

UNIVERSITY CURRICULUM COMMITTEE AGENDA
 2:00 p.m., Friday, April 14, 2017
 106 Administration, Provost Conference Room

Note: If you are unable to attend or will be sending a substitute, please notify [Carole Makela](mailto:Carole.Makela@colostate.edu) (1-5141) or [Curriculum Catalog@colostate.edu](mailto:Curriculum_Catalog@colostate.edu) (1-2429) prior to the meeting.

MINUTES – Minutes of April 7, 2017.

ANNOUNCEMENTS

1. **New Graduate Certificate Proposals – Status Update:** Graduate certificates composed of 50% or more new courses developed specifically for the program have to be submitted to the Higher Learning Commission (HLC) for full review. Full HLC review took just over two months for the two graduate certificates submitted last summer (submitted 6/17/16; approved 8/19/16). We then have to notify the CDHE so they can add the certificates to the [CDHE website](#) (this usually happens within 1 week after BOG approval).

New Graduate Certificates	Proposed Effective Term	CoSRGE Approval	UCC Approval Date	Faculty Council Approval	HLC Approval	BoG Approval	CDHE Approval
High Impact On-Demand Learning Solutions	Fall 2017	11/3/2016	11/11/2016	2/7/2017	Submitted for full HLC Review 4/7/17 (100% new courses: 3/3)	On 5/3/17 agenda	Submitted after BOG approval
Conservation Actions with Lands, Animals, & People	Fall 2017	10/6/2016	1/20/2017	2/7/2017	4/7/2017	On 5/3/17 agenda	Submitted after BOG approval
Business Analytics & Accounting Systems	Fall 2017	12/1/2016	1/20/2017	2/7/2017	4/7/2017	On 5/3/17 agenda	Submitted after BOG approval
Adventure Tourism	Fall 2017	12/1/2016	1/20/2007	2/7/2017	Submitted for full HLC Review 4/7/17 (100% new courses: 6/6)	On 5/3/17 agenda	Submitted after BOG approval
Facilitating Adult Learning	Spring 2018	2/2/2017	3/3/2017	4/4/2017	4/7/2017	On 5/3/17 agenda	Submitted after BOG approval
TESOL Education	Spring 2018	2/2/2017	3/3/2017	4/4/2017	4/7/2017	On 5/3/17 agenda	Submitted after BOG approval
Agritourism Management	Fall 2017	2/2/2017	3/3/2017	4/4/2017	Submitted for full HLC Review 4/7/17 (50% NEW courses: 3/6)	On 5/3/17 agenda	Submitted after BOG approval
Nutrition Sciences	Fall 2017	3/2/2017	3/10/2017	4/4/2017	Submitted for full HLC Review 4/7/17 (100% new courses: 3/3)	On 5/3/17 agenda	Submitted after BOG approval
Graduate Certificate in Teaching in Extension	Spring 2018	4/6/2017	4/14/2017 agenda	Possibly 5/2/17 agenda	May need full HLC review after Faculty Council approval	Possibly 8/2/17 agenda	Submitted after BOG approval

2. The Executive Committee placed 3/31 UCC minutes on the 5/2/17 Faculty Council meeting.
3. The Executive Committee will hear a report next meeting (4/18) on the exam proctoring issues (including paying for it) and recommendations from the Committee on Teaching and Learning—will provide update as to nature of their recommendations and actions that may go forward to Faculty Council after that meeting.

4. Please think of issues to share at our 4/14 meeting so that any research/background that may be needed can be gathered for discussion at our last 2 meetings of the semester. This scheduling will allow having few course and proposals to take to the Executive Committee at the end of the semester for their approval to assure inclusion in the upcoming catalog. Any last minute CIM proposals that come in will likely be held for the first meeting of UCC in August. We will also be reviewing the curriculum calendar/due dates for 17-18 and the 2016-17 UCC Annual Report.

CONSENT AGENDA

See listing after New Business.

CIM Considerations

CIM Forms
CIM Processes
CIM Help Bubble

PENDING CoSRGE

New degree proposal:

(Changing from Specialization under Master of Education in Education and Human Resources Studies to separate degree)

- [Master of Arts in Counseling and Career Development](#)
- [Master of Arts in Counseling and Career Development, Career Counseling Specialization](#)
- [Master of Arts in Counseling and Career Development, School Counseling Specialization](#)
- [Master of Arts in Counseling and Career Development, Clinical Mental Health Counseling Specialization, Plan B](#)

Deactivation proposals:

- [Master of Science in Food Science and Nutrition, Nutrition and Exercise Science Specialization, Plan A](#)
- [Master of Science in Food Science and Nutrition, Nutrition and Exercise Science Specialization, Plan B](#)
- [Master of Science in Health and Exercise Science, Exercise Science and Nutrition Specialization, Plan A](#)

OTHER BUSINESS

1. Discussion Item: UCC Committee Responsibilities and Operating Procedures

[UCC Committee Responsibilities – Faculty Manual Section C:](#)

k. University Curriculum Committee (last revised June 22, 2006)

The University Curriculum Committee shall consist of one (1) faculty representative from each college and the Libraries, one (1) undergraduate student, one (1) graduate student, and the Provost or his or her designee (ex officio). The duties of this standing committee shall be:

1. To receive or initiate recommendations pertaining to each and every course and program offered for academic credit by any unit of the University.
2. To evaluate all proposals for new undergraduate courses and programs as well as changes in existing courses and programs for correlation with other departments before consideration and approval by the Faculty Council.
3. To evaluate all proposals for new graduate courses and programs as well as changes in existing courses and programs for correlation with other departments. Review of graduate programs is conducted after the Committee on Scholarship, Research, and Graduate Education has recommended approval prior to their submission to the Faculty Council for approval.
4. To develop necessary administrative procedures for informing interested colleges concerning courses under consideration.
5. To evaluate proposals for the establishment of new departments, and the change of academic name, change in college affiliation, dissolution, division, or merger of existing departments.
6. To recommend policies to the Faculty Council related to the operations of the Division of Continuing Education which impact curricula.



OLD BUSINESS

Major Changes to Existing Programs

College of Engineering
 Department of Electrical and Computer Engineering
 Major in Electrical Engineering, Lasers and Optical Engineering Concentration

Effective Fall 2017

[Link to CIM](#)

Reason See CIM form.
for
Request:

Effective Fall 2017 ~~2016~~

In order to maintain professional standards required of practicing engineers, the Department of Electrical and Computer Engineering requires a cumulative grade point average of at least 2.000 in Electrical Engineering courses as a graduation requirement. It is the responsibility of any student who fails to maintain a 2.000 average to work with his or her advisor to correct grade point deficiencies. In addition, it is required that students retake any Electrical Engineering course at the 300 level or below in which they receive a grade below a C.

FRESHMAN		AUCC	CREDITS
<u>CO 150</u>	College Composition (GT-CO2)	1A	3
Select one group from the following: ¹			3-4
Group A:			
<u>CS 155</u>	Introduction to Unix		
<u>CS 156</u>	Introduction to C Programming I		
<u>CS 157</u>	Introduction to C Programming II		
Group B:			
<u>CS 163</u> or <u>164</u>	Java (CS1) No Prior Programming Java (CS1) Prior Programming		
<u>ECE 102</u>	Digital Circuit Logic		4
<u>ECE 103</u>	DC Circuit Analysis		3
<u>MATH 160</u>	Calculus for Physical Scientists I (GT-MA1)	1B	4
<u>MATH 161</u>	Calculus for Physical Scientists II (GT-MA1)	1B	4
<u>PH 141</u>	Physics for Scientists and Engineers I (GT-SC1)	3A	5
<u>Historical Perspectives</u>		3D	3
<u>Electives</u> ²		-	<u>3-4</u>
Additional Requirements for Graduation ^{3,2}			0
Total Credits			<u>33</u>29-30
SOPHOMORE			
<u>CHEM 111</u>	General Chemistry I (GT-SC2)	3A	4
<u>ECE 202</u>	Circuit Theory Applications		4
<u>ECE 303/STAT 303</u>	Introduction to Communications Principles		3

<u>ECON 202</u>	Principles of Microeconomics (GT-SS1)	3C	3
<u>MATH 261</u>	Calculus for Physical Scientists III		4
Select one from the following:			4
<u>MATH 340</u>	Introduction to Ordinary Differential Equations		
<u>MATH 345</u>	Differential Equations		
<u>PH 142</u>	Physics for Scientists and Engineers II (GT-SC1)	3A	5
<u>PH 314</u>	Introduction to Modern Physics		4
Additional Requirements for Graduation ³²			0
Total Credits			31
JUNIOR			
Select one from the following:			3
<u>CO 301B</u>	Writing in the Disciplines: Sciences (GT-CO3)	2	
<u>JTC 300</u>	Professional and Technical Communication (GT-CO3)	2	
<u>ECE 311</u>	Linear System Analysis I		3
<u>ECE 331</u>	Electronics Principles I		4
<u>ECE 332</u>	Electronics Principles II	4A	4
<u>ECE 341</u>	Electromagnetic Fields and Devices I		3
<u>ECE 342</u>	Electromagnetic Fields and Devices II		3
<u>PH 353</u>	Optics and Waves		4
<u>Arts and Humanities</u>		3B	3
<u>Global and Cultural Awareness</u>		3E	3
Science/Engineering Elective (see list below)			3
Additional Requirements for Graduation ³²			0
Total Credits			33
SENIOR			
<u>ECE 401</u> ⁴³	Senior Design Project I	4A,4B	3
<u>ECE 402</u>	Senior Design Project II	4C	3
<u>ECE 404</u>	Experiments in Optical Electronics		2
<u>ECE 441</u>	Optical Electronics		3
<u>ECE 457</u>	Fourier Optics		3
<u>PH 451</u>	Introductory Quantum Mechanics I		3
Technical Electives (see list below)			12
<u>Arts and Humanities</u>		3B	3
Additional Requirements for Graduation ³²			0
Total Credits			32

Program Total Credits:

~~129~~125-126

Science/Engineering Electives

Code	Title	Credits
<u>BC 351</u>	Principles of Biochemistry	4
<u>BIOM 306/BTEC 306</u>	Bioprocess Engineering	4
<u>BMS 300</u>	Principles of Human Physiology	4
<u>BMS 301</u>	Human Gross Anatomy	5
<u>BMS 325</u>	Cellular Neurobiology	3
<u>BMS 345</u>	Functional Neuroanatomy	4
<u>BZ 310</u>	Cell Biology	4
<u>CHEM 112</u>	General Chemistry Lab I (GT-SC1)	1
<u>CHEM 245</u>	Fundamentals of Organic Chemistry	4
<u>CHEM 246</u>	Fundamentals of Organic Chemistry Laboratory	1
<u>CIVE 260</u>	Engineering Mechanics-Statics	3
<u>CS 122/MATH 122</u>	Theory for Introductory Programming	1
<u>CS 155</u>	Introduction to Unix ¹	1
<u>CS 156</u>	Introduction to C Programming I ¹	1
<u>CS 157</u>	Introduction to C Programming II ¹	1
<u>CS 161</u>	Object-Oriented Problem Solving	4
<u>CS 165</u> or <u>CS 200</u>	Java (CS2) Data Structures and Algorithms Algorithms and Data Structures	4
<u>CS 220</u>	Discrete Structures and their Applications	4
<u>CS 253</u>	Software Development with C++	4
<u>CS 370</u>	Operating Systems	3
May select any course from the following:		Var.
<u>ECE 395A</u>	Independent Study ^{S4}	<u>1-6</u>
<u>ECE 395B</u>	Independent Study: Open Option Project ^{S4}	<u>1-6</u>
<u>ECE 395C</u>	Independent Study : Vertically Integrated Project ^{S4}	<u>1-6</u>
<u>HES 307</u>	Biomechanical Principles of Human Movement	4
<u>LIFE 103</u>	Biology of Organisms-Animals and Plants	4
<u>MATH 151</u>	Mathematical Algorithms in Matlab I	1
<u>MATH 229</u>	Matrices and Linear Equations	2
<u>MATH 332</u>	Partial Differential Equations	3
<u>MATH 366</u>	Introduction to Abstract Algebra	3
<u>MATH 369</u>	Linear Algebra I	3
<u>MECH 237</u> or <u>MECH 337</u>	Introduction to Thermal Sciences Thermodynamics	3
<u>MECH 303</u>	Energy Engineering	3
<u>MIP 300</u>	General Microbiology	3

Code	Title	Credits
<u>PH 341</u>	Mechanics	4
<u>PH 353</u>	Optics and Waves	4

Technical Electives

Code	Title	Credits
<u>BIOM 526/ECE 526</u>	Biological Physics	3
<u>BIOM 570/MECH 570</u>	Bioengineering	3
<u>ECE 411</u>	Control Systems	4
<u>ECE 412</u>	Digital Control and Digital Filters	3
<u>ECE 444</u>	Antennas and Radiation	3
<u>ECE 450</u>	Digital System Design Laboratory	1
<u>ECE 451</u>	Digital System Design	3
<u>ECE 461</u>	Power Systems	3
<u>ECE 462</u>	Power Systems Laboratory	1
<u>ECE 471A</u>	Semiconductor Physics	1
<u>ECE 471B</u>	Semiconductor Junctions	1
<i>May select any course from the following:</i>		Var.
<u>ECE 495A</u>	Independent Study ⁵⁴	<u>1-6</u>
<u>ECE 495B</u>	Independent Study: Open Option Project ⁵⁴	<u>1-6</u>
<u>ECE 495C</u>	Independent Study: Vertically Integrated Projects ⁵⁴	<u>1-6</u>
<u>ECE 503</u>	Ultrafast Optics	3
<u>ECE 504</u>	Physical Optics	3
<u>ECE 505</u>	Nanostructures: Fundamentals and Applications	3
<u>ECE 506</u>	Optical Interferometry and Laser Metrology	3
<u>ECE 507</u>	Plasma Physics and Applications	3
<u>ECE 520</u>	Optimization Methods-Control and Communication	3
<u>ECE 546</u>	Laser Fundamentals and Devices	3
<u>ECE 571</u>	VLSI System Design	3
<u>ECE 572</u>	Semiconductor Transistors	1
<u>ECE 573</u>	Semiconductor Optoelectronics Laboratory	3
<u>ECE 574</u>	Optical Properties in Solids	3
<u>ECE 575</u>	Experiments in VLSI System Design I	1
ECE 58* Experimental Courses in Lasers/Optics Topics		
<u>MATH 419</u>	Introduction to Complex Variables	3
<u>PH 315</u>	Modern Physics Laboratory	2
<u>PH 425</u>	Advanced Physics Laboratory	2
<u>PH 452</u>	Introductory Quantum Mechanics II	3

Code	Title	Credits
PH 462	Statistical Physics	3

¹ [CS 155](#), [CS 156](#), and [CS 157](#) count as Science/Engineering electives ONLY when [CS 163](#) or [CS 164](#) is also taken. [CS 163](#) or [CS 164](#) will be applied to the freshman year selection requirement.

² [Free elective credits can be satisfied by completing courses 100 level or above. Students use up to 4 credits of free electives to reach the required total of 129 program credits](#)

³² Students are required to participate in the Professional Learning Institute (PLI) program as a requirement for graduation. The program consists of eleven PLI workshops distributed by focus areas as follows: Global and Cultural Diversity (2 workshops), Innovation (2 workshops), Leadership (2 workshops), Civic and Public Engagement (2 workshops), and Ethics (3 workshops). Each workshop is between 1-2 hours long and no outside preparation is required to attend any of the workshops. Attendance at the required workshops may be spread over the student's four-year program.

⁴³ Project must be a laser and optical engineering topic.

⁵⁴ A total 3 credits of Independent Study may apply toward degree requirements. This includes credit awarded for [ECE 395A](#), [ECE 395B](#), [ECE 395C](#) and [ECE 495A](#), [ECE 495B](#), [ECE 495C](#) combined.



NEW BUSINESS

<i>New Courses</i>		<i>Effective Term</i>	<i>Notations</i>
COLLEGE OF NATURAL SCIENCES			
CS 445	CS 445 Introduction to Machine Learning 4(3-2-0) S Prerequisite: CS 320 with a C or better. Registration Information: Must register for lecture and laboratory. Sophomore standing. Sections may be offered: Online. Credit allowed for only one of the following: CS 445, CS 480A3, or DSCI 445. Description: Fundamental concepts and methods of computational data analysis, including pattern classification, prediction, visualization, and recent topics in deep learning. Grade Mode: Traditional.	Spring 2018	<i>Elective</i>
Reason for Request:	Machine learning is currently only taught at the graduate level. It is becoming increasingly important in industry, particularly for devices that "learn" and interact with the environment. A machine learning course at the 400-level would benefit our undergraduate students as they prepare for work in modern software development. This course has been taught successfully twice experimentally as CS480A3.		
DSCI 369	DSCI 369 Linear Algebra for Data Science 4(4-0-0) F Prerequisite: MATH 124; MATH 126. Registration Information: None. Description: Techniques in linear algebra related to data science. Matrices, bases, subspaces, linear independence, dimension, change of basis, projections, linear systems of equations, least squares, matrix factorizations. Singular value decomposition, angles between subspaces. Grade Mode: Traditional.	Fall 2018	<i>Required</i> <i>Data Science major, all concentrations</i>
Reason for Request:	Recent advances in data acquisition devices such as 3D cameras and nextGen sequencers have led to an explosion of data sets that can analyzed as data matrices. Current courses in Linear Algebra at Colorado State University are designed to address a wide variety of audiences, are more theoretical and are not streamlined to develop the analysis tools most suited to the study of large data sets. This course is designed for undergraduate majors in data science and will be of interest to other students interesting in analyzing large data sets.		

DSCI 445	DSCI 445 Statistical Machine Learning 3(3-0-0) F	Fall 2018	Required
	<p>Prerequisite: DSCI 320; DSCI 369; STAT 341. Registration Information: Credit allowed for only one of the following: CS 445, CS 480A3, or DSCI 445. Description: Algorithms and statistical methods for regression, classification, and clustering; hands-on experience in analyzing data and running machine learning experiments. Grade Mode: Traditional. [proposed AUCC 4B: Building Upon Foundations and Perspectives in the following: Major in Data Science, Computer Science Concentration Major in Data Science, Economics Concentration Major in Data Science, Mathematics Concentration Major in Data Science, Statistics Concentration]</p>		<i>Data Science major, all concentrations</i>
Reason for Request:	This course will provide core content to the Data Science program and will be a required course for all concentrations.		
DSCI 473	DSCI 473 Introduction to Geometric Data Analysis 2(2-0-0) F	Spring 2018	Elective
	<p>Permanent Partial Semester: Yes. Prerequisite: DSCI 369. Registration Information: This is a partial semester course. Description: Geometric techniques for analyzing high-dimensional and complex data. Techniques for data reduction and analysis. Grade Mode: Traditional.</p>		<i>Data Science major, all concentrations</i>
Reason for Request:	This course will provide core content to the Data Science program and will be required of all majors.		
DSCI 475	DSCI 475 Topological Data Analysis 2(2-0-0) S	Spring 2018	Elective
	<p>Permanent Partial Semester: Yes. Prerequisite: DSCI 473. Registration Information: This is a partial semester course. Description: Topological techniques for analyzing high-dimensional or complex data. Topics include clustering, dendrograms, a visual introduction to topology, data modeling and visualization, and selected topics from nonlinear dimensionality reduction, graph-based models of data, Reeb graphs, multi-scale approaches to data, and persistent homology. Grade Mode: Traditional.</p>		<i>Data Science major, all concentrations</i>
Reason for Request:	This course will provide core content to the Data Science program and will be a possible elective for all concentrations.		
DSCI 478	DSCI 478 Capstone Group Project in Data Science 4(0-0-8) S	Spring 2019	Required
	<p>Prerequisite: DSCI 320; DSCI 369 or MATH 369; DSCI 445. Registration Information: Senior standing only. Description: Group-project-based capstone, in which small groups of students from each Data Science degree concentration work collectively on a problem in data science Grade Mode: Traditional. [proposed AUCC 4A: Using Competencies, AUCC 4B Building Upon Foundations and Perspectives and AUCC 4C: Capstone Experience in the following: Major in Data Science, Computer Science Concentration Major in Data Science, Economics Concentration Major in Data Science, Mathematics Concentration Major in Data Science, Statistics Concentration]</p>		<i>Data Science major, all concentrations</i>
Reason for Request:	This course is the capstone experience for all concentrations in the Data Science program.		

<i>Major Changes to Courses</i>		<i>Effective Term</i>	<i>Notations</i>
COLLEGE OF HEALTH AND HUMAN SCIENCES			
SOWK 640	<p>SOWK 640 Contemporary Issues in Military Culture 3(0-0-3) S, SS</p> <p>Permanent Partial Semester: No Yes</p> <p>Prerequisite: None.</p> <p>Registration Information: Offered as an online course only.</p> <p>Description: Exploration of multiple issues informing social work practice with military and veteran populations including ethical decision making in military social work, resources for veterans, challenges faced by women in the military, secondary trauma, and problems veterans face, such as homelessness, addiction, reintegration, mental illness, suicide. Military culture, the different branches of the military, and generational differences among military personnel will be examined.</p> <p>Grade Mode: Traditional.</p>	Spring 2018	<p>Required</p> <p>Grad Cert Military & Veteran Culture</p>
Reason for Request:	<p>This course is one of three courses in the approved Graduate Certificate in Military and Veteran Culture that will be offered online to MSW students, social work professionals, and professionals from other disciplines practicing in behavioral health with military families. This request is being made to accommodate the schedule of the assigned instructor and time required for course development with TILT. The terms offered for the other two courses are also being revised to follow in sequence, which will allow time for recruitment and course development without further delaying the launch of this certificate program. Additionally, the course is being revised from "partial semester" to "full semester" to support equitable academic load for enrolled students across their courses each term.</p>		
SOWK 641	<p>SOWK 641 Military Family Systems 3(0-0-3) F SS</p> <p>Permanent Partial Semester: No Yes</p> <p>Prerequisite: None.</p> <p>Restriction: Must be a: Graduate, Professional.</p> <p>Registration Information: Offered as an online course only.</p> <p>Description: Exploration of effectively engaging with military families. Strategies to assess and intervene with military and veteran couples, children, and families will be examined. Exploration of topics of integration and reintegration; grief, loss, and bereavement; family-centered programs; support of guard/reserve families; deployment; support of veteran caregivers; and effective interventions through a systems framework.</p> <p>Grade Mode: Traditional.</p>	Spring 2018	<p>Required</p> <p>Grad Cert Military & Veteran Culture</p>
Reason for Request:	<p>This course is one of three courses in the approved Graduate Certificate in Military and Veteran Culture and is offered online to MSW students, social work professionals, and professionals from other disciplines practicing in behavioral health with military families. Due to the delay in development and offering of SOWK 640 to the summer term, this course (SOWK 641) will be offered in fall term, and SOWK 642 will be offered in spring term. Additionally, the course is being revised from "partial semester" to "full semester" to support equitable academic load for enrolled students across their courses each term.</p>		
WARNER COLLEGE OF NATURAL RESOURCES			
GEOL 110	<p>GEOL 110 Introduction to Geology – Parks and Monuments 3(3-0-0) F, S, SS</p> <p>Prerequisite: None.</p> <p>Registration Information: Credit allowed for only one of the following GEOL 110, GEOL 120, GEOL 122, GEOL 124, GEOL 150. Offered only as an online course only.</p> <p>Description: Understanding the physical processes, natural hazards, earth materials, and natural resources of planet Earth, and the relationship of humans to this planet. Outstanding examples of natural features from national and local parks and monuments, using narrated high-resolution (including aerial) video.</p> <p>Grade Mode: Traditional.</p> <p>[proposed new AUCC 3A: Biological/Physical Sciences]</p>	Spring 2018	<p>General Elective</p>

Reason for Request: We are requesting that Geol 110 be approved for AUCC3A, because it perfectly fits in with the goals of that category (specifically, the Physical Sciences). The course is similar especially to Geol 120, already within 3A. This course will for the first time enable CSU students to receive credit through on-line/distance education for a physical geology course that satisfies the AUCC. GEOL 110 is acceptable to the Department of Geosciences as the introductory physical geology course enabling them to begin the Geology major, though they would still have to take our 1 credit lab course, Geol 121.



New Degree – Initial Review only

**Warner College of Natural Resources
Department of Ecosystem Science & Sustainability
Ph.D. in Watershed Science**

Effective Spring 2018
[Link to CIM](#)

Reason for Request: The Department of Ecosystem Science and Sustainability (ESS) houses both a BS and an MS degree in Watershed Science, and we propose adding a Doctor of Philosophy (PhD) degree in Watershed Science. This addition will bring all three Watershed Science degree programs together in one department and build strength in interdisciplinary Watershed Science.

Code	Title	Credits
Master Degree Credit		30
Required Foundation Courses		
<u>GRAD 544</u>	Ethical Conduct of Research	1
<u>WR 692</u>	Seminar	1
Discussion Courses		
Select at least 3 credits from the following:		3
<u>WR 574</u>	Advanced Snow Hydrology	
<u>WR 616</u>	Hillslope Hydrology and Runoff Processes	
Quantitative Courses		
Select at least 3 credits from the following:		3
<u>NR 512</u>	Spatial Statistical Modeling-Natural Resources	
<u>NR 523/STAT 523</u>	Quantitative Spatial Analysis	
<u>STAT 511A</u>	Design and Data Analysis for Researchers I: R Software	
<u>STAT 511B</u>	Design and Data Analysis for Researchers I: SAS Software	
<u>STAT 512</u>	Design and Data Analysis for Researchers II	
<u>WR 674</u>	Data Issues in Hydrology	
Skill Courses		
Select at least 3 credits from the following:		3
<u>GEOL 551</u>	Groundwater Modeling	
<u>NR 503/GR 503</u>	Remote Sensing and Image Analysis	
<u>NR 505</u>	Concepts in GIS	
<u>WR 417</u>	Watershed Measurements	
<u>WR 419</u>	Water Quality Laboratory for Wildland Managers	

Code	Title	Credits
<u>WR 524/CIVE 524</u>	Modeling Watershed Hydrology	
<u>WR 575</u>	Snow Hydrology Field Methods	
Depth and Breadth Courses		
Select at least 6 credits from the following:		6
<u>AREC 542</u>	Applied Advanced Water Resource Economics	
<u>CIVE 413</u>	Environmental River Mechanics	
<u>CIVE 520</u>	Physical Hydrology	
<u>CIVE 544</u>	Water Resources Planning and Management	
<u>CIVE 613</u>	River Restoration Design	
<u>CIVE 622</u>	Risk Analysis of Water/Environmental Systems	
<u>CIVE 625</u>	Quantitative Eco-Hydrology	
<u>CIVE 626</u>	Integrated Analysis of Coupled Water Issues	
<u>ESS 501</u>	Principles of Ecosystem Sustainability	
<u>ESS 543/ATS 543</u>	Current Topics in Climate Change	
<u>ESS 660</u>	Biogeochemical Cycling in Ecosystems	
<u>GEOL 452</u>	Hydrogeology	
<u>GEOL 552</u>	Advanced Topics in Hydrogeology	
<u>GEOL 652</u>	Fluvial Geomorphology	
<u>NR 510</u>	Ecosystem Services: Theory and Practice	
<u>NR 577</u>	Wetland Ecology and Restoration	
<u>SOC 461</u>	Water, Society, and Environment	
<u>SOC 664</u>	Sociology of Water Resources	
<u>SOCR 522</u>	Micrometeorology	
<u>SOCR 540</u>	Soil-Plant-Nutrient Relationships	
<u>SOCR 670</u>	Terrestrial Ecosystems Isotope Ecology	
<u>WR 416</u>	Land Use Hydrology	
<u>WR 418</u>	Land Use and Water Quality	
<u>WR 510</u>	Watershed Management in Developing Countries	
<u>WR 511</u>	Water Resource Development	
<u>WR 512</u>	Water Law for Non-Lawyers	
Research and Dissertation		
<u>WR 798</u>	Research	2
<u>WR 799</u>	Dissertation	2
Electives		21
Program Total Credits:		72

A minimum of 72 credits are required to complete this program.



New Graduate Certificate

College of Agricultural Sciences
Department of Agricultural and Resource Economics
Graduate Certificate in Teaching in Extension

Effective Spring 2018
[Link to CIM](#)

Reason for Request: There are no certificates designed for working Extension personnel. The work of Extension personnel closely resembles that of educators; however, unlike educators, Extension personnel have limited opportunities to continue their formal training. The Graduate Certificate in Teaching in Extension will provide Extension personnel an opportunity to learn new instructional techniques and issues related to their field. This certificate has been developed with the guidance from leaders within Colorado Extension.

Effective Spring 2018

Additional coursework may be required due to prerequisites.

Code	Title	Credits
AGED 525	Agricultural and Extension Teaching	3
AGRI 546	Principles of Cooperative Extension	3
AGRI 547	Delivery of Cooperative Extension Programs	4
<u>Select one course from the following:</u>		<u>3</u>
AGED 600	Evaluation and Applied Research in Extension	
EDAE 5XX-7XX		
HDFS 5XX-7XX		

Program Total Credits: **13**

*This certificate may have courses in common with other graduate certificates. A student may earn more than one certificate, but a given course may be counted only in one certificate.



New Minor

College of Agricultural Sciences
Department of Agricultural and Resource Economics
Minor in Food Industry Management

Effective Fall 2017
[Link to CIM](#)

Reason for Request: Modern food systems are characterized by a series of interactions of economic agents and institutions, including farms, agribusiness intermediaries, food processing, distribution and service industries, consumers and regulatory agencies (at the local, state, federal level). Combining a core of AREC courses providing content addressing business management issues projected outside the farm gate with electives in food technology and service management courses, students whose main focus is Animal Science, Equine Science, Food Technology, Restaurants and Resort Management, can pursue this minor and acquire a unique blend of competencies that will make them more marketable to employers. We expect this to be a popular minor, fitting many in the College of Agricultural Science and Health and Human Sciences.

Students must satisfactorily complete the total credits required for the minor. Minors and interdisciplinary minors require 12 or more upper-division (300- to 400-level) credits.

Additional coursework may be required due to prerequisites.

Code	Title	Credits
Required Courses		
<u>AREC 202</u>	Agricultural and Resource Economics (GT-SS1)	3
<u>AREC 311</u>	Agricultural and Resource Product Marketing	3
AREC Electives		
Select at least two courses from the following:		6
<u>AREC 305</u> [3]	Agricultural and Resource Enterprise Analysis	
<u>AREC 325</u> [3]	Personnel Management in Agriculture	
<u>AREC 375</u> [3]	Agricultural Law	
<u>AREC 328</u> [3] or <u>AREC 428</u> [3]	Small Agribusiness Management Agricultural Business Management	
<u>AREC 478</u> [3]	Agricultural Policy	
Food Industry Electives		
Select a minimum of 9 credits from the following:		9
<u>FTEC 110</u> [3]	Food-From Farm to Table	
<u>FTEC 400</u> [3]	Food Safety	
<u>HORT 100</u> [4]	Horticultural Science	
<u>MGT 301</u> [3]	Supply Chain Management	
<u>RRM 310</u> [3]	Food Service Systems-Operations	
<u>RRM 311</u> [3]	Food Service Systems-Production and Purchasing	
<u>RRM 330</u> [2]	Alcohol Beverage Control and Management	
<u>RRM 345</u> [3]	Food, Beverage, and Labor Cost Control	
<u>RRM 460/NRRT 460</u> [3]	Event and Conference Planning	
Program Total Credits:		21



Major Changes to Existing Programs

College of Agricultural Sciences
 Master of ~~Agricultural~~ Extension Education, Plan C (M.~~A.~~E.E.)

Effective Fall 2017
[Link to CIM](#)

Reason for Request: The Master of Extension Education is being rebooted after an overhaul of the program. Furthermore, the academic home of the program has been changed to the Department of Agriculture and Resource Economics in the College of Agricultural Sciences. The changes in the program, including new courses, reflect input from Extension specialists and leaders in Colorado.

Effective Fall ~~2017~~ 2011

Code	Title	Credits
Required Courses		
AGRI 500	Advanced Issues in Agriculture	3
<u>AGED 510</u>	<u>American Agricultural Values and Ideology</u>	<u>3</u>
<u>AGED 525</u>	<u>Agricultural and Extension Teaching</u>	<u>3</u>
<u>AGED 587</u>	<u>Internship in Extension</u>	<u>2</u>
<u>AGED 600</u>	<u>Evaluation and Applied Research in Extension</u>	<u>3</u>
<u>AGRI 546</u>	Principles of Cooperative Extension	3
<u>AGRI 547</u>	Delivery of Cooperative Extension Programs	4
AGRI 587A or AGRI 587B	Internship- Domestic-¹ Internship- International	1-6
Education Course Electives		
Select a minimum of 6 credits of EDAE, EDOD, or EDUC courses at the 500-level or above with approval of the student's graduate advisor.		6
Graduate Electives-²		13-14
Undergraduate Electives-³		0-6
<u>Select a minimum of 9 credits from AGED, AGRI, EDAE, HDFS, JTC, and SOWK courses at the 500-level or above with approval of the student's graduate advisor. ¹</u>		<u>9</u>
<u>Select a minimum of 9 credits disciplinary course work at the 500-level or above with approval of the student's graduate advisor. ¹</u>		<u>9</u>
Program Total Credits:		36

A minimum of 36 credits are required to complete this program. Of the 36 minimum credits required for this program, at least 24 credits must be earned at CSU. No independent study, research, supervised college teaching, or practicum credits may apply toward the degree.

¹ ~~A maximum of 6 credits may apply toward the degree.~~

² A minimum of 21 credits must be earned at the 500-level or above in the student's area of study approved by the student's graduate advisor.

³ ~~A maximum of 6 credits at the 400-level with approval by the student's graduate advisor taken after completion of the bachelor's degree may apply toward the degree.~~



College of Business
Department of Accounting
Master of Accountancy, Plan C, Taxation Specialization

Effective Fall 2018
[Link to CIM](#)

Reason for Request: Revisions reflect changes in MAcc core and electives, which align curriculum with changes in professional practice environment, and state licensure requirements.

Effective Fall 2018 ~~2017~~

Code	Title	Credits
Required Core		
ACT 540	Professional Ethics and Responsibilities	3
ACT 561	Legal and Regulatory Issues in Accounting	3
ACT 601A	Professional Practice: Taxation	3
ACT 631	Corporate Taxation	3
ACT 641	Contemporary Auditing	3
Required Courses		
ACT 633	Flow-Through Entities	3
ACT 635	State and Local Taxation	3
ACT 636	Taxation of Corporations and Shareholders	3
ACT 639	Special Topics in Taxation	3
Elective Courses		3
Select 3 credits from the following:		
ACT 541	Forensic Accounting and Fraud Auditing	
ACT 550	Accounting Information Technologies	
ACT 570	Government and Nonprofit	
ACT 575	Oil and Gas Accounting	
ACT 612	Issues in Financial Reporting and Auditing	
ACT 614	Financial Statement Analysis and Valuation	
CIS 570	Business Intelligence	
CIS 575	Applied Data Mining and Analytics in Business	
CIS 600	Information Technology and Project Management	
CIS 601	Enterprise Computing and Systems Integration	
FIN 475	International Business Finance	
MGT 468	Negotiating Globally	
MGT 476	Negotiation and Conflict Management	

Program Total Credits:

30

A minimum of 30 credits are required to complete this program.



**College of Engineering
 Interdisciplinary Minor in Biomedical Engineering**

Effective Fall 2017
[Link to CIM](#)

Reason for Request: The BME minor has not been updated in quite a few years. Now that there is a biomedical engineering bachelor's program there are more biomedical engineering courses available. This request realigns the engineering and non-engineering content of the BME minor to strengthen the engineering requirements and to provide better balance of the courses necessary for the interdisciplinary minor.

Effective ~~Spring 2013~~ Fall 2017

Students must satisfactorily complete the total credits required for the minor. Minors and interdisciplinary minors require 12 or more upper-division (300- to 400-level) credits.

Additional coursework may be required due to prerequisites.

~~The undergraduate program requires completion of a minimum of 21 credits with at least 12 credits greater than or equal to 300-level courses. All students are required to complete the 7 credits of Core Courses. The 14 credits of Selection Courses are chosen according to the student's major (engineering or non-engineering). Engineering students must take at least 14 credits from group II, and non-engineering students must take from 9-11 credits from group I and from 3-5 credits from group II, for a total of 14 credits.~~

Code	Title	Credits
Core Courses		
<u>BIOM 101</u> or BIOM 470	Introduction to Biomedical Engineering Biomedical Engineering	3
<u>Choose one course from the following:</u>		<u>4-5</u>
<u>BMS 300</u>	Principles of Human Physiology (<i>Changed from required course to elective option</i>)	
<u>BMS 301</u>	<u>Human Gross Anatomy</u> (<i>Moved from Course List II to elective option in core</i>)	
<u>BMS 360</u>	<u>Fundamentals of Physiology</u> (<i>Moved from Course List II to elective option in core</i>)	
Selection Courses (minimum of 14 credits)		
I. Engineering Courses for Non-Engineering Students:		
In order to fulfill the 21-credit program minimum, non-engineering students must select at least 9-11 credits from the following engineering-related courses:		9-11
II. Science, Engineering, Animal Research, Bioethics, and Entrepreneurship Courses:		
In order to fulfill the 21-credit program minimum, engineering students must select at least 14 credits from the following. Non-engineering students must select at least 3-5 credits.		3-14
<u>Electives – Select the appropriate option below based on your major:</u>		<u>13-14</u>
<u>Non-Engineering Majors</u> <u>For courses that are included on both Course Lists below, credit may not be double-counted toward both requirements.</u>		
<u>Engineering and Related Courses for Non-Engineering Majors Course List – Select a minimum of 9 credits</u>		
<u>Science, Engineering, Animal Research, Bioethics, and Entrepreneurship Course List – Select a minimum of 3 credits</u>		
<u>Engineering Majors</u>		
<u>Science, Engineering, Animal Research, Bioethics, and Entrepreneurship Course List – Select a minimum of 13 credits</u>		

Program Total Credits:

21

Engineering and Related Courses for Non-Engineering Majors Course List (Non-Engineering majors must select a minimum of 9 credits from this list)

Code	Title	Credits
<u>BIOM 300</u>	Problem-Based Learning Biomedical Engr Lab	4
BIOM 330	Course BIOM 330 Not Found	
BIOM 400	Course BIOM 400 Not Found	
<u>BIOM 421</u>	<u>Transport Phenomena in Biomedical Engineering</u>	<u>3</u>
<u>BIOM 422</u>	<u>Kinetics of Biomolecular and Cellular Systems</u>	<u>3</u>
<u>BIOM 431/ECE 431</u>	<u>Biomedical Signal and Image Processing</u>	<u>3</u>
<u>BIOM 441</u>	Biomechanics and Biomaterials	3
<u>BIOM 525/MECH 525</u>	<u>Cell and Tissue Engineering</u>	<u>3</u>
<u>BIOM 533/CIVE 533</u>	<u>Biomolecular Tools for Engineers</u>	<u>3</u>
<u>BIOM 573/MECH 573</u>	<u>Structure and Function of Biomaterials</u>	<u>3</u>
<u>BIOM 574/MECH 574</u>	<u>Bio-Inspired Surfaces</u>	<u>3</u>
<u>CBE 201</u>	Material and Energy Balances	3
<u>CBE 210</u>	Thermodynamic Process Analysis	3
<u>CBE 320</u>	Chemical and Biological Reactor Design	3
<u>CBE 331</u>	Momentum Transfer and Mechanical Separations	3
<u>CBE 332</u>	Heat and Mass Transfer Fundamentals	3
<u>CBE 406</u>	Introduction to Transport Phenomena	3
<u>CBE 430</u>	Process Control and Instrumentation	3
<u>CIVE 260</u>	Engineering Mechanics-Statics	3
<u>CIVE 261</u>	Engineering Mechanics-Dynamics	3
<u>ECE 202</u>	Circuit Theory Applications	4
<u>ECE 204</u>	Introduction to Electrical Engineering	3
ECE 303/STAT 303	Introduction to Communications Principles	3
or STAT 315	Statistics for Engineers and Scientists	
<u>ECE 331</u>	Electronics Principles I	4
<u>ECE 341</u>	Electromagnetic Fields and Devices I	3
<u>MECH 237</u>	Introduction to Thermal Sciences	3
<u>MECH 307</u>	Mechatronics and Measurement Systems	4
<u>MECH 331</u>	Introduction to Engineering Materials	4
<u>MECH 342</u>	Mechanics and Thermodynamics of Flow Processes	3
<p><u>A maximum of 3 credits may be selected from the following non-engineering and independent study or practicum courses:</u></p>		
<u>BIOM 476A</u> or <u>BIOM 476B</u>	Biomedical Clinical Practicum I Biomedical Clinical Practicum II	
<u>BIOM 495</u>	<u>Independent Study</u>	

Code	Title	Credits
ECE 303/STAT 303	Introduction to Communications Principles	
MATH 340	Introduction to Ordinary Differential Equations	
PH 245	Introduction to Electronics	
STAT 315	Statistics for Engineers and Scientists	

Science, Engineering, Animal Research, Bioethics, and Entrepreneurship Course List (Engineering majors must select a minimum of 13 credits from this list; Non-Engineering majors must select a minimum of 3 credits from this list)

Code	Title	Credits
BC 351	Principles of Biochemistry	4
BIOM 300	Problem-Based Learning Biomedical Engr Lab	4
BIOM 330	Course BIOM 330 Not Found	
BIOM 400	Course BIOM 400 Not Found	
BIOM 421	Transport Phenomena in Biomedical Engineering	3
BIOM 422	Kinetics of Biomolecular and Cellular Systems	3
BIOM 431/ECE 431	Biomedical Signal and Image Processing	3
BIOM 441	Biomechanics and Biomaterials	3
BIOM 476A or BIOM 476B	Biomedical Clinical Practicum I Biomedical Clinical Practicum II	2
BIOM 495	Independent Study	1-6
BIOM 525/MECH 525	Cell and Tissue Engineering	3
BIOM 533/CIVE 533	Biomolecular Tools for Engineers	3
BIOM 573/MECH 573	Structure and Function of Biomaterials	3
BIOM 574/MECH 574	Bio-Inspired Surfaces	3
BMS 301	Human Gross Anatomy	5
BMS 325	Cellular Neurobiology	3
BMS 345	Functional Neuroanatomy	4
BMS 360	Fundamentals of Physiology	4
BMS 405	Nerve and Muscle-Toxins, Trauma and Disease	3
BMS 420	Cardiopulmonary Physiology	3
BMS 430	Endocrinology	3
BZ 310	Cell Biology	4
CHEM 113	General Chemistry II	3
CHEM 245	Fundamentals of Organic Chemistry	4
CHEM 341 or CHEM 345	Modern Organic Chemistry I Organic Chemistry I	3
CHEM 344	Modern Organic Chemistry Laboratory	2

Code	Title	Credits
<u>HES 207</u>	Anatomical Kinesiology	3
<u>HES 307</u>	Biomechanical Principles of Human Movement	4
<u>HES 403</u>	Physiology of Exercise	4
<u>HES 405</u>	Exercise Testing Instrumentation	2
<u>HES 420</u>	Electrocardiography and Exercise Management	3
<u>HES 476</u>	Exercise and Chronic Disease	3
<u>LIFE 102</u>	Attributes of Living Systems (GT-SC1)	4
<u>LIFE 103</u>	Biology of Organisms-Animals and Plants	4
<u>LIFE 210</u>	Introductory Eukaryotic Cell Biology	3
<u>MIP 300</u>	General Microbiology	3
<u>OT 215</u>	Medical Terminology	1
<u>PSY 456</u>	Sensation and Perception	3
<u>PSY 457</u>	Sensation and Perception Laboratory	2
<u>A maximum of one course, 3 credits, may be selected from the following non-technical courses:</u>		
<u>BUS 205</u>	Legal and Ethical Issues in Business	
<u>MGT 420</u>	New Venture Creation	
<u>MGT 440</u>	New Venture Management	
<u>PHIL 205</u>	Introduction to Ethics	
<u>PHIL 305E</u>	Philosophical Issues in the Professions: Animal Science	

~~± Only 3 credits of non-technical courses may count toward requirements.~~



College of Liberal Arts
 Department of Communication Studies
 Master of Arts in Communication Studies, Plan A

Effective Fall 2017
[Link to CIM](#)

- Reason for Request:**
- 1) Adding 639 to the core class list so that each area of emphasis in our department has a corresponding theory survey course.
 - 2) Reducing the number of elective credits from 15 to 12 to accommodate the change to the core.
 - 3) Correcting errors in the previous program of study:
 - a) 692 was listed for 6 credits. It should only be 3;
 - b) 699 was listed for 3 credits. It should be 6 (692 and 699 got mistakenly swapped in the previous program listing note);
 - c) The total program credits required changed from 45 to 36-42 for two reasons:
 - i) In the current catalog version, 675 and 684 were built into the regular program requirements, but they are only taken by students with GTA positions;
 - ii) The current catalog version lists ranges of elective credits, and the high end of the range is incorrect. There is one course (3 credits) too many on the elective range.

Effective Fall 2017 ~~2008~~

First Year		
Fall		Total Credits
<u>SPCM 601</u>	History of Rhetorical Theory	3
<u>SPCM 646</u>	Media Theory	3
<u>SPCM 675</u> ¹	Speech Communication Pedagogy	3
<u>SPCM 692</u>	Seminar	3
Elective		3
-	Total Credits	0
Spring		
<u>SPCM 612</u>	Rhetorical Criticism	3
<u>SPCM 638</u>	Communication Research Methods	3
<u>SPCM 684</u> ¹	Supervised College Teaching	3
Electives		3-6
-	Total Credits	0
Second Year		
Fall		
<u>SPCM 692</u>	Seminar	3
Elective		3-6
-	Total Credits	0
Spring		
<u>SPCM 699</u>	Thesis	3
Elective		0-3
-	Total Credits	0
-	Program Total Credits:	0
Plan of Study Grid		
Code	Title	Credits
Core:		
<u>SPCM 601</u>	<u>History of Rhetorical Theory</u>	<u>3</u>
<u>SPCM 612</u>	<u>Rhetorical Criticism</u>	<u>3</u>
<u>SPCM 638</u>	<u>Communication Research Methods</u>	<u>3</u>
<u>SPCM 639</u>	<u>Communication Theory</u>	<u>3</u>
<u>SPCM 646</u>	<u>Media Theory</u>	<u>3</u>
<u>SPCM 692</u>	<u>Seminar</u>	<u>3</u>
<u>SPCM 699</u>	<u>Thesis</u>	<u>6</u>
<u>Electives</u>		<u>12</u>

Code	Title	Credits
<u>Students must take 12 SPCM graduate credits, with no more than 3 of those credits taken outside the department</u>		
<u>Students on graduate teaching assistantships also must take the following courses:</u>		<u>6</u>
<u>SPCM 675</u>	<u>Speech Communication Pedagogy</u>	
<u>SPCM 684</u>	<u>Supervised College Teaching</u>	

Program Total Credits: 36-4245

A minimum of 36 ~~45~~ credits are required to complete this program.

~~+~~ ~~Students who are not serving as teaching assistants are not required to take SPCM 675 or SPCM 684. Graduate students are expected to complete a minimum of 27 credits in coursework other than SPCM 684, SPCM 692, or SPCM 699. Only one course from outside the department may count toward that 27 credits. Only one course at the 300 or 400 level may count toward that 27 credits.~~



College of Natural Sciences
 Department of Mathematics
 Major in Mathematics, Actuarial Science Concentration

Effective Spring 2018
[Link to CIM](#)

Effective Spring 2018 ~~Summer 2017~~

A minimum grade of C is required in all mathematics, statistics, and computer science courses which are required for graduation.

FRESHMAN		
	AUCC	CREDITS
<u>CO 150</u>	College Composition (GT-CO2)	1A 3
<u>ECON 202</u>	Principles of Microeconomics (GT-SS1)	3C 3
<u>ECON 204</u>	Principles of Macroeconomics (GT-SS1)	3C 3
<u>MATH 160</u>	Calculus for Physical Scientists I (GT-MA1)	1B 4
<u>MATH 161</u>	Calculus for Physical Scientists II (GT-MA1)	1B 4
<u>MATH 192</u>	First Year Seminar in Mathematical Sciences	1
<u>Arts and Humanities</u>		3B 3
<u>Biological and Physical Sciences</u> ¹		3A 5
<u>Global and Cultural Awareness</u>		3E 3
Elective		1
Total Credits		29-30
SOPHOMORE		
<u>ACT 210</u> ²	Introduction to Financial Accounting	3
<u>FIN 310</u>	Financial Markets and Institutions	3
<u>MATH 235</u>	<u>Introduction to Mathematical Reasoning</u>	- <u>2</u>
<u>MATH 261</u>	Calculus for Physical Scientists III	4
<u>MATH 369</u>	Linear Algebra I	4A 3

STAT 315	Statistics for Engineers and Scientists		3
Arts and Humanities		3B	3
Select one group from the following:			
Group A: CS 163 or 164	Java (CS1) No Prior Programming Java (CS1) Prior Programming		4
Group B: CS 155 CS 156	Introduction to Unix Introduction to C Programming I		
In addition, to complete Group B, select at least two of the following:			
CS 157	Introduction to C Programming II		
CS 158/MATH 158	Mathematical Algorithms in C		
MATH 151	Mathematical Algorithms in Matlab I		
MATH 152	Mathematical Algorithms in Maple		
Biological and Physical Sciences¹		3A	5
Historical Perspectives		3D	3
Total Credits			3029-31
JUNIOR			
FIN 300	Principles of Finance		3
ECON 335/AREC 335	Introduction to Econometrics		3
JTC 300	Professional and Technical Communication (GT-CO3)	2	3
MATH 317	Advanced Calculus of One Variable	4B	3 4
STAT 420	Probability and Mathematical Statistics I		3
STAT 421	Introduction to Stochastic Processes		3
STAT 430	Probability and Mathematical Statistics II		3
Select one from the following:			
MATH 340	<u>Introduction to Ordinary Differential Equations</u>	-	-
MATH 345	Differential Equations		
Arts and Humanities		3B	3
Elective			2 6
Total Credits			3029
SENIOR			
BUS 205	Legal and Ethical Issues in Business		3
FIN 342	Risk Management and Insurance		3
FIN 370	Financial Management-Theory and Application		3
JTC 300	Professional and Technical Communication (GT-CO3)	2	3
MATH 417	Advanced Calculus I	4C	3
MATH 495³	Independent Study		1

<u>Biological and Physical Sciences¹</u>	3A	0-3
Electives ⁴		1-17
Total Credits		30

Program Total Credits: 120

- ¹ Students in this concentration must take a total of 10 credits in category 3A, and at least one course must have a laboratory component.
- ² Students in this concentration may need to obtain a prerequisite override from the appropriate department to enroll in this class.
- ³ Preparation for Exam I.
- ⁴ Select enough elective credits to bring program total to a minimum of 120 credits, of which at least 42 must be upper-division (300- to 400-level).



College of Natural Sciences
 Department of Mathematics
 Major in Mathematics, Applied Mathematics Concentration

Effective Spring 2018
[Link to CIM](#)

Effective Spring ~~2017~~ 2018

A minimum grade of C is required in all mathematics, statistics, and computer science courses which are required for graduation.

FRESHMAN			
		AUCC	CREDITS
<u>CO 150</u>	College Composition (GT-CO2)	1A	3
<u>MATH 160</u>	Calculus for Physical Scientists I (GT-MA1)	1B	4
<u>MATH 161</u>	Calculus for Physical Scientists II (GT-MA1)	1B	4
<u>MATH 192</u>	First Year Seminar in Mathematical Sciences		1
<u>Arts and Humanities</u>		3B	6
<u>Global and Cultural Awareness</u>		3E	3
<u>Historical Perspectives</u>		3D	3
<u>Social and Behavioral Sciences</u>		3C	3
Electives			3
Total Credits			30
SOPHOMORE			
<u>MATH 235</u>	<u>Introduction to Mathematical Reasoning</u>	-	<u>2</u>
<u>MATH 261</u>	Calculus for Physical Scientists III		4
<u>MATH 301</u>	Introduction to Combinatorial Theory		3
<u>MATH 369</u>	Linear Algebra I	4A	3
<u>PH 141</u>	Physics for Scientists and Engineers I (GT-SC1)	3A	5
<u>PH 142</u>	Physics for Scientists and Engineers II (GT-SC1)	3A	5
<u>STAT 315</u>	Statistics for Engineers and Scientists		3

<u>Select one course from the following:</u>		-	3
<u>STAT 341</u>	Statistical Data Analysis I	-	-
<u>STAT 400</u>	Statistical Computing	-	-
<u>STAT 420</u>	Probability and Mathematical Statistics I	-	-
Select one group from the following:			4
Group A:			
<u>CS 163</u> or <u>164</u>	Java (CS1) No Prior Programming Java (CS1) Prior Programming		
Group B:			
<u>CS 155</u>	Introduction to Unix		
<u>CS 156</u>	Introduction to C Programming I		
In addition, to complete Group B, select at least two of the following:			
<u>CS 157</u>	Introduction to C Programming II		
<u>CS 158/MATH 158</u>	Mathematical Algorithms in C		
<u>MATH 151</u>	Mathematical Algorithms in Matlab I		
<u>MATH 152</u>	Mathematical Algorithms in Maple		
<u>Elective</u>		-	1
Total Credits			30
JUNIOR			
<u>JTC 300</u>	Professional and Technical Communication (GT-CO3)	2	3
<u>MATH 317</u>	Advanced Calculus of One Variable	4B	34
<u>MATH 450</u>	Introduction to Numerical Analysis I		3
<u>MATH 451</u>	Introduction to Numerical Analysis II		3
<u>Select one course from the following:</u>		-	4
<u>MATH 340</u>	<u>Introduction to Ordinary Differential Equations</u>	-	-
<u>MATH 345</u>	Differential Equations		
<u>Biological and Physical Sciences</u> ¹		3A	3
Mathematics Sciences ²			3
Related Area ³			6
Electives			3
Total Credits			3132
SENIOR			
<u>MATH 435</u>	Projects in Applied Mathematics	4C	3
Select one group from the following:			6
Group A:			
<u>MATH 332</u>	Partial Differential Equations		
<u>MATH 417</u>	Advanced Calculus I		

Group B:		
<u>MATH 360</u>	Mathematics of Information Security	
<u>MATH 460</u>	Information and Coding Theory	
<u>Select one course from the following:</u>		3
<u>STAT 341</u>	<u>Statistical Data Analysis I</u>	-
<u>STAT 400</u>	<u>Statistical Computing</u>	-
<u>STAT 420</u>	<u>Probability and Mathematical Statistics I</u>	-
Mathematical Sciences ²		3
Related Area ³		6
Electives ⁴		8 10
	Total Credits	2928
Program Total Credits:		120

¹ Select from the list of courses (in a department other than Physics) in category 3A in the AUCC.

² Select from upper-division MATH, CS, STAT courses, except those ending in -80 to -99.

³ A coherent set of courses outside the Mathematics Department in which mathematics is applied, approved by the concentration coordinator.

⁴ Select enough elective credits to bring the program total to a minimum of 120 credits, of which at least 42 must be upper-division (300- to 400-level).



University Curriculum Committee
 April 14, 2017
CONSENT AGENDA

<i>Experimental Courses – 1st Offering</i>			
	Course Title	Effective Term	
<u>GES481A1/</u> <u>MSE 481A1</u>	Sustainable Strategies for E-Waste Management	Fall 2017	
<i>Experimental Courses – 2nd Offering (For Informational Purposes Only)</i>			
	Course Title	Effective Term	
<u>GEOL 680A1</u>	Field Geomorphology	Fall 2017	
<u>MIP 681A2</u>	Mycobacterial Research Library Seminar	Fall 2017	
<i>Course Drops</i>			
	Course Title	Requested Change	Effective Term
<u>AA 150</u>	Observational Astronomy	Drop	Summer 2017