	2	
MES 401	3	
MES 403	3	
Other Major		
(CSC 112 <u>111</u> or CSC 114 <u>113</u> or CSC 116)	3	
GC 120	3	
ECE 331	3	
ENG 331	3	Communication in the major co-requisite
MSE 201	3	
ST 370	3	Humanities or Interdisciplinary Perspectives
Engineering Ethics (PHI 214, PHI 221 or PHI 375)	3	

Concentration Courses/Groups/Electives:	0	
Free Electives:	0	
Total credit hours under Major Field of Study: <i>Minimum 27 hours required in program area.</i>	101 100 hours	
COLLEGE REQUIREMENTS:		
Orientation Course(s): E 101	1	
Other: Economics Elective (EC 205, 201; ARE 201)	3	Social Sciences
Total credit hours under College Requirements:	4 Hours	

NCSU GENERAL EDUCATION PROGRAM REQUIREMENTS <i>Courses in the Major and/or Minor may also fulfill a General Education requirement; however, a GEP category <u>may not be subset</u> to require a specific course from the category list. Required courses must be listed in the Major/College requirements.</i> <i>Specific courses should not be listed in any of the fields below other than ENG 101.</i>		At least one of the following must be listed: 1 Choose course(s) from the University Approved GEP course list for this category. 2 Minimum requirements are satisfied by Major/College course requirements. 3 Major/College course requirement satisfies X credit hrs of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category. 4 Co-requisite is satisfied by a Major/College course requirement. 5 Choose course(s) from the University Approved GEP course lists for the Humanities/ Social Sciences/ Visual & Performing Arts. 6 Choose course(s) from the University Approved GEP course lists for Natural Sciences/Mathematical Sciences.
General Education Program Requirements: <i>Minimum 39-40 hrs</i>	Credit hours	How will the GEP requirement be met? (Choose applicable statement from 1-6 listed above)
Mathematical Sciences (6 credits) (At least 1 course with MA or ST prefix) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	X	(Choose statement 1, 2 or 3) Minimum requirements are satisfied by Major course requirements
Natural Sciences (7 credits) (At least 1 lab course or course with a lab) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	X	(Choose statement 1, 2 or 3) Minimum requirements are satisfied by Major course requirements
English 101 (C- or better required) (4 credits)	4	ENG 101
Humanities (6 credits) (Courses from two different disciplines) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	3	(Choose statement 1, 2 or 3) College course requirement satisfies 3 credit hrs of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category.
Social Sciences (6 credits) (Courses from two different disciplines) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	3	(Choose statement 1, 2 or 3) College course requirement satisfies 3 credit hrs of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category.
Additional Breadth (3 credits) (Choose approach that is different from the approach of the Major) Major/College requirements cannot satisfy this requirement and an AB course cannot be double-counted except in satisfying the Global Knowledge or U.S. Diversity co-requisites.	3	(Choose statement 5 or 6) Choose course(s) from the University Approved GEP course lists for the Humanities/ Social Sciences/ Visual & Performing Arts
Interdisciplinary Perspectives (5 credits) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	5	(Choose statement 1, 2 or 3) Choose course(s) from the University Approved GEP course list for this category
Health and Exercise Studies (2 credits) (Including one Fitness and Wellness course)	2	Choose course(s) from the University Approved GEP course list for this category.
Total credit hours needed to complete GEP that are <u>not</u> satisfied as part of the Major/College requirements.	20 hours	

GEP Co-Requisites:			<i>Courses taken in the Major, GEP, or Minor may double-count to fulfill the co-requisites. Courses that satisfy the U.S. Diversity or Global Knowledge co-requisite are marked on course lists with a "USD" or "GK" indicator.</i>
U.S. Diversity co-requisite	(USD)	n/a	(Choose statement 1 or 4) Choose course(s) from the University Approved GEP course list for this category
Global Knowledge co-requisite	(GK)	n/a	(Choose statement 1 or 4) Choose course(s) from the University Approved GEP course list for this category
Foreign Language Proficiency		n/a	Proficiency at the FL_102 level required.
The following requirements must be satisfied within the College/Program:			Place an X in the credit hour box to indicate below that the requirement is "Satisfied by College/Program Requirements"
Communication in the Major (Advanced Communication)		X	Satisfied by <u>College</u> /Program Requirements
Technology Fluency		X	Satisfied by <u>College</u> /Program Requirements (MES 200)
Total credit hours required to complete Degree: Total must be within 120-128 credit hours.	125 <u>124</u> Total hours	As applicable, indicate here the overall GPA requirement for degree completion including course completion.	

CURRICULUM REQUIREMENTS

Format B

<u>Degree/Plan Title:</u> Bachelor of Science in Engineering	<u>Plan SIS Code:</u> 14EGRBS
Concentration/Subplan Title: Mechanical Engineering Systems	Subplan SIS Code: 14EGRMES
<u>Indicate requirements status:</u> Current: Proposed: X <u>Proposed Effective Semester:</u> Fall 2021	
<u>New Degree Audit required?</u> (Y or N) Y	
<u>Critical Path Courses</u> - Identify using the code (CP) which courses are considered critical path courses which represent specific major requirements that are predictive of student success in a given program/plan. Place the (CP) next to the credit hours for the course.	

MAJOR FIELD OF STUDY REQUIREMENTS:		
<i>Required Courses/Groups/ Electives:</i>	<i>Credit Hours</i>	<i>GEP category, if applicable</i>
Indicate if course or course groupings have a C-wall or MGPA requirement and which are considered Critical Path courses – indicate with (CP) next to applic. course.		List GEP category and hours satisfied by a Major requirement
<u>Math</u> MA 141(C-), MA 241(C-), MA 242 Differential Equations (MA 341) Linear Algebra (MA 305)	12 3 3	Mathematics (6 hours)
<u>Sciences</u> CH 101 (C-), CH 102(C-) PY 205 (C-), PY 206 (C-), PY 208 (C-), PY 209 (C-)	4 8	Natural Sciences (4 hours) Natural Sciences (4 hours)
<u>Major</u> MAE 206 (C-) MAE 208 (C-) MAE 214 (C-) MAE 201(C-) MAE 308 MAE 310 MAE 315 MAE 316 MAE 412(C-) MAE 413(C-) MAE 435 MES 200 MES 201 MES 300 MES 301 MES 302 MES 400 MES 401 MES 403	3 (CP) 3 (CP) 3 (CP) 3 (CP) 3 3 3 3 3 3 3 2 2 3 2 2 2 2 3 3	
<u>Other Major</u> (CSC 111 or CSC 113 or CSC 116) GC 120 ECE 331 ENG 331 MSE 201 Engineering Ethics (PHI 214, PHI 221 or PHI 375)	3 3 3 3 3 3	Communication in the major co-requisite Humanities

Concentration Courses/Groups/Electives:	0	
Free Electives:	0	
Total credit hours under Major Field of Study: <i>Minimum 27 hours required in program area.</i>	100 hours	
COLLEGE REQUIREMENTS:		
Orientation Course(s): E 101	1	
Other: Economics Elective (EC 205, 201; ARE 201)	3	Social Sciences
Total credit hours under College Requirements:	4 Hours	

NCSU GENERAL EDUCATION PROGRAM REQUIREMENTS <i>Courses in the Major and/or Minor may also fulfill a General Education requirement; however, a GEP category may not be subset to require a specific course from the category list. Required courses must be listed in the Major/College requirements.</i> <i>Specific courses should not be listed in any of the fields below other than ENG 101.</i>		At least one of the following must be listed: 1 Choose course(s) from the University Approved GEP course list for this category. 2 Minimum requirements are satisfied by Major/College course requirements. 3 Major/College course requirement satisfies <u>X</u> credit hrs of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category. 4 Co-requisite is satisfied by a Major/College course requirement. 5 Choose course(s) from the University Approved GEP course lists for the Humanities/ Social Sciences/ Visual & Performing Arts. 6 Choose course(s) from the University Approved GEP course lists for Natural Sciences/Mathematical Sciences.
General Education Program Requirements: <i>Minimum 39-40 hrs</i>	Credit hours	How will the GEP requirement be met? (Choose applicable statement from 1-6 listed above)
Mathematical Sciences (6 credits) (At least 1 course with MA or ST prefix) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	X	(Choose statement 1, 2 or 3) Minimum requirements are satisfied by Major course requirements
Natural Sciences (7 credits) (At least 1 lab course or course with a lab) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	X	(Choose statement 1, 2 or 3) Minimum requirements are satisfied by Major course requirements
English 101 (C- or better required) (4 credits)	4	ENG 101
Humanities (6 credits) (Courses from two different disciplines) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	3	(Choose statement 1, 2 or 3) College course requirement satisfies <u>3</u> credit hrs of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category.
Social Sciences (6 credits) (Courses from two different disciplines) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	3	(Choose statement 1, 2 or 3) College course requirement satisfies <u>3</u> credit hrs of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category.
Additional Breadth (3 credits) (Choose approach that is different from the approach of the Major) Major/College requirements cannot satisfy this requirement and an AB course cannot be double-counted except in satisfying the Global Knowledge or U.S. Diversity co-requisites.	3	(Choose statement 5 or 6) Choose course(s) from the University Approved GEP course lists for the Humanities/ Social Sciences/ Visual & Performing Arts
Interdisciplinary Perspectives (5 credits) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	5	(Choose statement 1, 2 or 3) Choose course(s) from the University Approved GEP course list for this category
Health and Exercise Studies (2 credits) (Including one Fitness and Wellness course)	2	Choose course(s) from the University Approved GEP course list for this category.
Total credit hours needed to complete GEP that are <u>not</u> satisfied as part of the Major/College requirements.	20 hours	

GEP Co-Requisites:			<i>Courses taken in the Major, GEP, or Minor may double-count to fulfill the co-requisites. Courses that satisfy the U.S. Diversity or Global Knowledge co-requisite are marked on course lists with a "USD" or "GK" indicator.</i>
U.S. Diversity co-requisite	(USD)	n/a	(Choose statement 1 or 4) Choose course(s) from the University Approved GEP course list for this category
Global Knowledge co-requisite	(GK)	n/a	(Choose statement 1 or 4) Choose course(s) from the University Approved GEP course list for this category
Foreign Language Proficiency		n/a	Proficiency at the FL_102 level required.
The following requirements must be satisfied within the College/Program:			Place an X in the credit hour box to indicate below that the requirement is "Satisfied by College/Program Requirements"
Communication in the Major (Advanced Communication)		X	Satisfied by College/Program Requirements
Technology Fluency		X	Satisfied by College/Program Requirements
Total credit hours required to complete Degree: Total must be within 120-128 credit hours.	124 Total hours		As applicable, indicate here the overall GPA requirement for degree completion including course completion.

North Carolina State University

This request has been reviewed and approved by the appropriate campus committees and authorities.

Completed Proposal

Endorsed By:

Bills Fortney

2/23/2021

Head, Department/Program

Date

Recommended By:

David W. Parish

2/26/2021

Chair, College Curriculum Committee

Date

Endorsed By:

Jerome P. Favelle

02/26/2021

College Dean

Date

Proposal moves to Undergraduate or Graduate office for routing

Recommended By:

Vice Provost, DELTA (if DE degree/certificate)

Date

Recommended By:

Chair, University Courses & Curricula Committee
or Administrative Board of the Graduate School

Date

Approved By:

Dean, DASA or the Graduate School

MEMO

To: University Courses and Curriculum Committee

From: Department of Materials Science and Engineering

Date: November 30, 2020

Subject: 14MSEBS, 14MSEBS-14MSEBIO, and 14MSEBS-14MSENANO Curriculum Action

Explanation: The purpose of the curriculum updates is to bring the Format A and B forms into alignment with the degree requirements as well as to update the list of elective course options.

Proposed Revisions with Reasons

Materials Science & Engineering (BS) - 14MSEBS

- I. **Revision:** Update the number of credits for CH 220: Introductory Organic Chemistry from 4 credits to 3 credits.
 - a. **Revision Reason:** CH 220 is a lecture course that is three credits, not four.
 - b. **Format A:** Sophomore Year, Spring Semester
 - c. **Format B:** Required Courses – Sciences
- II. **Revision:** Change superscript from 2 to 1 for MSE 201
 - a. **Revision Reason:** Typo. MSE 201 is required for CODA with a letter grade of a C or better.
 - b. **Format A:** Sophomore year, Fall semester
 - c. **Format B:** N/A
- III. **Revision:** Add CH 222: Organic Chemistry I Lab (1 credit)
 - a. **Revision Reason:** CH 222 is the laboratory corequisite for CH 220/CH 221
 - b. **Format A:** Sophomore Year, Spring Semester
 - c. **Format B:** Required Courses - Sciences
- IV. **Revision:** Add CH 221: Organic Chemistry I (3 credits) as an alternative to CH 220
 - a. **Revision Reason:** CH 221 was added as an option for organic chemistry because CH 220 offerings became infrequent and often conflicted with a required MSE course.
 - b. **Format A:** Sophomore Year, Spring Semester
 - c. **Format B:** Required Courses – Sciences
- V. **Revision:** Ethics requirement to Format B under required courses: IDS 201, STS 302, STS 304, STS/PHI 325, PHI 214, PHI 221, or PHI 375. Satisfies 3 credits for either the Humanities or Interdisciplinary Perspective GEP Requirement. Update GEP Requirements to match. In Format A: Change wording for a GEP Requirement in semester-by-semester plan to say: Ethics Elective (GEP Requirement*)⁶. Add “PHI 214, PHI 221, PHI/STS 325, or PHI 375 taken as part of the Major requirements satisfies 3 credit hours of the 6 credit hours needed to fulfill the GEP Humanities requirement.” under Humanities GEP requirements. Add “IDS 201, STS 302, STS 304 or STS/PHI 325 taken as part of the Major requirements satisfies 3 credit hours of the 5 credit hours needed to fulfill the GEP Interdisciplinary Perspectives requirement.” under Interdisciplinary Perspective.
 - a. **Revision Reason:** There was no corresponding requirement in the semester-by-semester plan to go with the footnote. The Ethics requirement was not listed on Format B at all.
 - b. **Format A:** Senior Year, Spring Semester; GEP Requirements
 - c. **Format B:** Major Field of Study Requirements, Required Courses and General Education Program Requirements, Humanities and Interdisciplinary Perspectives

- VI. **Revision:** Add PY 206 (1 credit) and PY 209 (1 credit) as critical path courses in the Sciences under Major Field of Study Requirements on Format B.
- Revision Reason:** PY 206 and PY 209 are required labs that are corequisites for PY 205 and PY 209.
 - Format A:** correct on Format A
 - Format B:** Required Courses – Sciences
- VII. **Revision:** Add EC 201 and ARE 201 as equivalent course options for EC 205.
- Revision Reason:** EC 201 and ARE 201 are standard substitutions for EC 205
 - Format A:** Correct on Format A
 - Format B:** Required Courses – Sciences
- VIII. **Revision:** Update MSE Processing Electives: Add MSE 540, MSE 545, and MSE 556 and remove CH 455
- Revision Reason:** MSE 540, MSE 545, and MSE 556 are listed as MSE processing options in Degree Audit in MyPack Portal. CH 455 is no longer offered.
 - Format A:** Footnote 5
 - Format B:** MSE Processing Elective (GRP 080)
- IX. **Revision:** Add to Technical Electives: PY 511, PY 512, PY 514, and PY 515
- Revision Reason:** PY 511, PY 512, PY 514, and PY 515 are listed as technical electives in MyPack Portal.
 - Format A:** Footnote 4
 - Format B:** Technical Elective (GRP 071)
- X. **Revision:** Remove from Technical Electives: CH 221, PY 463, ST 370, CHE 455, MSE 440, MSE 445, MSE 455, MSE 456, and MSE 460.
- Revision Reason:** PY 463 is now only listed as MEA 463, CH 221 is a required course option, and ST 370 is a required course. The MSE courses have been moved to footnote 5 to separate out the MSE processing electives.
 - Format A:** Footnote 4
 - Format B:** Technical Elective (GRP 071)
- XI. **Revisions:** Add to the list of engineering electives: CSC 110, MSE(NE) 409/509, MSE 465, MSE 485, and MSE 565. Department approval is required for MSE 495.
- Revision Reason:** MSE (NE) 409/509, MSE 465, MSE 565, and MSE 485 are listed as engineering electives in the degree audit in MyPack Portal. CSC 110 is a standardly approved elective. MSE 495 is the credit course for MSE research project.
 - Format A:** Footnote 3
 - Format B:** Engineering Elective (GRP 061)
- XII. **Revisions:** Update Engineering Electives: Replace CE 313 with CE 225
- Revision Reason:** CE 313 is now numbered CE 225.
 - Format A:** Footnote 5
 - Format B:** Engineering Elective (GRP 061)
- XIII. **Revisions:** Remove from Engineering Electives: CE 215, CE 251, CHE 455, CSC 200, ISE/GC 210, MSE 350
- Revision Reason:** Courses are no longer offered.
 - Format A:** Footnote 5
 - Format B:** Engineering Elective (GRP 061)
- XIV. **Revision:** Add ENG 333 as substitution option for ENG 331 as technical writing course option
- Revision Reason:** ENG 333 is a standard substitution for ENG 331
 - Format A:** Correct
 - Format B:** College Requirements – Other

Impact on Other Departments: No impact as no additional courses are being added.

Impact on Current Students: No impact.

Materials Science & Engineering (BS): Biomaterials - 14MSEBS-14MSEBIO

- I. **Revision:** Add superscript “1” and “2” to E 101, E115 and ENG 101 on Format A. Update Footnote 1 wording to match 14MSEBS Format A: “Courses required for Change of Degree Audit (CODA). CH 101, 102; MA 141, 241; PY 205, 206 must be completed with a C or higher.”
 - a. **Revision Reason:** Courses are required for CODA
 - b. **Format A:** Freshman Year, Fall Semester
 - c. **Format B:** n/a
- II. **Revision:** Replace BME/MSE 203 with MSE 201
 - a. **Revision Reason:** BME/MSE 203 is no longer offered.
 - b. **Format A:** Sophomore Year, Fall Semester
 - c. **Format B:** Required Course
- III. **Revision:** Update the number of credits for CH 220: Introductory Organic Chemistry from 4 credits to 3 credits.
 - a. **Revision Reason:** CH 220 is a lecture course that is three credits, not four.
 - b. **Format A:** Sophomore Year, Spring Semester
 - c. **Format B:** Required Courses - Sciences
- IV. **Revision:** Add CH 222: Organic Chemistry I Lab (1 credit)
 - a. **Revision Reason:** CH 222 is the laboratory corequisite for CH 220/CH 221
 - b. **Format A:** Sophomore Year, Spring Semester
 - c. **Format B:** Required Courses - Sciences
- V. **Revision:** Add CH 221: Organic Chemistry I (3 credits) as an alternative to CH 220
 - a. **Revision Reason:** CH 221 was added as an option for organic chemistry because CH 220 offerings became infrequent and often conflicted with a required MSE course.
 - b. **Format A:** Sophomore Year, Spring Semester
 - c. **Format B:** Required Courses - Sciences
- VI. **Revision:** Remove superscript “IJK” from the minimum credit hours required for graduation.
 - a. **Revision Reason:** The university requirement is already written in the footnotes and the superscript is confusing.
 - b. **Format A:** Minimum credit hours required for graduation
 - c. **Format B:** n/a
- VII. **Revision:** Add EC 201 and ARE 201 as equivalent course options for EC 205.
 - a. **Revision Reason:** EC 201 and ARE 201 are standard substitutions for EC 205
 - b. **Format A:** Correct on Format A
 - c. **Format B:** Required Courses – Sciences
- VIII. **Revision:** Add ENG 333 as substitution option for ENG 331 as technical writing course option
 - a. **Revision Reason:** ENG 333 is a standard substitution for ENG 331
 - b. **Format A:** Correct on Format A
 - c. **Format B:** College Requirements – Other
- IX. **Revision:** Update footnote numbers in order to add a footnote with the list of biomaterials concentration electives.
 - a. **Revision Reason:** Include the list of approved biomaterials concentration courses
 - b. **Format A:** Senior Year, Fall and Spring Semesters, Footnotes 3-6
 - c. **Format B:** n/a
- X. **Revision:** Update biomaterials electives: Choose any course from the following list of biomaterials concentration electives: BCH 351, BCH 451, BEC (CHE) 462/562, BEC (CHE) 488/588, BIO 414, BIT 410, BIT (PO) 466/566, BME (TE) 466/566, BME (TE) 467, BME (BEC) 483/583, MT 323, MT 366, MT 432, MT (PCC) 471, PSE 332, PSE (CH) 335, PSE 425. Additional biomaterials concentration electives may be approved by the MSE Director of Undergraduate Programs. Only 1 advisor approved MSE 490 (special topics) course may be used to fulfill a biomaterials concentration elective. Departmental approval is required for MSE 495. Remove BME 462.
 - a. **Revision Reason:** The list of approved biomaterials concentration courses was not previously written in Format A. The list of courses was taken from the degree audit in MyPack Portal and the Format B form. BME 462 is no longer offered.
 - b. **Format A:** Footnotes 3
 - c. **Format B:** Biomaterials Concentration Elective

- XI. **Revision:** Update MSE Processing Electives: Add MSE 540, MSE 545, and MSE 556. Remove the sentence “This elective may be taken in the spring or fall semester by swapping it with a Technical Elective.”
- Revision Reason:** MSE 540, MSE 545, and MSE 556 are listed as MSE processing options in Degree Audit in MyPack Portal. Remove the sentence because it is confusing.
 - Format A:** Footnote 5
 - Format B:** MSE Processing Elective (GRP 080)
- XII. **Revision:** Ethics requirement to Format B under required courses: IDS 201, STS 302, STS 304, STS/PHI 325, PHI 214, PHI 221, or PHI 375. Satisfies 3 credits for either the Humanities or Interdisciplinary Perspective GEP Requirement. Update GEP Requirements to match. In Format A: Add “PHI 214, PHI 221, PHI/STS 325, or PHI 375 taken as part of the Major requirements satisfies 3 credit hours of the 6 credit hours needed to fulfill the GEP Humanities requirement.” under Humanities GEP requirements. Add “IDS 201, STS 302, STS 304 or STS/PHI 325 taken as part of the Major requirements satisfies 3 credit hours of the 5 credit hours needed to fulfill the GEP Interdisciplinary Perspectives requirement.” under Interdisciplinary Perspective.
- Revision Reason:** There was no corresponding requirement in the semester-by-semester plan to go with the footnote. The Ethics requirement was not listed on Format B at all.
 - Format A:** GEP Requirements
 - Format B:** Major Field of Study Requirements, Required Courses and General Education Program Requirements, Humanities and Interdisciplinary Perspectives

Impact on Other Departments: No impact as no additional courses are being added.

Impact on Current Students: No impact.

Materials Science & Engineering (BS): Nanomaterials - 14MSEBS-14MSENANO

- XIII. **Revision:** Add superscript “1” and “2” to E 101, E115 and ENG 101 on Format A. Update Footnote 1 wording to match 14MSEBS Format A: “Courses required for Change of Degree Audit (CODA). CH 101, 102; MA 141, 241; PY 205, 206 must be completed with a C or higher.”
- Revision Reason:** Courses are required for CODA
 - Format A:** Freshman Year, Fall Semester
 - Format B:** n/a
- II. **Revision:** Update the number of credits for CH 220: Introductory Organic Chemistry from 4 credits to 3 credits.
- Revision Reason:** CH 220 is a lecture course that is three credits, not four.
 - Format A:** Sophomore Year, Spring Semester
 - Format B:** Required Courses - Sciences
- III. **Revision:** Add CH 222: Organic Chemistry I Lab (1 credit)
- Revision Reason:** CH 222 is the laboratory corequisite for CH 220/CH 221
 - Format A:** Sophomore Year, Spring Semester
 - Format B:** Required Courses - Sciences
- IV. **Revision:** Add CH 221: Organic Chemistry I (3 credits) as an alternative to CH 220
- Revision Reason:** CH 221 was added as an option for organic chemistry because CH 220 offerings became infrequent and often conflicted with a required MSE course.
 - Format A:** Sophomore Year, Spring Semester
 - Format B:** Required Courses - Sciences
- V. **Revision:** Update wording from “Technical or Nanomaterials Elective” to “Technical Elective^{3,5,6,7” in the Junior year, Fall semester and “Nanomaterials Elective^{3,4” in the Senior year fall and spring semesters}}
- Revision Reason:** The change makes it easier to understand the number of technical and nanomaterials electives needed and aligns better with the Biomaterials concentration Format A form.
 - Format A:** Junior year, fall semester; Senior year, fall and spring semesters
 - Format B:** n/a
- VI. **Revision:** Remove superscript “IJK” from the minimum credit hours required for graduation.
- Revision Reason:** The university requirement is already written in the footnotes and the superscript is confusing.
 - Format A:** Minimum credit hours required for graduation

c. **Format B:** n/a

- VII. **Revision:** Update footnote numbers on Format A form in order to separate out the nanomaterials, MSE processing, engineering, and technical electives.
- Revision Reason:** Added a footnote for in order to include the list of technical elective options.
 - Format A:** Footnotes 4-8; Junior Year, Fall Semester; Senior Year, Fall and Spring Semesters
 - Format B:** n/a
- VIII. **Revision:** Add PY 206 (1 credit) and PY 209 (1 credit) as critical path courses in the Sciences under Major Field of Study Requirements on Format B.
- Revision Reason:** PY 206 and PY 209 are required labs that are corequisites for PY 205 and PY 209.
 - Format A:** correct on Format A
 - Format B:** Required Courses – Sciences
- IX. **Revision:** Add EC 201 and ARE 201 as equivalent course options for EC 205.
- Revision Reason:** EC 201 and ARE 201 are standard substitutions for EC 205
 - Format A:** Correct on Format A
 - Format B:** Required Courses – Sciences
- X. **Revision:** Add ENG 333 as substitution option for ENG 331 as technical writing course option
- Revision Reason:** ENG 333 is a standard substitution for ENG 331
 - Format A:** Correct on Format A
 - Format B:** College Requirements – Other
- XI. **Revision:** Change CH 460 to CHE 460 and update CHE 468 to be CHE (ECE) 468/568
- Revision Reason:** Correction of error for CH 460. Update CHE 468 to include all cross-listings of course.
 - Format A:** Footnote 3
 - Format B:** Concentration Courses - Nanomaterials Elective
- XII. **Revision:** Choose any course from the following list of engineering electives: CE 214, CE 225, CSC 110, ECE 331, ISE 311, MAE 206, MAE 208, MAE 214, MSE(NE) 409/509, MSE 485, NE 202, or TE 205. Only 1 advisor approved MSE 490 (special topics) course may be used to fulfill a Nanomaterials Concentration elective or technical elective. Departmental approval is required for MSE 495.
- Revision Reason:** The list of elective options was missing from the footnotes. All courses are approved engineering electives taken from MyPack Portal.
 - Format A:** Footnote 6
 - Format B:** Engineering Electives (GRP 061)
- XIII. **Revision:** Choose any course from the following list of technical electives: BCH 451, CH 223, CH 315, CH 401, MA 305, MA 351, MA 401, MA 402, MA 405, MEA 463, PY 328, PY 411 PY 412, PY 414, PY 415, PY 511, PY 512, PY 514, or PY 515.
- Revision Reason:** The list of elective options was missing from the footnotes. All courses are approved technical electives taken from MyPack Portal.
 - Format A:** Footnote 5
 - Format B:** Technical Electives (GRP 071)
- XIV. **Revision:** Update MSE Processing Electives: Add MSE 540, MSE 545, and MSE 556. Remove the sentence “This elective may be taken in the spring or fall semester by swapping it with a GEP requirement.”
- Revision Reason:** MSE 540, MSE 545, and MSE 556 are listed as MSE processing options in Degree Audit in MyPack Portal. Remove the sentence because it is confusing.
 - Format A:** Footnote 7
 - Format B:** MSE Processing Elective (GRP 080)
- XV. **Revision:** Ethics requirement to Format B under required courses: IDS 201, STS 302, STS 304, STS/PHI 325, PHI 214, PHI 221, or PHI 375. Satisfies 3 credits for either the Humanities or Interdisciplinary Perspective GEP Requirement. Update GEP Requirements to match. In Format A: Add “PHI 214, PHI 221, PHI/STS 325, or PHI 375 taken as part of the Major requirements satisfies 3 credit hours of the 6 credit hours needed to fulfill the GEP Humanities requirement.” under Humanities GEP requirements. Add “IDS 201, STS 302, STS 304 or STS/PHI 325 taken as part of the Major requirements satisfies 3 credit hours of the 5 credit hours needed to fulfill the GEP Interdisciplinary Perspectives requirement.” under Interdisciplinary Perspective.
- Revision Reason:** There was no corresponding requirement in the semester-by-semester plan to go with the footnote. The Ethics requirement was not listed on Format B at all.

- b. **Format A:** GEP Requirements
- c. **Format B:** Major Field of Study Requirements, Required Courses and General Education Program Requirements, Humanities and Interdisciplinary Perspectives

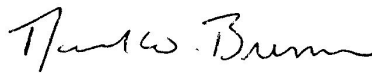
Impact on Other Departments: No impact as no additional courses are being added.

Impact on Current Students: No impact.

Proposed effective date: 8/2021



Director of Undergraduate Programs, Materials Science and Engineering
02/22/2021
Date



Head, Department of Materials Science and Engineering
2/22/2021
Date



Chair, COE Courses and Curriculum Committee
2/24/2021
Date



Dean, College of Engineering
02/26/2021
Date

Chair, University Courses and Curricula Committee
Date

Office of the Provost
Date

GEP FORMAT A - WITH MARK-UPS
(SEMESTER-BY-SEMESTER CURRICULUM DISPLAY)

Current:

Proposed: **X**

Proposed Effective Semester: **8/2021**

DEGREE TITLE: B.S. in Materials Science and Engineering

CONCENTRATION TITLE: n/a

CURRENT DEGREE KEY: 14MSEBS

FIRST YEAR

FALL	CR	SPRING	CR
CH 101 Chemistry, A Molecular Science ¹	3	CH 201 Chemistry, A Quant Science	3
CH 102 General Chemistry Lab ¹	1	CH 202 Quantitative Chemistry Lab	1
E 101 Intro. to Engr. & Problem Solving ^{1,2}	1	MA 241 Calculus II ¹	4
E 115 Intro to Computing Environ ^{1,2}	1	PY 205 Physics for Engineers & Scientists I ¹	3
ENG 101 Academic Writing and Research ^{1,2}	4	PY 206 Physics for Engineers & Scientists I Lab ¹	1
MA 141 Calculus I ¹	4	HES_***Health & Exercise Studies Course*	1
EC 205 Economics (or EC 201 or ARE 201)*	3	E 102 Engineering in the 21st Century (GEP-IP)	2
	17		15

SECOND YEAR

FALL	CR	SPRING	CR
MSE 201 Structure & Prop. of Engr. Materials ¹	3	MSE 255 Exp Meth Struct Analysis of Matls	2
ST 370 Prob. and Statistics for Engineers	3	MSE 260 Math Methods for Material Engrs.	3
MA 242 Calculus III	4	MSE 270 MSE Seminar	1
PY 208 Physics for Engineers & Scientists II	3	CH 220 Intro Organic Chemistry (or CH 221)	4 3
PY 209 Physics for Eng. & Scientists II Lab	1	CH 222 Organic Chemistry I Lab	1
HES_***Health & Exercise Studies Course*	1	MA 341 Applied Differential Equations I	3
		*** ** GEP Requirement*	3
	15		16

THIRD YEAR

FALL	CR	SPRING	CR
MSE 300 Structure of Materials at Nanoscale	3	MSE 355 Elect, Mag & Opt Prop of Materials	3
MSE 301 Intro to Thermodynamics of Matls	3	MSE 360 Kinetic Process in Materials	3
MSE 320 Intro to Defects in Solids	3	MSE 370 Microstructure of Inorganic Materials	3
MSE 335 Exp Meth Analysis of Matls Prop.	2	MSE 380 Microstructure of Organic Materials	3
*** *** Technical Elective ^{3,4,5}	3	*** *** Engineering Elective ^{3,4}	3
*** *** GEP Requirement*	3		
	17		15

FOURTH YEAR

FALL	CR	SPRING	CR
MSE 420 Mechanical Prop of Materials	3	MSE 470 Mat. Sci & Eng. Design Project	3
MSE 423 Intro. to Materials Eng. Design	1	MSE 480 Materials Forensics & Degradation	3
ENG 331 Technical Writing (or ENG 333)	3	*** *** Technical Elective ^{3,4,5}	3
MSE_*** MSE Processing Elective ³	3	*** *** GEP Requirement*	3
*** *** Technical Elective ^{3,4,5}	3	*** *** Ethics Elective (GEP Requirement*) ⁶	3
*** *** GEP Requirement*	3		
	16		15

Minimum Credit Hours Required for Graduation*: **126**

Major/Program requirements and footnotes

¹ Courses required for Change of Degree Audit (CODA). CH 101, 102; MA 141, 241; PY 205, 206 must be completed with a C or higher.

² Minimum grade of C-, E 115 requires satisfactory completion (S).

³ Choose any course from the following list of MSE processing electives: ~~CH-455~~, MSE 440, MSE 445, MSE 455, MSE 456, MSE 460, **MSE 540, MSE 545, or MSE 556**.

⁴ Choose any course from the following list of engineering electives: CE 214 ~~CE-215~~, ~~CE-313~~ **CE 225**, ~~CSC-200~~, CSC 110, ECE 331, ~~ISE/GC-210~~, ISE 311, MAE 206, MAE 208, MAE 214 ~~MSE-350~~, MSE(NE) 409/509, **MSE 465/565, MSE 485**, NE 202, or TE 205. Only 1 advisor approved MSE 490 (special topics) course may be used to fulfill an engineering or technical elective. **Department approval is required for MSE 495.**

⁵ Choose any course from the following list of technical electives: BCH 451, ~~CH 221~~, CH 223, CH 315, CH 401, CH 437, MA 305, MA 351, MA 401, MA 402, MA 405, MEA (~~PY~~) 463, PY 328, PY 407, PY 411/~~511~~, PY 412/~~512~~, PY 414/~~514~~, or PY 415/~~515~~. ~~ST 370, CHE 455, MSE 440, MSE 445, MSE 455, MSE 456, MSE 460~~

⁶ Ethics course must be chosen from the following list: IDS 201, STS 302, STS 304, STS/PHI 325, PHI 214, PHI 221, or PHI 375. Course will fulfill 3 credits for the Interdisciplinary Perspective and/or the Humanities GEP requirement depending on the course selected.

***General Education Program (GEP) requirements and GEP Footnotes**

To complete the requirements for graduation and the General Education Program, the following credit hours and co-requisites must be satisfied. University approved GEP course lists for each of the following categories can be found at: <https://oucc.dasa.ncsu.edu/general-education-program/>.

- A. **Mathematical Sciences** – (6 credit hours – one course with MA or ST prefix)
Fulfilled as part of the Major requirements.
- B. **Natural Sciences**– (7 credit hours – include one laboratory course or course with a lab)
Fulfilled as part of the Major requirements.
- C. **Humanities**– (6 credit hours selected from two different disciplines/course prefixes)
Choose from the University approved GEP Humanities course list. PHI 214, PHI 221, PHI/STS 325, or PHI 375 taken as part of the Major requirements satisfies 3 credit hours of the 6 credit hours needed to fulfill the GEP Humanities requirement.
- D. **Social Sciences**– (6 credit hours selected from two different disciplines/course prefixes)
Choose 3 credits from the University approved GEP Social Sciences course list in a discipline other than Economics. Economics 205 (or EC 201 or ARE 201), taken as part of the Major requirements, satisfies 3 credit hours needed to fulfill the GEP Social Sciences requirement.
- E. **Physical Education**– (2 credit hours at least one 100-level Fitness and Wellness Course.
Choose from the University approved GEP Physical Education/Healthy Living course list.
- F. **Additional Breadth**– (3 credits to be selected from the following checked University approved GEP course lists)
Choose one course from Humanities, Social Sciences, or Visual and Performing Arts
- G. **Interdisciplinary Perspectives** (5-6 credit hours)
Choose from the University approved GEP Interdisciplinary Perspectives course list. IDS 201, STS 302, STS 304 or STS/PHI 325 taken as part of the Major requirements satisfies 3 credit hours of the 5 credit hours needed to fulfill the GEP Interdisciplinary Perspectives requirement.
- H. **Introduction to Writing** (4 credit hours satisfied by completing ENG 101 with a C- or better)

The following **co-requisites** must be satisfied to complete the General Education Program requirements

- I. **U.S. Diversity (USD)**
Choose from the University approved GEP U.S. Diversity course list or choose a course identified on the approved GEP course lists as meeting the U.S. Diversity (USD) co-requisite.
- J. **Global Knowledge (GK)**
Choose from the University approved GEP Global Knowledge course list or choose a course identified on the approved GEP course lists as meeting the Global Knowledge (GK) co-requisite.

K. **Foreign Language proficiency** at the FL_102 level will be required for graduation

GEP FORMAT A - CLEAN
(SEMESTER-BY-SEMESTER CURRICULUM DISPLAY)

Current: Proposed: **X** Proposed Effective Semester: **8/2021**

DEGREE TITLE: B.S. in Materials Science and Engineering

CONCENTRATION TITLE: n/a

CURRENT DEGREE KEY: 14MSEBS

FIRST YEAR

FALL	CR	SPRING	CR
CH 101 Chemistry, A Molecular Science ¹	3	CH 201 Chemistry, A Quant Science	3
CH 102 General Chemistry Lab ¹	1	CH 202 Quantitative Chemistry Lab	1
E 101 Intro. to Engr. & Problem Solving ^{1,2}	1	MA 241 Calculus II ¹	4
E 115 Intro to Computing Environ ^{1,2}	1	PY 205 Physics for Engineers & Scientists I ¹	3
ENG 101 Academic Writing and Research ^{1,2}	4	PY 206 Physics for Engineers & Scientists I Lab ¹	1
MA 141 Calculus I ¹	4	HES_***Health & Exercise Studies Course*	1
EC 205 Economics (or EC 201 or ARE 201)*	3	E 102 Engineering in the 21st Century (GEP-IP)	2
	17		15

SECOND YEAR

FALL	CR	SPRING	CR
MSE 201 Structure & Prop. of Engr. Materials ¹	3	MSE 255 Exp Meth Struct Analysis of Matls	2
ST 370 Prob. and Statistics for Engineers	3	MSE 260 Math Methods for Material Engrs.	3
MA 242 Calculus III	4	MSE 270 MSE Seminar	1
PY 208 Physics for Engineers & Scientists II	3	CH 220 Intro Organic Chemistry (or CH 221)	3
PY 209 Physics for Eng. & Scientists II Lab	1	CH 222 Organic Chemistry I Lab	1
HES_***Health & Exercise Studies Course*	1	MA 341 Applied Differential Equations I	3
		*** ** GEP Requirement*	3
	15		16

THIRD YEAR

FALL	CR	SPRING	CR
MSE 300 Structure of Materials at Nanoscale	3	MSE 355 Elect, Mag & Opt Prop of Materials	3
MSE 301 Intro to Thermodynamics of Matls	3	MSE 360 Kinetic Process in Materials	3
MSE 320 Intro to Defects in Solids	3	MSE 370 Microstructure of Inorganic Materials	3
MSE 335 Exp Meth Analysis of Matls Prop.	2	MSE 380 Microstructure of Organic Materials	3
*** *** Technical Elective ^{3,4,5}	3	*** *** Engineering Elective ^{3,4}	3
*** *** GEP Requirement*	3		
	17		15

FOURTH YEAR

FALL	CR	SPRING	CR
MSE 420 Mechanical Prop of Materials	3	MSE 470 Mat. Sci & Eng. Design Project	3
MSE 423 Intro. to Materials Eng. Design	1	MSE 480 Materials Forensics & Degradation	3
ENG 331 Technical Writing (or ENG 333)	3	*** *** Technical Elective ^{3,4,5}	3
MSE_*** MSE Processing Elective ³	3	*** *** GEP Requirement*	3
*** *** Technical Elective ^{3,4,5}	3	*** *** Ethics Elective (GEP Requirement*) ⁶	3
*** *** GEP Requirement*	3		
	16		15

Minimum Credit Hours Required for Graduation*: **126**

Major/Program requirements and footnotes

¹ Courses required for Change of Degree Audit (CODA). CH 101, 102; MA 141, 241; PY 205, 206 must be completed with a C or higher.

² Minimum grade of C-, E 115 requires satisfactory completion (S).

³ Choose any course from the following list of MSE processing electives: MSE 440, MSE 445, MSE 455, MSE 456, MSE 460, MSE 540, MSE 545, or MSE 556.

⁴ Choose any course from the following list of engineering electives: CE 214, CE 225, CSC 110, ECE 331, ISE 311, MAE 206, MAE 208, MAE 214, MSE(NE) 409/509, MSE 465/565, MSE 485, NE 202, or TE 205. Only 1 advisor approved MSE 490 (special topics) course may be used to fulfill an engineering or technical elective. Department approval is required for MSE 495.

⁵ Choose any course from the following list of technical electives: BCH 451, CH 223, CH 315, CH 401, CH 437, MA 305, MA 351, MA 401, MA 402, MA 405, MEA 463, PY 328, PY 407, PY 411/511, PY 412/512, PY 414/514, or PY 415/515.

⁶ Ethics course must be chosen from the following list: IDS 201, STS 302, STS 304, STS/PHI 325, PHI 214, PHI 221, or PHI 375. Course will fulfill 3 credits for the Interdisciplinary Perspective and/or the Humanities GEP requirement depending on the course selected.

***General Education Program (GEP) requirements and GEP Footnotes**

To complete the requirements for graduation and the General Education Program, the following credit hours and co-requisites must be satisfied. University approved GEP course lists for each of the following categories can be found at: <https://oucc.dasa.ncsu.edu/general-education-program/>.

- L. **Mathematical Sciences** – (6 credit hours – one course with MA or ST prefix)
Fulfilled as part of the Major requirements.
- M. **Natural Sciences**– (7 credit hours – include one laboratory course or course with a lab)
Fulfilled as part of the Major requirements.
- N. **Humanities**– (6 credit hours selected from two different disciplines/course prefixes)
Choose from the University approved GEP Humanities course list. PHI 214, PHI 221, PHI/STS 325, or PHI 375 taken as part of the Major requirements satisfies 3 credit hours of the 6 credit hours needed to fulfill the GEP Humanities requirement.
- O. **Social Sciences**– (6 credit hours selected from two different disciplines/course prefixes)
Choose 3 credits from the University approved GEP Social Sciences course list in a discipline other than Economics. Economics 205 (or EC 201 or ARE 201), taken as part of the Major requirements, satisfies 3 credit hours needed to fulfill the GEP Social Sciences requirement.
- P. **Physical Education**– (2 credit hours at least one 100-level Fitness and Wellness Course.
Choose from the University approved GEP Physical Education/Healthy Living course list.
- Q. **Additional Breadth**– (3 credits to be selected from the following checked University approved GEP course lists)
Choose one course from Humanities, Social Sciences, or Visual and Performing Arts
- R. **Interdisciplinary Perspectives** (5-6 credit hours)
Choose from the University approved GEP Interdisciplinary Perspectives course list. IDS 201, STS 302, STS 304 or STS/PHI 325 taken as part of the Major requirements satisfies 3 credit hours of the 5 credit hours needed to fulfill the GEP Interdisciplinary Perspectives requirement.
- S. **Introduction to Writing** (4 credit hours satisfied by completing ENG 101 with a C- or better)

The following **co-requisites** must be satisfied to complete the General Education Program requirements

- T. **U.S. Diversity (USD)**
Choose from the University approved GEP U.S. Diversity course list or choose a course identified on the approved GEP course lists as meeting the U.S. Diversity (USD) co-requisite.
- U. **Global Knowledge (GK)**
Choose from the University approved GEP Global Knowledge course list or choose a course identified on the approved GEP course lists as meeting the Global Knowledge (GK) co-requisite.

V. **Foreign Language proficiency** at the FL_102 level will be required for graduation

CURRICULUM REQUIREMENTS

Format B - WITH MARK-UPS

<u>Degree/Plan Title:</u> Bachelor of Science in Materials Science and Engineering	<u>Plan SIS Code:</u> 14MSEBS
<u>Concentration/Subplan Title:</u>	<u>Subplan SIS Code:</u>
<u>Indicate requirements status:</u> Current: Proposed: X	<u>Proposed Effective Semester:</u> Fall 2021
<u>New Degree Audit required?</u> (Y or N) Yes	
<p><u>Critical Path Courses</u> - Identify using the code (CP) which courses are considered critical path courses which represent specific major requirements that are predictive of student success in a given program/plan. Place the (CP) next to the credit hours for the course.</p>	

MAJOR FIELD OF STUDY REQUIREMENTS:		
Required Courses/Groups/ Electives:	Credit Hours	GEP category, if applicable
Indicate if course or course groupings have a C-wall or MGPA requirement and which are considered Critical Path courses – indicate with (CP) next to applic. course.		List GEP category and hours satisfied by a Major requirement
MATH		
MA 141 (CP)	4	Mathematics (6 hours)
MA 241 (CP)	4	
MA 242 (CP)	4	
MA 341	3	
ST 370	3	
SCIENCES		
CH 101 (CP)	3	Natural Sciences (8 hours)
CH 102 (CP)	1	
CH 201	3	
CH 202	1	
CH 220 OR CH 221	4 3	
CH 222	1	
PY 205 (CP)	3	
PY 206 (CP)	1	
PY 208 (CP)	3	
PY 209 (CP)	1	
ECONOMICS		
EC 205 OR EC 201 OR ARE 201	3	Social Sciences (3 hours)
ETHICS		
IDS 201, STS 302, STS 304, STS/PHI 325, PHI 214, PHI 221, or PHI 375	3	Humanities and/or Interdisciplinary Perspective (3)
REQUIRED COURSES		
MSE 201 (CP)	3	

MSE 255	2	
MSE 260	3	
MSE 270	1	
MSE 300	3	
MSE 301	3	
MSE 320	3	
MSE 335	2	
MSE 355	3	
MSE 360	3	
MSE 370	3	
MSE 380	3	
MSE 420	3	
MSE 423	1	
MSE 470	3	
MSE 480	3	
Concentration Courses/Groups/Electives:	15	
<u>GRP 080 - MSE Processing Elective (choose 1 course)</u>		
MSE 440	3	
MSE 445	3	
MSE 455	3	
MSE 456	3	
MSE 460	3	
MSE 540	3	
MSE 545	3	
MSE 556	3	
<u>GRP 061 - Engineering Elective (choose 1 course)</u>		
Any MSE processing elective	3	
CE 214	3	
GE 245		
GE 343 CE 225	3	
GHE 455		
CSC 110	3	
GSC 200	3	
E 304	3	
ECE 331	3	
ISE/CE 240		

ISE 311	3	
MAE 206	3	
MAE 208	3	
MAE 314 MAE 214		
MSE (NE) 409/509	3	
MSE 360		
MSE 465/565	3	
MSE 485	3	
MSE 490B	1-4	
MSE 495	1-6	
NE 202	4	
TE 205	4	
GRP 071 - Technical Electives (choose 3 courses)		
Any MSE processing elective		
Any engineering elective		
BCH 451	4	
CH 221		
CH 223	3	
CH 315	3	
CH 401	3	
CH 437	4	
MA 305	3	
MA 351	3	
MA 401	3	
MA 402	3	
MA 405	3	
MEA/PY 463	3	
PY 328	3	
PY 407	3	
PY 411/511	3	
PY 412/512	3	
PY 414/514	3	
PY 415/515	3	
Free Electives:		
Total credit hours under Major Field of Study: Minimum 27 hours required in program area.	98	

COLLEGE REQUIREMENTS:		
Orientation Course(s): E 101 and E 115	2	
Other: ENG 331 or ENG 333	3	Satisfies Communication in the Major GEP co-requisite
Total credit hours under College Requirements:	5	

NCSU GENERAL EDUCATION PROGRAM REQUIREMENTS <i>Courses in the Major and/or Minor may also fulfill a General Education requirement; however, a GEP category <u>may not be subset</u> to require a specific course from the category list. Required courses must be listed in the Major/College requirements.</i> Specific courses should not be listed in any of the fields below other than ENG 101.		At least one of the following must be listed: <ol style="list-style-type: none"> Choose course(s) from the University Approved GEP course list for this category. Minimum requirements are satisfied by Major/College course requirements. Major/College course requirement satisfies X credit hrs of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category. Co-requisite is satisfied by a Major/College course requirement. Choose course(s) from the University Approved GEP course lists for the Humanities/ Social Sciences/ Visual & Performing Arts. Choose course(s) from the University Approved GEP course lists for Natural Sciences/Mathematical Sciences.
General Education Program Requirements: <i>Minimum 39-40 hrs</i>	Credit hours	How will the GEP requirement be met? <i>(Choose applicable statement from 1-6 listed above)</i>
Mathematical Sciences (6 credits) <i>(At least 1 course with MA or ST prefix)</i> <i>Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.</i>	X	2. Minimum requirements are satisfied by Major/College course requirements.
Natural Sciences (7 credits) <i>(At least 1 lab course or course with a lab)</i> <i>Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.</i>	X	2. Minimum requirements are satisfied by Major/College course requirements.
English 101 (C- or better required) (4 credits)	4	ENG 101
Humanities (6 credits) <i>(Courses from two different disciplines)</i> <i>Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.</i>	3-6	3. Course in the Major (PHI 214, PHI 221, STS/PHI 325, or PHI 375) satisfies 3 credit hrs. of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category
Social Sciences (6 credits) <i>(Courses from two different disciplines)</i> <i>Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.</i>	3	3. Course in the Major (EC 205) satisfies 3 credit hrs. of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category
Additional Breadth (3 credits) <i>(Choose approach that is different from the approach of the Major)</i> Major/College requirements cannot satisfy this requirement and an AB course cannot be double-counted except in satisfying the Global Knowledge or U.S. Diversity co-requisites.	3	5. Choose course(s) from the University Approved GEP course lists for the Humanities/Social Sciences/Visual and Performing Arts
Interdisciplinary Perspectives (5 credits) <i>Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.</i>	3-6	3. Course in the Major (IDS 201, STS 302, STS 304, or STS/PHI 325) satisfies 3 credit hrs. of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category
Health and Exercise Studies (2 credits) <i>(Including one Fitness and Wellness course)</i>	2	1. Choose course(s) from the University Approved GEP course list for this category.
Total credit hours needed to complete GEP that are <u>not</u> satisfied as part of the Major/College requirements.	23-24	
GEP Co-Requisites:		<i>Courses taken in the Major, GEP, or Minor may double-count to fulfill the co-requisites. Courses that satisfy the U.S. Diversity or Global Knowledge co-requisite are marked on course lists with a "USD" or "GK" indicator.</i>
U.S. Diversity co-requisite (USD)	n/a	1. Choose course(s) from the University Approved GEP course list for this category.
Global Knowledge co-requisite (GK)	n/a	1. Choose course(s) from the University Approved GEP course list for this category.
Foreign Language Proficiency	n/a	Proficiency at the FL_102 level required.

The following requirements must be satisfied within the College/Program:		Place an X in the credit hour box to indicate below that the requirement is "Satisfied by College/Program Requirements"
Communication in the Major (Advanced Communication)	X	Satisfied by College/Program Requirements
Technology Fluency	X	Satisfied by College/Program Requirements
Total credit hours required to complete Degree: Total must be within 120-128 credit hours.	126	As applicable, indicate here the overall GPA requirement for degree completion including course completion.

CURRICULUM REQUIREMENTS

Format B - **CLEAN**

<u>Degree/Plan Title</u> : Bachelor of Science in Materials Science and Engineering	<u>Plan SIS Code</u> : 14MSEBS
Concentration/Subplan Title:	Subplan SIS Code:
<u>Indicate requirements status</u> : Current: Proposed: X <u>Proposed</u> Effective Semester: Fall 2021	
<u>New Degree Audit required?</u> (Y or N) Yes	
<u>Critical Path Courses</u> - Identify using the code (CP) which courses are considered critical path courses which represent specific major requirements that are predictive of student success in a given program/plan. Place the (CP) next to the credit hours for the course.	

MAJOR FIELD OF STUDY REQUIREMENTS:		
<i>Required Courses/Groups/ Electives:</i>	<i>Credit Hours</i>	<i>GEP category, if applicable</i>
Indicate if course or course groupings have a C-wall or MGPA requirement and which are considered Critical Path courses – indicate with (CP) next to applic. course.		List GEP category and hours satisfied by a Major requirement
MATH		
MA 141 (CP)	4	Mathematics (6 hours)
MA 241 (CP)	4	
MA 242 (CP)	4	
MA 341	3	
ST 370	3	
SCIENCES		
CH 101 (CP)	3	Natural Sciences (8 hours)
CH 102 (CP)	1	
CH 201	3	
CH 202	1	
CH 220 OR CH 221	3	
CH 222	1	
PY 205 (CP)	3	
PY 206 (CP)	1	
PY 208 (CP)	3	
PY 209 (CP)	1	
ECONOMICS		
EC 205 OR EC 201 OR ARE 201	3	Social Sciences (3 hours)
ETHICS		
IDS 201, STS 302, STS 304, STS/PHI 325, PHI 214, PHI 221, or PHI 375	3	Humanities and/or Interdisciplinary Perspective (3)
REQUIRED COURSES		
MSE 201 (CP)	3	

MSE 255	2	
MSE 260	3	
MSE 270	1	
MSE 300	3	
MSE 301	3	
MSE 320	3	
MSE 335	2	
MSE 355	3	
MSE 360	3	
MSE 370	3	
MSE 380	3	
MSE 420	3	
MSE 423	1	
MSE 470	3	
MSE 480	3	
Concentration Courses/Groups/Electives:	15	
<u>GRP 080 - MSE Processing Elective (choose 1 course)</u>		
MSE 440	3	
MSE 445	3	
MSE 455	3	
MSE 456	3	
MSE 460	3	
MSE 540	3	
MSE 545	3	
MSE 556	3	
<u>GRP 061 - Engineering Elective (choose 1 course)</u>		
Any MSE processing elective	3	
CE 214	3	
CE 225	3	
CSC 110	3	
ECE 331	3	
ISE 311	3	
MAE 206	3	
MAE 208	3	
MAE 214		
MSE (NE) 409/509	3	

MSE 465/565	3	
MSE 485	3	
MSE 490	1-4	
MSE 495	1-6	
NE 202	4	
TE 205	4	
GRP 071 - Technical Electives (choose 3 courses)		
Any MSE processing elective		
Any engineering elective		
BCH 451	4	
CH 223	3	
CH 315	3	
CH 401	3	
CH 437	4	
MA 305	3	
MA 351	3	
MA 401	3	
MA 402	3	
MA 405	3	
MEA 463	3	
PY 328	3	
PY 407	3	
PY 411/511	3	
PY 412/512	3	
PY 414/514	3	
PY 415/515	3	
Free Electives:		
Total credit hours under Major Field of Study: <i>Minimum 27 hours required in program area.</i>	98	
COLLEGE REQUIREMENTS:		
Orientation Course(s): E 101 and E 115	2	
Other: ENG 331 or ENG 333	3	Satisfies Communication in the Major GEP co-requisite
Total credit hours under College Requirements:	5	

NCSU GENERAL EDUCATION PROGRAM REQUIREMENTS <i>Courses in the Major and/or Minor may also fulfill a General Education requirement; however, a GEP category <u>may not be subset</u> to require a specific course from the category list. Required courses must be listed in the Major/College requirements.</i> Specific courses should not be listed in any of the fields below other than ENG 101.		At least one of the following must be listed: 7. Choose course(s) from the University Approved GEP course list for this category. 8. Minimum requirements are satisfied by Major/College course requirements. 9. Major/College course requirement satisfies X credit hrs of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category. 10. Co-requisite is satisfied by a Major/College course requirement. 11. Choose course(s) from the University Approved GEP course lists for the Humanities/ Social Sciences/ Visual & Performing Arts. 12. Choose course(s) from the University Approved GEP course lists for Natural Sciences/Mathematical Sciences.
General Education Program Requirements: <i>Minimum 39-40 hrs</i>	Credit hours	How will the GEP requirement be met? (Choose applicable statement from 1-6 listed above)
Mathematical Sciences (6 credits) (At least 1 course with MA or ST prefix) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	X	2. Minimum requirements are satisfied by Major/College course requirements.
Natural Sciences (7 credits) (At least 1 lab course or course with a lab) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	X	2. Minimum requirements are satisfied by Major/College course requirements.
English 101 (C- or better required) (4 credits)	4	ENG 101
Humanities (6 credits) (Courses from two different disciplines) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	3-6	3. Course in the Major (PHI 214, PHI 221, STS/PHI 325, or PHI 375) satisfies 3 credit hrs. of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category
Social Sciences (6 credits) (Courses from two different disciplines) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	3	3. Course in the Major (EC 205) satisfies 3 credit hrs. of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category
Additional Breadth (3 credits) (Choose approach that is different from the approach of the Major) Major/College requirements cannot satisfy this requirement and an AB course cannot be double-counted except in satisfying the Global Knowledge or U.S. Diversity co-requisites.	3	5. Choose course(s) from the University Approved GEP course lists for the Humanities/Social Sciences/Visual and Performing Arts
Interdisciplinary Perspectives (5 credits) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	3-6	3. Course in the Major (IDS 201, STS 302, STS 304, or STS/PHI 325) satisfies 3 credit hrs. of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category
Health and Exercise Studies (2 credits) (Including one Fitness and Wellness course)	2	1. Choose course(s) from the University Approved GEP course list for this category.
Total credit hours needed to complete GEP that are <u>not</u> satisfied as part of the Major/College requirements.	23-24	
GEP Co-Requisites:		Courses taken in the Major, GEP, or Minor may double-count to fulfill the co-requisites. Courses that satisfy the U.S. Diversity or Global Knowledge co-requisite are marked on course lists with a "USD" or "GK" indicator.
U.S. Diversity co-requisite (USD)	n/a	1. Choose course(s) from the University Approved GEP course list for this category.
Global Knowledge co-requisite (GK)	n/a	1. Choose course(s) from the University Approved GEP course list for this category.
Foreign Language Proficiency	n/a	Proficiency at the FL_102 level required.
The following requirements must be satisfied within the College/Program:		Place an X in the credit hour box to indicate below that the requirement is " Satisfied by College/Program Requirements "
Communication in the Major (Advanced Communication)	X	Satisfied by College/Program Requirements
Technology Fluency	X	Satisfied by College/Program Requirements
Total credit hours required to complete Degree: Total must be within 120-128 credit hours.	126	As applicable, indicate here the overall GPA requirement for degree completion including course completion.

GEP FORMAT A - WITH MARK-UPS
(SEMESTER-BY-SEMESTER CURRICULUM DISPLAY)

Current:

Proposed: **X**

Proposed Effective Semester: **8/2021**

DEGREE TITLE: B.S. in Materials Science and Engineering: Biomaterials

CONCENTRATION TITLE: n/a

CURRENT DEGREE KEY: 14MSEBS - 14MSEBIO

FIRST YEAR

FALL	CR	SPRING	CR
CH 101 Chemistry, A Molecular Science ¹	3	CH 201 Chemistry, A Quant Science	3
CH 102 General Chemistry Lab ¹	1	CH 202 Quantitative Chemistry Lab	1
E 101 Intro. to Engr. & Problem Solving ^{1,2}	1	MA 241 Calculus II ¹	4
E 115 Intro to Computing Environ ^{1,2}	1	PY 205 Physics for Engineers & Scientists I ¹	3
ENG 101 Academic Writing and Research ^{1,2}	4	PY 206 Physics for Engineers & Scientists I Lab ¹	1
MA 141 Calculus I ¹	4	HES_***Health & Exercise Studies Course*	1
EC 205 Economics (or EC 201 or ARE 201)*	3	*** ** GEP Requirement*	3
	17		16

SECOND YEAR

FALL	CR	SPRING	CR
MSE 203 Intro. to the Materials Science of Biomaterials MSE 201 Structure & Prop. of Engr. Materials ¹	3	MSE 255 Exp Meth Struct Analysis of Matls	2
BIO 183 Intro. Biology: Cellular & Molecular Bio.	3	MSE 260 Math Methods for Material Engrs.	3
MA 242 Calculus III	4	MSE 270 MSE Seminar	1
PY 208 Physics for Engineers & Scientists II	3	CH 220 Intro Organic Chemistry (or CH 221)	4 3
PY 209 Physics for Eng. & Scientists II Lab	1	CH 222 Organic Chemistry I Lab	1
HES_***Health & Exercise Studies Course*	1	MA 341 Applied Differential Equations I	3
		*** ** GEP Requirement*	3
	15		16

THIRD YEAR

FALL	CR	SPRING	CR
MSE 300 Structure of Materials at Nanoscale	3	MSE 355 Elect, Mag & Opt Prop of Materials	3
MSE 301 Intro to Thermodynamics of Matls	3	MSE 360 Kinetic Process in Materials	3
MSE 320 Intro to Defects in Solids	3	MSE 370 Microstructure of Inorganic Materials	3
MSE 335 Exp Meth Analysis of Matls Prop.	2	MSE 380 Microstructure of Organic Materials	3
*** ** GEP Requirement*	3	MSE 485 Biomaterials	3
*** ** GEP Requirement*	3		
	17		15

FOURTH YEAR

FALL	CR	SPRING	CR
MSE 420 Mechanical Prop of Materials	3	MSE 470 Mat. Sci & Eng. Design Project	3
MSE 423 Intro. to Materials Eng. Design	1	MSE 480 Materials Forensics & Degradation	3
ENG 331 Technical Writing (or ENG 333)	3	ST 370 Prob. and Statistics for Engineers	3
MSE_*** MSE Processing Elective ⁵	3	*** ** Biomaterials Concentration Elective ^{3,4}	2-4
*** ** Biomaterials Concentration Elective ^{3,4}	2-4	*** ** Ethics Elective (GEP Requirement*) ⁶	3
*** ** GEP Requirement*	3		
	15-17		14-16

Minimum Credit Hours Required for Graduation*: **126**

Major/Program requirements and footnotes

¹ Courses required for Change of Degree Audit (CODA). CH 101, 102; MA 141, 241; PY 205, 206 must be completed with a C or higher.

² Minimum grade of C-, E 115 requires satisfactory completion (S).

³ Choose **any course from the following list of biomaterials concentration electives**: BCH 351, BCH 451, BEC (CHE) 462/562, BEC (CHE) 488/588, BIO 414, BIT 410, BIT (PO) 466/566, ~~BME 301~~, ~~BME 462~~, BME (TE) 466/566, BME (TE) 467, BME (BEC) 483/583, ~~BME 484~~, MT 323, MT 366, MT 432, MT (PCC) 471, PSE 332, PSE (CH) 335, PSE 425. Additional biomaterials concentration electives may be approved by the MSE Director of Undergraduate Programs. Only 1 advisor approved MSE 490 (special topics) course may be used to fulfill a biomaterials concentration elective. **Departmental approval is required for MSE 495.**

⁴ Biomaterials concentration must total at least 5 credit hours.

- ⁵ Choose a course from the following list of MSE processing electives: MSE 440, MSE 445, MSE 455, MSE 456, MSE 460 MSE 540, MSE 545, or MSE 556. ~~This elective may be taken in the spring or fall semester by swapping it with a Technical Elective.~~
- ⁶ Ethics course must be chosen from the following list: IDS 201, STS 302, STS 304, STS/PHI 325, PHI 214, PHI 221, or PHI 375. Course will fulfill 3 credits for the Interdisciplinary Perspective and/or the Humanities GEP requirement depending on the course selected.

***General Education Program (GEP) requirements and GEP Footnotes**

To complete the requirements for graduation and the General Education Program, the following credit hours and co-requisites must be satisfied. University approved GEP course lists for each of the following categories can be found at: <https://oucc.dasa.ncsu.edu/general-education-program/>.

- A. **Mathematical Sciences** – (6 credit hours – one course with MA or ST prefix)
Fulfilled as part of the Major requirements.
- B. **Natural Sciences**– (7 credit hours – include one laboratory course or course with a lab)
Fulfilled as part of the Major requirements.
- C. **Humanities**– (6 credit hours selected from two different disciplines/course prefixes)
Choose from the University approved GEP Humanities course list. PHI 214, PHI 221, PHI/STS 325, or PHI 375 taken as part of the Major requirements satisfies 3 credit hours of the 6 credit hours needed to fulfill the GEP Humanities requirement.
- D. **Social Sciences**– (6 credit hours selected from two different disciplines/course prefixes)
Choose 3 credits from the University approved GEP Social Sciences course list in a discipline other than Economics. Economics 205 (or EC 201 or ARE 201), taken as part of the Major requirements, satisfies 3 credit hours needed to fulfill the GEP Social Sciences requirement.
- E. **Physical Education**– (2 credit hours at least one 100-level Fitness and Wellness Course.
Choose from the University approved GEP Physical Education/Healthy Living course list.
- F. **Additional Breadth**– (3 credits to be selected from the following checked University approved GEP course lists)
Choose one course from Humanities, Social Sciences, or Visual and Performing Arts
- G. **Interdisciplinary Perspectives** (5-6 credit hours)
Choose from the University approved GEP Interdisciplinary Perspectives course list. IDS 201, STS 302, STS 304 or STS/PHI 325 taken as part of the Major requirements satisfies 3 credit hours of the 5 credit hours needed to fulfill the GEP Interdisciplinary Perspectives requirement.
- H. **Introduction to Writing** (4 credit hours satisfied by completing ENG 101 with a C- or better)

The following **co-requisites** must be satisfied to complete the General Education Program requirements

- I. **U.S. Diversity (USD)**
Choose from the University approved GEP U.S. Diversity course list or choose a course identified on the approved GEP course lists as meeting the U.S. Diversity (USD) co-requisite.
- J. **Global Knowledge (GK)**
Choose from the University approved GEP Global Knowledge course list or choose a course identified on the approved GEP course lists as meeting the Global Knowledge (GK) co-requisite.
- K. **Foreign Language proficiency** at the FL_102 level will be required for graduation

GEP FORMAT A - CLEAN VERSION
(SEMESTER-BY-SEMESTER CURRICULUM DISPLAY)

Current: Proposed: **X** Proposed Effective Semester: **8/2021**

DEGREE TITLE: B.S. in Materials Science and Engineering: Biomaterials

CONCENTRATION TITLE: n/a

CURRENT DEGREE KEY: 14MSEBS - 14MSEBIO

FIRST YEAR

FALL	CR	SPRING	CR
CH 101 Chemistry, A Molecular Science ¹	3	CH 201 Chemistry, A Quant Science	3
CH 102 General Chemistry Lab ¹	1	CH 202 Quantitative Chemistry Lab	1
E 101 Intro. to Engr. & Problem Solving ^{1,2}	1	MA 241 Calculus II ¹	4
E 115 Intro to Computing Environ ^{1,2}	1	PY 205 Physics for Engineers & Scientists I ¹	3
ENG 101 Academic Writing and Research ^{1,2}	4	PY 206 Physics for Engineers & Scientists I Lab ¹	1
MA 141 Calculus I ¹	4	HES_***Health & Exercise Studies Course*	1
EC 205 Economics (or EC 201 or ARE 201)*	3	*** ** GEP Requirement*	3
	17		16

SECOND YEAR

FALL	CR	SPRING	CR
MSE 201 Structure & Prop. of Engr. Materials ¹	3	MSE 255 Exp Meth Struct Analysis of Matls	2
BIO 183 Introductory Biology: Cellular & Molecular Bio.	3	MSE 260 Math Methods for Material Engrs.	3
MA 242 Calculus III	4	MSE 270 MSE Seminar	1
PY 208 Physics for Engineers & Scientists II	3	CH 220 Intro Organic Chemistry (or CH 221)	3
PY 209 Physics for Eng. & Scientists II Lab	1	CH 222 Organic Chemistry I Lab	1
HES_***Health & Exercise Studies Course*	1	MA 341 Applied Differential Equations I	3
		*** ** GEP Requirement*	3
	15		16

THIRD YEAR

FALL	CR	SPRING	CR
MSE 300 Structure of Materials at Nanoscale	3	MSE 355 Elect, Mag & Opt Prop of Materials	3
MSE 301 Intro to Thermodynamics of Matls	3	MSE 360 Kinetic Process in Materials	3
MSE 320 Intro to Defects in Solids	3	MSE 370 Microstructure of Inorganic Materials	3
MSE 335 Exp Meth Analysis of Matls Prop.	2	MSE 380 Microstructure of Organic Materials	3
*** ** GEP Requirement*	3	MSE 485 Biomaterials	3
*** ** GEP Requirement*	3		
	17		15

FOURTH YEAR

FALL	CR	SPRING	CR
MSE 420 Mechanical Prop of Materials	3	MSE 470 Mat. Sci & Eng. Design Project	3
MSE 423 Intro. to Materials Eng. Design	1	MSE 480 Materials Forensics & Degradation	3
ENG 331 Technical Writing (or ENG 333)	3	ST 370 Prob. and Statistics for Engineers	3
MSE_*** MSE Processing Elective ⁵	3	*** ** Biomaterials Concentration Elective	2-4
*** ** Biomaterials Concentration Elective ^{3,4}	2-4	*** ** Ethics Elective (GEP Requirement*) ⁶	3
*** ** GEP Requirement*	3		
	15-17		14-16

Minimum Credit Hours Required for Graduation*: **126**

Major/Program requirements and footnotes

¹ Courses required for Change of Degree Audit (CODA). CH 101, 102; MA 141, 241; PY 205, 206 must be completed with a C or higher.

² Minimum grade of C-, E 115 requires satisfactory completion (S).

³ Choose any course from the following list of biomaterials concentration electives: BCH 351, BCH 451, BEC (CHE) 462/562, BEC (CHE) 488/588, BIO 414, BIT 410, BIT (PO) 466/566, BME (TE) 466/566, BME (TE) 467, BME (BEC) 483/583, MT 323, MT 366, MT 432, MT (PCC) 471, PSE 332, PSE (CH) 335, PSE 425. Additional biomaterials concentration electives may be approved by the MSE Director of Undergraduate Programs. Only 1 advisor approved MSE 490 (special topics) course may be used to fulfill a biomaterials concentration elective. Departmental approval is required for MSE 495.

⁴ Biomaterials concentration must total at least 5 credit hours.

⁵ Choose a course from the following list of MSE processing electives: MSE 440, MSE 445, MSE 455, MSE 456, MSE 460 MSE 540, MSE 545, or MSE 556.

⁶ Ethics course must be chosen from the following list: IDS 201, STS 302, STS 304, STS/PHI 325, PHI 214, PHI 221, or PHI 375. Course will fulfill 3 credits for the Interdisciplinary Perspective and/or the Humanities GEP requirement depending on the course selected.

***General Education Program (GEP) requirements and GEP Footnotes**

To complete the requirements for graduation and the General Education Program, the following credit hours and co-requisites must be satisfied. University approved GEP course lists for each of the following categories can be found at: <https://oucc.dasa.ncsu.edu/general-education-program/>.

- L. **Mathematical Sciences** – (6 credit hours – one course with MA or ST prefix)
Fulfilled as part of the Major requirements.
- M. **Natural Sciences**– (7 credit hours – include one laboratory course or course with a lab)
Fulfilled as part of the Major requirements.
- N. **Humanities**– (6 credit hours selected from two different disciplines/course prefixes)
Choose from the University approved GEP Humanities course list. PHI 214, PHI 221, PHI/STS 325, or PHI 375 taken as part of the Major requirements satisfies 3 credit hours of the 6 credit hours needed to fulfill the GEP Humanities requirement.
- O. **Social Sciences**– (6 credit hours selected from two different disciplines/course prefixes)
Choose 3 credits from the University approved GEP Social Sciences course list in a discipline other than Economics. Economics 205 (or EC 201 or ARE 201), taken as part of the Major requirements, satisfies 3 credit hours needed to fulfill the GEP Social Sciences requirement.
- P. **Physical Education**– (2 credit hours at least one 100-level Fitness and Wellness Course.
Choose from the University approved GEP Physical Education/Healthy Living course list.
- Q. **Additional Breadth**– (3 credits to be selected from the following checked University approved GEP course lists)
Choose one course from Humanities, Social Sciences, or Visual and Performing Arts
- R. **Interdisciplinary Perspectives** (5-6 credit hours)
Choose from the University approved GEP Interdisciplinary Perspectives course list. IDS 201, STS 302, STS 304 or STS/PHI 325 taken as part of the Major requirements satisfies 3 credit hours of the 5 credit hours needed to fulfill the GEP Interdisciplinary Perspectives requirement.
- S. **Introduction to Writing** (4 credit hours satisfied by completing ENG 101 with a C- or better)

The following **co-requisites** must be satisfied to complete the General Education Program requirements

- T. **U.S. Diversity (USD)**
Choose from the University approved GEP U.S. Diversity course list or choose a course identified on the approved GEP course lists as meeting the U.S. Diversity (USD) co-requisite.
- U. **Global Knowledge (GK)**
Choose from the University approved GEP Global Knowledge course list or choose a course identified on the approved GEP course lists as meeting the Global Knowledge (GK) co-requisite.
- V. **Foreign Language proficiency** at the FL_102 level will be required for graduation

CURRICULUM REQUIREMENTS

Format B - WITH MARK-UPS

<u>Degree/Plan Title</u> : Bachelor of Science in Materials Science and Engineering	<u>Plan SIS Code</u> : 14MSEBS
Concentration/Subplan Title: Biomaterials	Subplan SIS Code: 14MSEBIO
<u>Indicate requirements status</u> : Current: Proposed: X <u>Proposed</u> Effective Semester: Fall 2021	
<u>New Degree Audit required?</u> (Y or N) Yes	
<u>Critical Path Courses</u> - Identify using the code (CP) which courses are considered critical path courses which represent specific major requirements that are predictive of student success in a given program/plan. Place the (CP) next to the credit hours for the course.	

MAJOR FIELD OF STUDY REQUIREMENTS:		
<i>Required Courses/Groups/ Electives:</i>	<i>Credit Hours</i>	<i>GEP category, if applicable</i>
Indicate if course or course groupings have a C-wall or MGPA requirement and which are considered Critical Path courses – indicate with (CP) next to applic. course.		List GEP category and hours satisfied by a Major requirement
MATH		
MA 141 (CP)	4	Mathematics (6 hours)
MA 241 (CP)	4	
MA 242 (CP)	4	
MA 341	3	
ST 370	3	
SCIENCES		
CH 101 (CP)	3	Natural Sciences (8 hours)
CH 102 (CP)	1	
CH 201	3	
CH 202	1	
CH 220 OR CH 221	4 3	
CH 222	1	
PY 205 (CP)	3	
PY 206 (CP)	1	
PY 208 (CP)	3	
PY 209 (CP)	1	
ECONOMICS		
EC 205 OR EC 201 OR ARE 201	3	Social Sciences (3 hours)
ETHICS		
IDS 201, STS 302, STS 304, STS/PHI 325, PHI 214, PHI 221, or PHI 375	3	Humanities and/or Interdisciplinary Perspective (3)
REQUIRED COURSES		
MSE 201 (CP)	3	

MSE/BME 203	3	
MSE 255	2	
MSE 260	3	
MSE 270	1	
MSE 300	3	
MSE 301	3	
MSE 320	3	
MSE 335	2	
MSE 355	3	
MSE 360	3	
MSE 370	3	
MSE 380	3	
MSE 420	3	
MSE 423	1	
MSE 470	3	
MSE 480	3	
Concentration Courses/Groups/Electives:	15	
<u>Biomaterials Concentration Courses</u>		
BIO 183	3	
MSE 485	3	
<u>Biomaterials Elective (5 credit hour minimum)</u>		
BCH 351	3	
BCH 451	3	
BEC (CHE) 462/ 562	3	
BEC (CHE) 488/ 588	2	
BIO 414	3	
BIT 410	4	
BIT (PO) 466/ 566	2	
BME 304	3	
BME 462	3	
BME (TE) 466/ 566	3	
BME (TE) 467	3	
BME (BEC) 483/ 583	2	
BME 484	3	
MSE 490	1-4	
MSE 495	1-6	
MT 323	3	

MT 366	3	
MT 432	3	
MT (PCC) 471	3	
PSE 332	3	
PSE (CH) 335	4	
PSE 425	3	
GRP 080 - MSE Processing Elective (choose 1 course)		
MSE 440	3	
MSE 445	3	
MSE 455	3	
MSE 456	3	
MSE 460	3	
MSE 540	3	
MSE 545	3	
MSE 556	3	
Free Electives:		
Total credit hours under Major Field of Study: <i>Minimum 27 hours required in program area.</i>	98	
COLLEGE REQUIREMENTS:		
Orientation Course(s): E 101 and E 115	2	
Other: ENG 331 or ENG 333	3	Satisfies Communication in the Major GEP co-requisite
Total credit hours under College Requirements:	5	

NCSU GENERAL EDUCATION PROGRAM REQUIREMENTS <i>Courses in the Major and/or Minor may also fulfill a General Education requirement; however, a GEP category <u>may not be subset</u> to require a specific course from the category list. Required courses must be listed in the Major/College requirements.</i> Specific courses should not be listed in any of the fields below other than ENG 101.		At least one of the following must be listed: <ol style="list-style-type: none"> Choose course(s) from the University Approved GEP course list for this category. Minimum requirements are satisfied by Major/College course requirements. Major/College course requirement satisfies X credit hrs of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category. Co-requisite is satisfied by a Major/College course requirement. Choose course(s) from the University Approved GEP course lists for the Humanities/ Social Sciences/ Visual & Performing Arts. Choose course(s) from the University Approved GEP course lists for Natural Sciences/Mathematical Sciences.
General Education Program Requirements: <i>Minimum 39-40 hrs</i>	Credit hours	How will the GEP requirement be met? (Choose applicable statement from 1-6 listed above)
Mathematical Sciences <small>(At least 1 course with MA or ST prefix)</small> <small>Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.</small> <small>(6 credits)</small>	X	2. Minimum requirements are satisfied by Major/College course requirements.
Natural Sciences <small>(At least 1 lab course or course with a lab)</small> <small>Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.</small> <small>(7 credits)</small>	X	2. Minimum requirements are satisfied by Major/College course requirements.
English 101 (C- or better required) <small>(4 credits)</small>	4	ENG 101

Humanities <i>(Courses from two different disciplines)</i> <i>Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.</i>	(6 credits)	3-6	3. Course in the Major (PHI 214, PHI 221, STS/PHI 325, or PHI 375) satisfies 3 credit hrs. of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category
Social Sciences <i>(Courses from two different disciplines)</i> <i>Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.</i>	(6 credits)	3	3. Course in the Major (EC 205) satisfies 3 credit hrs. of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category
Additional Breadth <i>(Choose approach that is different from the approach of the Major)</i> <i>Major/College requirements cannot satisfy this requirement and an AB course cannot be double-counted except in satisfying the Global Knowledge or U.S. Diversity co-requisites.</i>	(3 credits)	3	5. Choose course(s) from the University Approved GEP course lists for the Humanities/Social Sciences/Visual and Performing Arts
Interdisciplinary Perspectives <i>Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.</i>	(5 credits)	3-6	3. Course in the Major (IDS 201, STS 302, STS 304, or STS/PHI 325) satisfies 3 credit hrs. of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category
Health and Exercise Studies <i>(Including one Fitness and Wellness course)</i>	(2 credits)	2	1. Choose course(s) from the University Approved GEP course list for this category.
Total credit hours needed to complete GEP that are not satisfied as part of the Major/College requirements.		23-24	
GEP Co-Requisites:			Courses taken in the Major, GEP, or Minor may double-count to fulfill the co-requisites. Courses that satisfy the U.S. Diversity or Global Knowledge co-requisite are marked on course lists with a "USD" or "GK" indicator.
U.S. Diversity co-requisite	(USD)	n/a	1. Choose course(s) from the University Approved GEP course list for this category.
Global Knowledge co-requisite (GK)		n/a	1. Choose course(s) from the University Approved GEP course list for this category.
Foreign Language Proficiency		n/a	Proficiency at the FL_102 level required.
The following requirements must be satisfied within the College/Program:			Place an X in the credit hour box to indicate below that the requirement is "Satisfied by College/Program Requirements"
Communication in the Major (Advanced Communication)		X	Satisfied by College/Program Requirements
Technology Fluency		X	Satisfied by College/Program Requirements
Total credit hours required to complete Degree: Total must be within 120-128 credit hours.		126-127	As applicable, indicate here the overall GPA requirement for degree completion including course completion.

CURRICULUM REQUIREMENTS

Format B - **CLEAN**

<u>Degree/Plan Title</u> : Bachelor of Science in Materials Science and Engineering	<u>Plan SIS Code</u> : 14MSEBS
Concentration/Subplan Title: Biomaterials	Subplan SIS Code: 14MSEBIO
<u>Indicate requirements status</u> : Current: Proposed: X <u>Proposed</u> Effective Semester: Fall 2021	
<u>New Degree Audit required?</u> (Y or N) Yes	
<u>Critical Path Courses</u> - Identify using the code (CP) which courses are considered critical path courses which represent specific major requirements that are predictive of student success in a given program/plan. Place the (CP) next to the credit hours for the course.	

MAJOR FIELD OF STUDY REQUIREMENTS:		
<i>Required Courses/Groups/ Electives:</i>	<i>Credit Hours</i>	<i>GEP category, if applicable</i>
Indicate if course or course groupings have a C-wall or MGPA requirement and which are considered Critical Path courses – indicate with (CP) next to applic. course.		List GEP category and hours satisfied by a Major requirement
MATH		
MA 141 (CP)	4	Mathematics (6 hours)
MA 241 (CP)	4	
MA 242 (CP)	4	
MA 341	3	
ST 370	3	
SCIENCES		
CH 101 (CP)	3	Natural Sciences (8 hours)
CH 102 (CP)	1	
CH 201	3	
CH 202	1	
CH 220 OR CH 221	3	
CH 222	1	
PY 205 (CP)	3	
PY 206 (CP)	1	
PY 208 (CP)	3	
PY 209 (CP)	1	
ECONOMICS		
EC 205 OR EC 201 OR ARE 201	3	Social Sciences (3 hours)
ETHICS		
IDS 201, STS 302, STS 304, STS/PHI 325, PHI 214, PHI 221, or PHI 375	3	Humanities and/or Interdisciplinary Perspective (3)
REQUIRED COURSES		
MSE 201 (CP)	3	

MSE 255	2	
MSE 260	3	
MSE 270	1	
MSE 300	3	
MSE 301	3	
MSE 320	3	
MSE 335	2	
MSE 355	3	
MSE 360	3	
MSE 370	3	
MSE 380	3	
MSE 420	3	
MSE 423	1	
MSE 470	3	
MSE 480	3	
Concentration Courses/Groups/Electives:	15	
<u>Biomaterials Concentration Courses</u>		
BIO 183	3	
MSE 485	3	
<u>Biomaterials Elective (5 credit hour minimum)</u>		
BCH 351	3	
BCH 451	3	
BEC (CHE) 462/562	3	
BEC (CHE) 488/588	2	
BIO 414	3	
BIT 410	4	
BIT (PO) 466/566	2	
BME (TE) 466/566	3	
BME (TE) 467	3	
BME (BEC) 483/583	2	
MSE 490	1-4	
MSE 495	1-6	
MT 323	3	
MT 366	3	
MT 432	3	
MT (PCC) 471	3	
PSE 332	3	

PSE (CH) 335	4	
PSE 425	3	
GRP 080 - MSE Processing Elective (choose 1 course)		
MSE 440	3	
MSE 445	3	
MSE 455	3	
MSE 456	3	
MSE 460	3	
MSE 540	3	
MSE 545	3	
MSE 556	3	
Free Electives:		
Total credit hours under Major Field of Study: <i>Minimum 27 hours required in program area.</i>	98	
COLLEGE REQUIREMENTS:		
Orientation Course(s): E 101 and E 115	2	
Other: ENG 331 or ENG 333	3	Satisfies Communication in the Major GEP co-requisite
Total credit hours under College Requirements:	5	

<p><u>NCSU GENERAL EDUCATION PROGRAM REQUIREMENTS</u></p> <p><i>Courses in the Major and/or Minor may also fulfill a General Education requirement; however, a GEP category <u>may not be subset</u> to require a specific course from the category list. Required courses must be listed in the Major/College requirements.</i></p> <p><i>Specific courses should not be listed in any of the fields below other than ENG 101.</i></p>			<p><u>At least one of the following must be listed:</u></p> <ol style="list-style-type: none"> Choose course(s) from the University Approved GEP course list for this category. Minimum requirements are satisfied by Major/College course requirements. Major/College course requirement satisfies X credit hrs of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category. Co-requisite is satisfied by a Major/College course requirement. Choose course(s) from the University Approved GEP course lists for the Humanities/ Social Sciences/ Visual & Performing Arts. Choose course(s) from the University Approved GEP course lists for Natural Sciences/Mathematical Sciences.
General Education Program Requirements: <i>Minimum 39-40 hrs</i>	Credit hours	How will the GEP requirement be met? (Choose applicable statement from 1-6 listed above)	
Mathematical Sciences <i>(6 credits)</i> (At least 1 course with MA or ST prefix) <i>Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.</i>	X	2. Minimum requirements are satisfied by Major/College course requirements.	
Natural Sciences <i>(7 credits)</i> (At least 1 lab course or course with a lab) <i>Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.</i>	X	2. Minimum requirements are satisfied by Major/College course requirements.	
English 101 (C- or better required) <i>(4 credits)</i>	4	ENG 101	
Humanities <i>(6 credits)</i> (Courses from two different disciplines) <i>Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.</i>	3-6	3. Course in the Major (PHI 214, PHI 221, STS/PHI 325, or PHI 375) satisfies 3 credit hrs. of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category	

Social Sciences <i>(Courses from two different disciplines)</i> <i>Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.</i>	(6 credits)	3	3. Course in the Major (EC 205) satisfies 3 credit hrs. of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category
Additional Breadth <i>(Choose approach that is different from the approach of the Major)</i> <i>Major/College requirements cannot satisfy this requirement and an AB course cannot be double-counted except in satisfying the Global Knowledge or U.S. Diversity co-requisites.</i>	(3 credits)	3	5. Choose course(s) from the University Approved GEP course lists for the Humanities/Social Sciences/Visual and Performing Arts
Interdisciplinary Perspectives <i>Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.</i>	(5 credits)	3-6	3. Course in the Major (IDS 201, STS 302, STS 304, or STS/PHI 325) satisfies 3 credit hrs. of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category
Health and Exercise Studies <i>(Including one Fitness and Wellness course)</i>	(2 credits)	2	1. Choose course(s) from the University Approved GEP course list for this category.
Total credit hours needed to complete GEP that are not satisfied as part of the Major/College requirements.		23-24	
GEP Co-Requisites:			Courses taken in the Major, GEP, or Minor may double-count to fulfill the co-requisites. Courses that satisfy the U.S. Diversity or Global Knowledge co-requisite are marked on course lists with a "USD" or "GK" indicator.
U.S. Diversity co-requisite	(USD)	n/a	1.Choose course(s) from the University Approved GEP course list for this category.
Global Knowledge co-requisite (GK)		n/a	1.Choose course(s) from the University Approved GEP course list for this category.
Foreign Language Proficiency		n/a	Proficiency at the FL_102 level required.
The following requirements must be satisfied within the College/Program:			Place an X in the credit hour box to indicate below that the requirement is "Satisfied by College/Program Requirements"
Communication in the Major (Advanced Communication)		X	Satisfied by College/Program Requirements
Technology Fluency		X	Satisfied by College/Program Requirements
Total credit hours required to complete Degree: Total must be within 120-128 credit hours.		126-127	As applicable, indicate here the overall GPA requirement for degree completion including course completion.

GEP FORMAT A - WITH MARK-UPS
(SEMESTER-BY-SEMESTER CURRICULUM DISPLAY)

Current:

Proposed: **X**

Proposed Effective Semester: **8/2021**

DEGREE TITLE: B.S. in Materials Science and Engineering: Nanomaterials

CONCENTRATION TITLE: n/a

CURRENT DEGREE KEY: 14MSEBS - 14MSENANO

FIRST YEAR

FALL	CR	SPRING	CR
CH 101 Chemistry, A Molecular Science ¹	3	CH 201 Chemistry, A Quant Science	3
CH 102 General Chemistry Lab ¹	1	CH 202 Quantitative Chemistry Lab	1
E 101 Intro. to Engr. & Problem Solving ^{1,2}	1	MA 241 Calculus II ¹	4
E 115 Intro to Computing Environ ^{1,2}	1	PY 205 Physics for Engineers & Scientists I ¹	3
ENG 101 Academic Writing and Research ^{1,2}	4	PY 206 Physics for Engineers & Scientists I Lab ¹	1
MA 141 Calculus I ¹	4	HES_***Health & Exercise Studies Course*	1
EC 205 Economics (or EC 201 or ARE 201)*	3	*** ** GEP Requirement*	3
	17		16

SECOND YEAR

FALL	CR	SPRING	CR
MSE 201 Structure & Prop. of Engr. Materials ¹	3	MSE 255 Exp Meth Struct Analysis of Matls	2
ST 370 Prob. and Statistics for Engineers	3	MSE 260 Math Methods for Material Engrs.	3
MA 242 Calculus III	4	MSE 270 MSE Seminar	1
PY 208 Physics for Engineers & Scientists II	3	CH 220 Intro Organic Chemistry (or CH 221)	4 3
PY 209 Physics for Eng. & Scientists II Lab	1	CH 222 Organic Chemistry I Lab	1
HES_***Health & Exercise Studies Course*	1	MA 341 Applied Differential Equations I	3
		*** ** GEP Requirement*	3
	15		16

THIRD YEAR

FALL	CR	SPRING	CR
MSE 300 Structure of Materials at Nanoscale	3	MSE 355 Elect, Mag & Opt Prop of Materials	3
MSE 301 Intro to Thermodynamics of Matls	3	MSE 360 Kinetic Process in Materials	3
MSE 320 Intro to Defects in Solids	3	MSE 370 Microstructure of Inorganic Materials	3
MSE 335 Exp Meth Analysis of Matls Prop.	2	MSE 380 Microstructure of Organic Materials	3
*** *** Technical or Nanomaterials Elective ^{3,5,6, 7}	3	MSE 465 Introduction to Nanomaterials	3
*** *** GEP Requirement*	3		
	17		15

FOURTH YEAR

FALL	CR	SPRING	CR
MSE 420 Mechanical Prop of Materials	3	MSE 470 Mat. Sci & Eng. Design Project	3
MSE 423 Intro. to Materials Eng. Design	1	MSE 480 Materials Forensics & Degradation	3
ENG 331 Technical Writing (or ENG 333)	3	*** *** GEP Requirement*	3
MSE_ *** MSE Processing Elective ⁵	3	*** *** Technical or Nanomaterials Concentration Elective ^{3,4}	3
*** *** Technical or Nanomaterials Concentration Elective ^{3,4}	3	*** *** Ethics Elective (GEP Requirement*) ⁸	3
*** *** GEP Requirement*	3		
	16		15

Minimum Credit Hours Required for Graduation*: **126**

Major/Program requirements and footnotes

- ¹ Courses required for Change of Degree Audit (CODA). CH 101, 102; MA 141, 241; PY 205, 206 must be completed with a C or higher.
- ² Minimum grade of C-, E 115 requires satisfactory completion (S).
- ³ Choose from the following list of nanomaterials concentration electives: CH 435, CH 437, CHE 460, CHE 465, CHE (ECE) 468/568, E 304, PY 407. Additional nanomaterials electives may be approved by the MSE Director of Undergraduate Programs.
- ⁴ Nanomaterials Concentration electives must total at least 6 credit hours.
- ⁵ Choose a course from the following list of MSE processing electives: MSE 440, MSE 445, MSE 455, MSE 456, MSE 460, MSE 540, MSE 545, or MSE 556. ~~This elective may be taken in the spring or fall semester by swapping it with a GEP requirement.~~

⁶ Choose any course from the following list of engineering electives: CE 214, CE 225, CSC 110, ECE 331, ISE 311, MAE 206, MAE 208, MAE 214, MSE(NE) 409/509, MSE 485, NE 202, or TE 205. Only 1 advisor approved MSE 490 (special topics) course may be used to fulfill a Nanomaterials Concentration elective or technical elective. Departmental approval is required for MSE 495.

⁷ Choose any course from the following list of technical electives: BCH 451, CH 223, CH 315, CH 401, MA 305, MA 351, MA 401, MA 402, MA 405, MEA 463, PY 328, PY 411/511, PY 412/512, PY 414/514, or PY 415/515.

⁸ Ethics course must be chosen from the following list: IDS 201, STS 302, STS 304, STS/PHI 325, PHI 214, PHI 221, or PHI 375. Course will fulfill 3 credits for the Interdisciplinary Perspective and/or the Humanities GEP requirement depending on the course selected.

***General Education Program (GEP) requirements and GEP Footnotes**

To complete the requirements for graduation and the General Education Program, the following credit hours and co-requisites must be satisfied. University approved GEP course lists for each of the following categories can be found at: <https://oucc.dasa.ncsu.edu/general-education-program/>.

- A. **Mathematical Sciences** – (6 credit hours – one course with MA or ST prefix)
Fulfilled as part of the Major requirements.
- B. **Natural Sciences**– (7 credit hours – include one laboratory course or course with a lab)
Fulfilled as part of the Major requirements.
- C. **Humanities**– (6 credit hours selected from two different disciplines/course prefixes)
Choose from the University approved GEP Humanities course list. PHI 214, PHI 221, PHI/STS 325, or PHI 375 taken as part of the Major requirements satisfies 3 credit hours of the 6 credit hours needed to fulfill the GEP Humanities requirement.
- D. **Social Sciences**– (6 credit hours selected from two different disciplines/course prefixes)
Choose 3 credits from the University approved GEP Social Sciences course list in a discipline other than Economics. Economics 205 (or EC 201 or ARE 201), taken as part of the Major requirements, satisfies 3 credit hours needed to fulfill the GEP Social Sciences requirement.
- E. **Physical Education**– (2 credit hours at least one 100-level Fitness and Wellness Course.
Choose from the University approved GEP Physical Education/Healthy Living course list.
- F. **Additional Breadth**– (3 credits to be selected from the following checked University approved GEP course lists)
Choose one course from Humanities, Social Sciences, or Visual and Performing Arts
- G. **Interdisciplinary Perspectives** (5-6 credit hours)
Choose from the University approved GEP Interdisciplinary Perspectives course list. IDS 201, STS 302, STS 304 or STS/PHI 325 taken as part of the Major requirements satisfies 3 credit hours of the 5 credit hours needed to fulfill the GEP Interdisciplinary Perspectives requirement.
- H. **Introduction to Writing** (4 credit hours satisfied by completing ENG 101 with a C- or better)

The following **co-requisites** must be satisfied to complete the General Education Program requirements

- I. **U.S. Diversity (USD)**
Choose from the University approved GEP U.S. Diversity course list or choose a course identified on the approved GEP course lists as meeting the U.S. Diversity (USD) co-requisite.
- J. **Global Knowledge (GK)**
Choose from the University approved GEP Global Knowledge course list or choose a course identified on the approved GEP course lists as meeting the Global Knowledge (GK) co-requisite.

K. **Foreign Language proficiency** at the FL_102 level will be required for graduation

GEP FORMAT A - CLEAN
(SEMESTER-BY-SEMESTER CURRICULUM DISPLAY)

Current: Proposed: **X** Proposed Effective Semester: **8/2021**

DEGREE TITLE: B.S. in Materials Science and Engineering: Nanomaterials

CONCENTRATION TITLE: n/a

CURRENT DEGREE KEY: 14MSEBS - 14MSENANO

FIRST YEAR

FALL	CR	SPRING	CR
CH 101 Chemistry, A Molecular Science ¹	3	CH 201 Chemistry, A Quant Science	3
CH 102 General Chemistry Lab ¹	1	CH 202 Quantitative Chemistry Lab	1
E 101 Intro. to Engr. & Problem Solving ^{1,2}	1	MA 241 Calculus II ¹	4
E 115 Intro to Computing Environ ^{1,2}	1	PY 205 Physics for Engineers & Scientists I ¹	3
ENG 101 Academic Writing and Research ^{1,2}	4	PY 206 Physics for Engineers & Scientists I Lab ¹	1
MA 141 Calculus I ¹	4	HES_***Health & Exercise Studies Course*	1
EC 205 Economics (or EC 201 or ARE 201)*	3	*** ** GEP Requirement*	3
	17		16

SECOND YEAR

FALL	CR	SPRING	CR
MSE 201 Structure & Prop. of Engr. Materials ¹	3	MSE 255 Exp Meth Struct Analysis of Matls	2
ST 370 Prob. and Statistics for Engineers	3	MSE 260 Math Methods for Material Engrs.	3
MA 242 Calculus III	4	MSE 270 MSE Seminar	1
PY 208 Physics for Engineers & Scientists II	3	CH 220 Intro Organic Chemistry (or CH 221)	3
PY 209 Physics for Eng. & Scientists II Lab	1	CH 222 Organic Chemistry I Lab	1
HES_***Health & Exercise Studies Course*	1	MA 341 Applied Differential Equations I	3
		*** ** GEP Requirement*	3
	15		16

THIRD YEAR

FALL	CR	SPRING	CR
MSE 300 Structure of Materials at Nanoscale	3	MSE 355 Elect, Mag & Opt Prop of Materials	3
MSE 301 Intro to Thermodynamics of Matls	3	MSE 360 Kinetic Process in Materials	3
MSE 320 Intro to Defects in Solids	3	MSE 370 Microstructure of Inorganic Materials	3
MSE 335 Exp Meth Analysis of Matls Prop.	2	MSE 380 Microstructure of Organic Materials	3
*** ** Technical Elective ^{3,5,6, 7}	3	MSE 465 Introduction to Nanomaterials	3
*** ** GEP Requirement*	3		
	17		15

FOURTH YEAR

FALL	CR	SPRING	CR
MSE 420 Mechanical Prop of Materials	3	MSE 470 Mat. Sci & Eng. Design Project	3
MSE 423 Intro. to Materials Eng. Design	1	MSE 480 Materials Forensics & Degradation	3
ENG 331 Technical Writing (or ENG 333)	3	*** ** GEP Requirement*	3
MSE_ *** MSE Processing Elective ⁵	3	*** ** Nanomaterials Concentration Elective ^{3,4}	3
*** ** Nanomaterials Concentration Elective ^{3,4}	3	*** ** Ethics Elective (GEP Requirement*) ⁸	3
*** ** GEP Requirement*	3		
	16		15

Minimum Credit Hours Required for Graduation*: **126**

Major/Program requirements and footnotes

¹ Courses required for Change of Degree Audit (CODA). CH 101, 102; MA 141, 241; PY 205, 206 must be completed with a C or higher.

² Minimum grade of C-, E 115 requires satisfactory completion (S).

³ Choose from the following list of nanomaterials concentration electives: CH 435, CH 437, CHE 460, CHE 465, CHE (ECE) 468/568, E 304, PY 407. Additional nanomaterials electives may be approved by the MSE Director of Undergraduate Programs.

⁴ Nanomaterials Concentration electives must total at least 6 credit hours.

⁵ Choose a course from the following list of MSE processing electives: MSE 440, MSE 445, MSE 455, MSE 456, MSE 460, MSE 540, MSE 545, or MSE 556.

⁶ Choose any course from the following list of engineering electives: CE 214, CE 225, CSC 110, ECE 331, ISE 311, MAE 206, MAE 208, MAE 214, MSE(NE) 409/509, MSE 485, NE 202, or TE 205. Only 1 advisor approved MSE 490

(special topics) course may be used to fulfill a Nanomaterials Concentration elective or technical elective.

Departmental approval is required for MSE 495.

⁷ Choose any course from the following list of technical electives: BCH 451, CH 223, CH 315, CH 401, MA 305, MA 351, MA 401, MA 402, MA 405, MEA 463, PY 328, PY 411/511, PY 412/512, PY 414/514, or PY 415/515.

⁸ Ethics course must be chosen from the following list: IDS 201, STS 302, STS 304, STS/PHI 325, PHI 214, PHI 221, or PHI 375. Course will fulfill 3 credits for the Interdisciplinary Perspective and/or the Humanities GEP requirement depending on the course selected.

***General Education Program (GEP) requirements and GEP Footnotes**

To complete the requirements for graduation and the General Education Program, the following credit hours and co-requisites must be satisfied. University approved GEP course lists for each of the following categories can be found at: <https://oucc.dasa.ncsu.edu/general-education-program/>.

- A. **Mathematical Sciences** – (6 credit hours – one course with MA or ST prefix)
Fulfilled as part of the Major requirements.
- B. **Natural Sciences**– (7 credit hours – include one laboratory course or course with a lab)
Fulfilled as part of the Major requirements.
- C. **Humanities**– (6 credit hours selected from two different disciplines/course prefixes)
Choose from the University approved GEP Humanities course list. PHI 214, PHI 221, PHI/STS 325, or PHI 375 taken as part of the Major requirements satisfies 3 credit hours of the 6 credit hours needed to fulfill the GEP Humanities requirement.
- D. **Social Sciences**– (6 credit hours selected from two different disciplines/course prefixes)
Choose 3 credits from the University approved GEP Social Sciences course list in a discipline other than Economics. Economics 205 (or EC 201 or ARE 201), taken as part of the Major requirements, satisfies 3 credit hours needed to fulfill the GEP Social Sciences requirement.
- E. **Physical Education**– (2 credit hours at least one 100-level Fitness and Wellness Course.
Choose from the University approved GEP Physical Education/Healthy Living course list.
- F. **Additional Breadth**– (3 credits to be selected from the following checked University approved GEP course lists)
Choose one course from Humanities, Social Sciences, or Visual and Performing Arts
- G. **Interdisciplinary Perspectives** (5-6 credit hours)
Choose from the University approved GEP Interdisciplinary Perspectives course list. IDS 201, STS 302, STS 304 or STS/PHI 325 taken as part of the Major requirements satisfies 3 credit hours of the 5 credit hours needed to fulfill the GEP Interdisciplinary Perspectives requirement.
- H. **Introduction to Writing** (4 credit hours satisfied by completing ENG 101 with a C- or better)

The following **co-requisites** must be satisfied to complete the General Education Program requirements

- I. **U.S. Diversity (USD)**
Choose from the University approved GEP U.S. Diversity course list or choose a course identified on the approved GEP course lists as meeting the U.S. Diversity (USD) co-requisite.
- J. **Global Knowledge (GK)**
Choose from the University approved GEP Global Knowledge course list or choose a course identified on the approved GEP course lists as meeting the Global Knowledge (GK) co-requisite.
- K. **Foreign Language proficiency** at the FL_102 level will be required for graduation

CURRICULUM REQUIREMENTS

Format B - WITH MARK-UPS

<u>Degree/Plan Title</u> : Bachelor of Science in Materials Science and Engineering	<u>Plan SIS Code</u> : 14MSEBS
Concentration/Subplan Title: Nanomaterials	Subplan SIS Code: 14MSENANO
<u>Indicate requirements status</u> : Current: Proposed: X	<u>Proposed</u> Effective Semester: Fall 2021
<u>New Degree Audit required?</u> (Y or N) Yes	
<p><u>Critical Path Courses</u> - Identify using the code (CP) which courses are considered critical path courses which represent specific major requirements that are predictive of student success in a given program/plan. Place the (CP) next to the credit hours for the course.</p>	

MAJOR FIELD OF STUDY REQUIREMENTS:		
Required Courses/Groups/ Electives:	Credit Hours	GEP category, if applicable
Indicate if course or course groupings have a C-wall or MGPA requirement and which are considered Critical Path courses – indicate with (CP) next to applic. course.		List GEP category and hours satisfied by a Major requirement
MATH		
MA 141 (CP)	4	Mathematics (6 hours)
MA 241 (CP)	4	
MA 242 (CP)	4	
MA 341	3	
ST 370	3	
SCIENCES		
CH 101 (CP)	3	Natural Sciences (8 hours)
CH 102 (CP)	1	
CH 201	3	
CH 202	1	
CH 220 OR CH 221	4 3	
CH 222	1	
PY 205 (CP)	3	
PY 206 (CP)	1	
PY 208 (CP)	3	
PY 209 (CP)	1	
ECONOMICS		
EC 205 OR EC 201 OR ARE 201	3	Social Sciences (3 hours)
ETHICS		
IDS 201, STS 302, STS 304, STS/PHI 325, PHI 214, PHI 221, or PHI 375	3	Humanities and/or Interdisciplinary Perspective (3)
REQUIRED COURSES		
MSE 201 (CP)	3	

MSE 255	2	
MSE 260	3	
MSE 270	1	
MSE 300	3	
MSE 301	3	
MSE 320	3	
MSE 335	2	
MSE 355	3	
MSE 360	3	
MSE 370	3	
MSE 380	3	
MSE 420	3	
MSE 423	1	
MSE 470	3	
MSE 480	3	
<u>Concentration Courses/Groups/Electives:</u>	15	
<u>Nanomaterials Concentration Courses</u>		
MSE 465	3	
<u>Nanomaterials Elective (6 credit hour minimum)</u>		
CH 435	3	
CH 437	4	
CHE 460	3	
CHE 465	3	
CHE (ECE) 468/568	3	
E 304	3	
PY 407	3	
<u>GRP 080 - MSE Processing Elective (choose 1 course)</u>		
MSE 440	3	
MSE 445	3	
MSE 455	3	
MSE 456	3	
MSE 460	3	
MSE 540	3	
MSE 545	3	
MSE 556	3	
<u>GRP 061 - Engineering Elective</u>		
Any MSE processing elective		

CE 214	3	
CE 225	3	
CSC 110	3	
ECE 331	3	
ISE 311	3	
MAE 206	3	
MAE 208	3	
MAE 214	3	
MSE 485	3	
MSE (NE) 409/509	3	
MSE 490	1-4	
MSE 495	1-6	
NE 202	4	
TE 205	4	
GRP 071 - Technical Electives (choose 3 courses)		
Any MSE processing elective		
Any engineering elective		
BCH 451	4	
CH 223	3	
CH 315	3	
CH 401	3	
MA 305	3	
MA 351	3	
MA 401	3	
MA 402	3	
MA 405	3	
MEA PY 463	3	
PY 328	3	
PY 407	3	
PY 411	3	
PY 412	3	
PY 414	3	
PY 415	3	
PY 511	3	
PY 512	3	

PY 514	3	
PY 515	3	

<u>NCSU GENERAL EDUCATION PROGRAM REQUIREMENTS</u> <i>Courses in the Major and/or Minor may also fulfill a General Education requirement; however, a GEP category <u>may not be subset</u> to require a specific course from the category list. Required courses must be listed in the Major/College requirements.</i> <i>Specific courses should not be listed in any of the fields below other than ENG 101.</i>		<u>At least one of the following must be listed:</u> 1. Choose course(s) from the University Approved GEP course list for this category. 2. Minimum requirements are satisfied by Major/College course requirements. 3. Major/College course requirement satisfies X credit hrs of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category. 4. Co-requisite is satisfied by a Major/College course requirement. 5. Choose course(s) from the University Approved GEP course lists for the Humanities/ Social Sciences/ Visual & Performing Arts. 6. Choose course(s) from the University Approved GEP course lists for Natural Sciences/Mathematical Sciences.
General Education Program Requirements: <i>Minimum 39-40 hrs</i>	Credit hours	How will the GEP requirement be met? (Choose applicable statement from 1-6 listed above)
Mathematical Sciences (6 credits) (At least 1 course with MA or ST prefix) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	X	2. Minimum requirements are satisfied by Major/College course requirements.
Natural Sciences (7 credits) (At least 1 lab course or course with a lab) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	X	2. Minimum requirements are satisfied by Major/College course requirements.
English 101 (C- or better required) (4 credits)	4	ENG 101
Humanities (6 credits) (Courses from two different disciplines) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	3-6	3. Course in the Major (PHI 214, PHI 221, STS/PHI 325, or PHI 375) satisfies 3 credit hrs. of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category
Social Sciences (6 credits) (Courses from two different disciplines) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	3	3. Course in the Major (EC 205) satisfies 3 credit hrs. of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category
Additional Breadth (3 credits) (Choose approach that is different from the approach of the Major) Major/College requirements cannot satisfy this requirement and an AB course cannot be double-counted except in satisfying the Global Knowledge or U.S. Diversity co-requisites.	3	5. Choose course(s) from the University Approved GEP course lists for the Humanities/Social Sciences/Visual and Performing Arts
Interdisciplinary Perspectives (5 credits) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	3-6	3. Course in the Major (IDS 201, STS 302, STS 304, or STS/PHI 325) satisfies 3 credit hrs. of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category
Health and Exercise Studies (2 credits) (Including one <i>Fitness and Wellness</i> course)	2	1. Choose course(s) from the University Approved GEP course list for this category.
Total credit hours needed to complete GEP that are <u>not</u> satisfied as part of the Major/College requirements.	23-24	
GEP Co-Requisites:		Courses taken in the Major, GEP, or Minor may double-count to fulfill the co-requisites. Courses that satisfy the U.S. Diversity or Global Knowledge co-requisite are marked on course lists with a "USD" or "GK" indicator.
U.S. Diversity co-requisite (USD)	n/a	1.Choose course(s) from the University Approved GEP course list for this category.
Global Knowledge co-requisite (GK)	n/a	1.Choose course(s) from the University Approved GEP course list for this category.
Foreign Language Proficiency	n/a	Proficiency at the FL_102 level required.
The following requirements must be satisfied within the College/Program:		Place an X in the credit hour box to indicate below that the requirement is "Satisfied by College/Program Requirements"
Communication in the Major (Advanced Communication)	X	Satisfied by College/Program Requirements

Technology Fluency	X	Satisfied by College/Program Requirements
Total credit hours required to complete Degree: Total must be within 120-128 credit hours.	126-127	As applicable, indicate here the overall GPA requirement for degree completion including course completion.

CURRICULUM REQUIREMENTS

Format B - **CLEAN**

<u>Degree/Plan Title:</u> Bachelor of Science in Materials Science and Engineering	<u>Plan SIS Code:</u> 14MSEBS
Concentration/Subplan Title: Nanomaterials	Subplan SIS Code: 14MSENANO
<u>Indicate requirements status:</u> Current: Proposed: X <u>Proposed</u> Effective Semester: Fall 2021	
<u>New Degree Audit required?</u> (Y or N) Yes	
<u>Critical Path Courses</u> - Identify using the code (CP) which courses are considered critical path courses which represent specific major requirements that are predictive of student success in a given program/plan. Place the (CP) next to the credit hours for the course.	

MAJOR FIELD OF STUDY REQUIREMENTS:		
<i>Required Courses/Groups/ Electives:</i>	<i>Credit Hours</i>	<i>GEP category, if applicable</i>
Indicate if course or course groupings have a C-wall or MGPA requirement and which are considered Critical Path courses – indicate with (CP) next to applic. course.		List GEP category and hours satisfied by a Major requirement
MATH		
MA 141 (CP)	4	Mathematics (6 hours)
MA 241 (CP)	4	
MA 242 (CP)	4	
MA 341	3	
ST 370	3	
SCIENCES		
CH 101 (CP)	3	Natural Sciences (8 hours)
CH 102 (CP)	1	
CH 201	3	
CH 202	1	
CH 220 OR CH 221	3	
CH 222	1	
PY 205 (CP)	3	
PY 206 (CP)	1	
PY 208 (CP)	3	
PY 209 (CP)	1	
ECONOMICS		
EC 205 OR EC 201 OR ARE 201	3	Social Sciences (3 hours)
ETHICS		
IDS 201, STS 302, STS 304, STS/PHI 325, PHI 214, PHI 221, or PHI 375	3	Humanities and/or Interdisciplinary Perspective (3)
REQUIRED COURSES		
MSE 201 (CP)	3	
MSE 255	2	

MSE 260	3	
MSE 270	1	
MSE 300	3	
MSE 301	3	
MSE 320	3	
MSE 335	2	
MSE 355	3	
MSE 360	3	
MSE 370	3	
MSE 380	3	
MSE 420	3	
MSE 423	1	
MSE 470	3	
MSE 480	3	
<u>Concentration Courses/Groups/Electives:</u>	15	
<u>Nanomaterials Concentration Courses</u>		
MSE 465	3	
<u>Nanomaterials Elective (6 credit hour minimum)</u>		
CH 435	3	
CH 437	4	
CHE 460	3	
CHE 465	3	
CHE (ECE) 468/568	3	
E 304	3	
PY 407	3	
<u>GRP 080 - MSE Processing Elective (choose 1 course)</u>		
MSE 440	3	
MSE 445	3	
MSE 455	3	
MSE 456	3	
MSE 460	3	
MSE 540	3	
MSE 545	3	
MSE 556	3	
<u>GRP 061 - Engineering Elective</u>		
Any MSE processing elective		

CE 214	3	
CE 225	3	
CSC 110	3	
ECE 331	3	
ISE 311	3	
MAE 206	3	
MAE 208	3	
MAE 214	3	
MSE 485	3	
MSE (NE) 409/509	3	
MSE 490	1-4	
MSE 495	1-6	
NE 202	4	
TE 205	4	
GRP 071 - Technical Electives (choose 3 courses)		
Any MSE processing elective		
Any engineering elective		
BCH 451	4	
CH 223	3	
CH 315	3	
CH 401	3	
MA 305	3	
MA 351	3	
MA 401	3	
MA 402	3	
MA 405	3	
MEA 463	3	
PY 328	3	
PY 407	3	
PY 411	3	
PY 412	3	
PY 414	3	
PY 415	3	
PY 511	3	
PY 512	3	

PY 514	3	
PY 515	3	

<u>NCSU GENERAL EDUCATION PROGRAM REQUIREMENTS</u> <i>Courses in the Major and/or Minor may also fulfill a General Education requirement; however, a GEP category <u>may not be subset</u> to require a specific course from the category list. Required courses must be listed in the Major/College requirements.</i> <i>Specific courses should not be listed in any of the fields below other than ENG 101.</i>		<u>At least one of the following must be listed:</u> 7. Choose course(s) from the University Approved GEP course list for this category. 8. Minimum requirements are satisfied by Major/College course requirements. 9. Major/College course requirement satisfies X credit hrs of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category. 10. Co-requisite is satisfied by a Major/College course requirement. 11. Choose course(s) from the University Approved GEP course lists for the Humanities/ Social Sciences/ Visual & Performing Arts. 12. Choose course(s) from the University Approved GEP course lists for Natural Sciences/Mathematical Sciences.
General Education Program Requirements: <i>Minimum 39-40 hrs</i>	Credit hours	How will the GEP requirement be met? (Choose applicable statement from 1-6 listed above)
Mathematical Sciences (6 credits) (At least 1 course with MA or ST prefix) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	X	2. Minimum requirements are satisfied by Major/College course requirements.
Natural Sciences (7 credits) (At least 1 lab course or course with a lab) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	X	2. Minimum requirements are satisfied by Major/College course requirements.
English 101 (C- or better required) (4 credits)	4	ENG 101
Humanities (6 credits) (Courses from two different disciplines) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	3-6	3. Course in the Major (PHI 214, PHI 221, STS/PHI 325, or PHI 375) satisfies 3 credit hrs. of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category
Social Sciences (6 credits) (Courses from two different disciplines) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	3	3. Course in the Major (EC 205) satisfies 3 credit hrs. of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category
Additional Breadth (3 credits) (Choose approach that is different from the approach of the Major) Major/College requirements cannot satisfy this requirement and an AB course cannot be double-counted except in satisfying the Global Knowledge or U.S. Diversity co-requisites.	3	5. Choose course(s) from the University Approved GEP course lists for the Humanities/Social Sciences/Visual and Performing Arts
Interdisciplinary Perspectives (5 credits) Course(s) in the Major may double-count to satisfy this requirement and also satisfy either the Global Knowledge or U.S. Diversity co-requisites.	3-6	3. Course in the Major (IDS 201, STS 302, STS 304, or STS/PHI 325) satisfies 3 credit hrs. of this requirement. Remaining hours required must be chosen from the University Approved GEP course list for the category
Health and Exercise Studies (2 credits) (Including one <i>Fitness and Wellness</i> course)	2	1. Choose course(s) from the University Approved GEP course list for this category.
Total credit hours needed to complete GEP that are <u>not</u> satisfied as part of the Major/College requirements.	23-24	
GEP Co-Requisites:		Courses taken in the Major, GEP, or Minor may double-count to fulfill the co-requisites. Courses that satisfy the U.S. Diversity or Global Knowledge co-requisite are marked on course lists with a "USD" or "GK" indicator.
U.S. Diversity co-requisite (USD)	n/a	1.Choose course(s) from the University Approved GEP course list for this category.
Global Knowledge co-requisite (GK)	n/a	1.Choose course(s) from the University Approved GEP course list for this category.
Foreign Language Proficiency	n/a	Proficiency at the FL_102 level required.
The following requirements must be satisfied within the College/Program:		Place an X in the credit hour box to indicate below that the requirement is "Satisfied by College/Program Requirements"
Communication in the Major (Advanced Communication)	X	Satisfied by College/Program Requirements
Technology Fluency	X	Satisfied by College/Program Requirements

Total credit hours required to complete Degree:
Total must be within 120-128 credit hours.

126-127

As applicable, indicate here the overall GPA requirement for degree completion including course completion.