

## A MEMORANDUM

DATE: April 29, 2022  
TO: Academic Deans Council  
FROM: Dr. Andy Perkins  
UCCC Chair  
RE: Change Notice 13

Listed below are curriculum change proposals which have been recommended by the University Committee Courses and Curricula. Under current procedure, members of the Academic Deans Council may question the approval of these proposals at any time prior to 5:00 p.m. on May 12, 2022 by contacting Dr. Andy Perkins (5-0004) or the office of the Vice President for Academic Affairs (5-3742). If no questions have been raised, the proposals will be considered approved automatically.



1. Course Proposals by college/school

**ACADEMIC AFFAIRS**

<p>Addition</p> <p><u>DSCI 2012</u></p>	<p><b>Approved</b></p>	<p><b>DSCI 2012 Data Science Lab – Data Wrangling.</b> (2). Four hours laboratory. Practical application of data science tools to clean, format, and work with data.          Method of Instruction: L          Method of Delivery: F          Campus: 1          CIP: 307001          30 Char: Data Sci Lab – Data Wrangling          Effective: Spring 2022</p>
<p>Addition</p> <p><u>DSCI 2013</u></p> <p>+Gen. Ed.          +Meridian          +Online/Distance          +Study Abroad</p>	<p><b>Approved</b></p>	<p><b>DSCI 2013 Data Science Literacy.</b> (3). Three hours lecture. Introduction to data science as a field that represents the world and society through data objects, extracts new knowledge from these data objects, and creates artificially intelligent systems that perform tasks while producing further insights that improve the performance of institutions, organizations, businesses, and society.          Method of Instruction: C          Method of Delivery: F &amp; O          Campus: 1, 2, 5, &amp; 8          CIP: 110101          30 Char: Data Science Literacy          General Education: Social/Behavior Science          Effective: Spring 2022</p>
<p>Addition</p> <p><u>DSCI 2022</u></p>	<p><b>Approved</b></p>	<p><b>DSCI 2022 Data Science Lab – Cloud, High-Performance, and Quantum Computing.</b> (2). (Prerequisite: DSCI 2012). Four hours laboratory. Hands-on use of cloud GPU/TPU, high-performance, or quantum computing platforms to perform computing tasks for big data analysis tasks.          Method of Instruction: L          Method of Delivery: F          Campus: 1          CIP: 307001          30 Char: Data Sci Lab: Computing          Effective: Spring 2022</p>

Addition	<u>DSCI 3012</u>	Approved	<p><b>DSCI 3012 Data Science Lab – Description, Analysis, and Inference.</b> (2). (Prerequisite: MA/ST 2113 or BQA 2113). Four hours laboratory. Hands-on programming work to use descriptive, inferential, predictive, and prescriptive statistical techniques with a variety of data types.</p> <p>Method of Instruction: L  Method of Delivery: F  Campus: 1  CIP: 307001  30 Char: Data Sci Lab: Desc, Analysis  Effective: Spring 2022</p>
Addition	<u>DSCI 3013</u>	Approved	<p><b>DSCI 3013 Fundamentals of Data Acquisition.</b> (3). Three hours lecture. An introduction to the fundamentals of data and data acquisition for data science.</p> <p>Method of Instruction: C  Method of Delivery: F  Campus: 1  CIP: 307001  30 Char: Fund of Data Acquisition  Effective: Spring 2022</p>
Addition	<u>DSCI 3022</u>	Approved	<p><b>DSCI 3022 Data Science Lab – Data Visualization.</b> (2). (Prerequisite: DSCI 2012). Four hours laboratory. Hands-on use of tools and programming libraries to visualize data using common approaches to the visual display of numerical, conceptual, and geospatial information.</p> <p>Method of Instruction: L  Method of Delivery: F  Campus: 1  CIP: 307001  30 Char: Data Sci Lab – Visualization  Effective: Spring 2022</p>
Addition	<u>DSCI 3032</u>	Approved	<p><b>DSCI 3032 Data Science Lab – Artificial Intelligence.</b> (2). (Prerequisite: DSCI 2012). Four hours laboratory. Hands-on use of artificial intelligence and machine-learning libraries to train models in areas such as natural language processing, computer vision, and classification.</p> <p>Method of Instruction: L  Method of Delivery: F  Campus: 1  CIP: 307001  30 Char: Data Sci Lab – Artif Intell  Effective: Spring 2022</p>

<p>Addition +Online/Distance</p> <p><u>DSCI 4013</u></p>	<p><b>Approved</b></p>	<p><b>DSCI 4013 Data Visualization.</b> (3). Three hours lecture. Course providing theoretical foundation for data visualization. Deals with external representation and interactive manipulation of information, data, or artifacts using digital tools to enhance communication, analytical reasoning, and decision-making. (Same as CSE 4423). Method of Instruction: C Method of Delivery: F &amp; O Campus: 1 &amp; 5 CIP: 307001 30 Char: Data Visualization Effective: Spring 2022</p>
<p>Addition</p> <p><u>DSCI 4553</u></p>	<p><b>Approved</b></p>	<p><b>DSCI 4553 Data Science Capstone 1.</b> (3). (Prerequisite: Senior Standing). The first of two, three-hour capstone courses. An individual, project-based course open only to candidates for the Bachelor of Science in Data Science degree. Formal written and oral project reports are required. Method of Instruction: I Method of Delivery: F Campus: 1 CIP: 307001 30 Char: Data Science Capstone 1 Grade Mode: Pass/Fail Effective: Spring 2022</p>
<p>Addition</p> <p><u>DSCI 4663</u></p>	<p><b>Approved</b></p>	<p><b>DSCI 4663 Data Science Capstone 2.</b> (3). (Prerequisites: Senior Standing, DSCI 4553). The second of two, three-hour capstone courses. An individual, project-based course open only to candidates for the Bachelor of Science in Data Science degree. Formal written and oral project reports are required. Method of Instruction: E Method of Delivery: F Campus: 1 CIP: 307001 30 Char: Data Science Capstone 2 Grade Mode: Pass/Fail Effective: Spring 2022</p>



<p>Addition +Online/Distance</p> <p><u>DSCI 8013</u></p>	<p>Approved</p>	<p><b>DSCI 8013 Data Science Literacy Pedagogy 1: Governance, Ethics, and Data Science Applications.</b> (3). Three hours lecture. General subject-matter introduction to the field of data science and data science instruction with a focus on governance, ethics, and data science applications in many fields. Method of Instruction: C Method of Delivery: O Campus: 5 CIP: 307001 30 Char: Data Science Pedagogy 1 Effective: Spring 2022</p>
<p>Addition +Online/Distance</p> <p><u>DSCI 8023</u></p>	<p>Approved</p>	<p><b>DSCI 8023 Data Science Literacy Pedagogy 2: Technical Overview of Data Science Methods and Strategies.</b> (3). Three hours lecture. General subject-matter introduction to the field of data science and data science instruction with a focus on data science methods and strategies. Method of Instruction: C Method of Delivery: O Campus: 5 CIP: 307001 30 Char: Data Science Pedagogy 2 Effective: Spring 2022</p>
<p>Addition +Online/Distance</p> <p><u>DSCI 8033</u></p>	<p>Approved</p>	<p><b>DSCI 8033 Data Science Classroom Integration.</b> (3). Three hours lecture. Applying and integrating principles of data science into the context of the classroom. Topics include importance of data science across the domain; digital citizenship; career exploration; and an historical perspective on analyzing, posing, and solving problems using data. Method of Instruction: C Method of Delivery: O Campus: 5 CIP: 307001 30 Char: Data Sci Classroom Integration Effective: Spring 2022</p>

## AGRICULTURE AND LIFE SCIENCES

<p>Addition <u>EPP 6273</u> +Online/Distance (split level with 4273)</p>	<p><b>Approved</b></p>	<p><b>EPP 4273/6273 Honey Bee Biology and Beekeeping.</b> (3). Three hours lecture. Fall Semester. In this introduction to the fascinating honey bee and its biology, students will learn the biology of the honey bee, the social structure and behaviors of a colony, the basics of beekeeping, pollination, and about products of the hive. Method of Instruction: C Method of Delivery: F &amp; O Campus: 1 &amp; 5 CIP: 260702 30 Char: Honey Bee Biology and Beekeeping Effective: Spring 2022</p>
<p>Addition <u>EPP 6863</u> +Online/Distance (split level with 4863)</p>	<p><b>Approved</b></p>	<p><b>EPP 4863/6863 Insects and Global Change.</b> (3). (Prerequisite: introductory course in biology or ecology recommended). Three hours lecture. Insects and other arthropods (e.g., ticks, spiders) have extremely influential roles in our society. This course will cover how the era of rapid global change, including shifts in climate, international trade, and land use, impacts arthropods. Method of Instruction: C Method of Delivery: F &amp; O Campus: 1 &amp; 5 CIP: 260702 30 Char: Insects and Global Change Effective: Spring 2022</p>
<p>+Online/Distance <u>EPP 8273</u></p>	<p><b>Approved</b></p>	<p><b>EPP 8273 Approval to Offer Online Campus 5 for Empirical Research in Theory and Practice.</b> Method of Delivery: F &amp; O Campus: 1 &amp; 5 Effective: Spring 2022</p>
<p>Addition <u>FDM 3583</u> +Online/Distance</p>	<p><b>Approved</b></p>	<p><b>FDM 3583 Excel and Retail Operations.</b> (3). Three hours lecture. Extensive study of Microsoft Excel as it relates to Retail Operations with an emphasis on the practical retail-specific business applications. The course will provide comprehensive coverage of features available within the application as they relate to the retail operations such as formulas/functions, and data interpretation/presentation. Method of Instruction: C Method of Delivery: F &amp; O Campus: 1 &amp; 5 CIP: 190901 30 Char: Excel and Retail Operations Effective: Spring 2022</p>

Modification	<u>FDM 8100</u>	<b>Tabled</b>	<b>FDM 8100 Creative Component Project in Fashion Design and Merchandising.</b>
Addition +Online/Distance	<u>FNH 2201</u>	<b>Approved</b>	<b>FNH 2201 Nutrition and Dietetics Career Planning.</b> (1). (Prerequisite: FSNHP major - Food and Nutrition concentration or consent of instructor). One hour lecture. The course will introduce students to academic pathways, professional communication skills, and opportunities leading to success in the nutrition and dietetics profession. Method of Instruction: C Method of Delivery: F & O Campus: 1 & 5 CIP: 513102 30 Char: Nutr & Dietetic Career Pln Effective: Spring 2022
Addition +Online/Distance	<u>FNH 4323</u>	<b>Approved</b>	<b>FNH 4323 Professional Skills for Nutrition and Dietetics.</b> (3). (Prerequisite FNH 2201; Junior or Senior Standing). Three hours lecture. Prepares students to develop professional skills necessary to initiate a career in the field of dietetics emphasizing scope of practice, code of ethics, evaluation and use of professional literature, leadership, team building, cultural humility, and effective communication. Method of Instruction: C Method of Delivery: F & O Campus: 1 & 5 CIP: 513102 30 Char: Prof Skills for Nutr and Diet Effective: Spring 2022
Modification +Online/Distance	<u>FNH 8243</u>	<b>Passed Contingent</b>	<b>FNH 8243 Public Health Nutrition.</b>
Addition +Online/Distance	<u>HDFS 8523</u>	<b>Approved</b>	<b>HDFS 8523 Assessment Practices in Early Intervention.</b> (3). (Three hours lecture). Assessment as it relates specifically to working with infants, toddlers and preschool children and their families. Topics to be covered will include Special Education Law, IFSP/IEP development, and related topics. Method of Instruction: C Method of Delivery: O Campus: 5 CIP: 131015 30 Char: Assessment Prac in EI Effective: Spring 2022

Addition +Online/Distance <u>PSS 4473/6473</u>	<b>Approved</b>	<b>PSS 4473/6473 Hydroponic and Soilless Crop Production.</b> (3). (Prerequisite: PSS 4343/6343). Three hours lecture. The fundamentals of growing crops using hydroponics and soilless culture, particularly in controlled environments such as greenhouses and vertical farms. Method of Instruction: C Method of Delivery: O Campus: 1 & 5 CIP: 010604 30 Char: Hydroponic/Soilless Crop Prod Effective: Spring 2022
+Online/Distance <u>PSS 4553/6553</u>	<b>Approved</b>	<b>PSS 4553/6553 Approval to Offer Online Campus 5 for Plant Growth and Development.</b> Campus: 1 & 5 Effective: Spring 2022
Modification +Campus 1 <u>PSS 6013</u> (split level with 4013)	<b>Approved</b>	<b>FROM: PSS 4013/6013 Principles of Floral Design.</b> (3). Online course. 2 hours lectures, 2 hours lab. Focus on design principles, value-added products and longevity. <b>TO: PSS 4013/6013 Principles of Floral Design II.</b> (3). (Prerequisite: PSS 2343). Two hours lecture. Two hours laboratory. An in-depth inquiry into advanced floral design theory, advanced floral design techniques, and requirements for becoming a certified floral designer through the American Institute of Floral Design. Method of Delivery: F & O Campus: 1 & 5 Effective: Fall 2022
Modification +Online/Distance <u>PSS 8553</u>	<b>Approved</b>	<b>FROM: PSS 8553 Phytohormones and Growth Regulation.</b> (3). (Prerequisites: BIO 4214/6214 and CH 2503). Three hours lecture. Plant growth regulating compounds: synthesis, metabolism, and effects on plant growth and development. <b>TO: PSS 8553 Phytohormones and Growth Regulations.</b> (3). (Prerequisites: BIO 4214/6214 or PSS 4113/6113 and CH 2503). Three hours lecture. Plant growth regulating compounds: synthesis, metabolism, and effects on plant growth and development. Method of Delivery: F & O Campus: 1 & 5 Effective: Fall 2023

Modification +Online/Distance	<u>PSS 8811</u>	<b>Approved</b>	<p><b>FROM: PSS 8811 Seminar.</b> (1). (Prerequisites: Graduate Standing). Review of literature on assigned topics; preparation of formal papers and presentation of them at staff seminars.</p> <p><b>TO: PSS 8811 Graduate Seminar.</b> (1). (Prerequisites: Graduate Standing). One hour lecture. Review of literature on assigned topics; preparation of formal papers and presentation of them at staff seminars. Method of Delivery: F &amp; O Campus: 1 &amp; 5 Effective: Fall 2022</p>
Modification +Online/Distance	<u>PSS 8821</u>	<b>Approved</b>	<p><b>FROM: PSS 8821 Seminar.</b> (1). (Prerequisites: Graduate Standing). Review of literature on assigned topics; preparation of formal papers and presentation of them at staff seminars.</p> <p><b>TO: PSS 8821 Graduate Seminar.</b> (1). (Prerequisites: Graduate Standing). One hour lecture. Review of literature on assigned topics; preparation of formal papers and presentation of them at staff seminars. Method of Delivery: F &amp; O Campus: 1 &amp; 5 Effective: Fall 2022</p>
Modification +Online/Distance	<u>PSS 8831</u>	<b>Approved</b>	<p><b>FROM: PSS 8831 Seminar.</b> (1). (Prerequisites: Graduate Standing). Review of literature on assigned topics; preparation of formal papers and presentation of them at staff seminars.</p> <p><b>TO: PPSS 8831 Graduate Seminar.</b> (1). (Prerequisites: Graduate Standing). One hour lecture. Review of literature on assigned topics; preparation of formal papers and presentation of them at staff seminars. Method of Delivery: F &amp; O Campus: 1 &amp; 5 Effective: Fall 2022</p>

## ARCHITECTURE, ART AND DESIGN

Modification	<u>ARC 2713</u>	Passed Contingent	<b>ARC 2713 Environmental Building Systems I.</b>
Modification	<u>ARC 3723</u>	Passed Contingent	<b>ARC 3723 Environmental Building Systems II.</b>
Addition + Gen. Ed.	<u>ART 2063</u>	Approved	<b>ART 2063 Global Contemporary Art. (3).</b> Three hours lecture. This course examines the role of visual culture in the age of globalization. Throughout the semester, students will learn various approaches to visual culture studies using theoretical, practical, creative, and philosophical frameworks. Method of Instruction: C Method of Delivery: F Campus: 1 CIP: 500703 30 Char: Global Contemporary Art Gen. Ed. Fine Arts Effective: Spring 2022
Addition	<u>ART 4153</u>	Approved	<b>ART 4153 Art in the City. (3).</b> Three hours lecture. Juniors and seniors only. This course will examine the development and implementation of urban arts projects within a diverse array of social, culture, and political contexts. Method of Instruction: C Method of Delivery: F Campus: 1 CIP: 500703 30 Char: Art in the City Effective: Spring 2022
Modification +Gen. Ed.	<u>BCS 2713</u>	Passed Contingent	<b>BCS 2713 Environmental Building Systems I.</b>
Modification +Online/Distance	<u>BCS 3723</u>	Passed Contingent	<b>BCS 3723 Environmental Building Systems II.</b>
Addition	<u>ID 4773/6773</u>	Approved	<b>ID 4773/6773 Historic Lighting Environments. (3).</b> Three hours lecture. A split level interdisciplinary course focusing on historic lighting design. The class will study the emerging lighting technologies that increase efficiency, and improve light quality, while respecting the era, textures, architectural scene and landscape of historic structures. Method of Instruction: C Method of Delivery: F Campus: 1 CIP: 301201 30 Char: Historic Lighting Environments Effective: Spring 2022

## ARTS AND SCIENCES

Addition	<u>AN 3563</u>	Approved	<p><b>AN 3563 Data Analytics for Anthropology.</b> (3). (Prerequisite: AN1143, AN1344, and AN1543, or consent of instructor). Three hours lecture. Analytical methods for Anthropology with an emphasis on constructing research questions, data acquisition, quantitative methods, and visualizing results. Method of Instruction: C Method of Delivery: F Campus: 1 CIP: 450299 30 Char: Data Analytics for Anthro Effective: Spring 2022</p>
+Online/Distance	<u>EN 2503</u>	Approved	<p><b>EN 2503 Approval to Offer Online Campus 5 for Teaching Grammar.</b> Method of Delivery: F &amp; O Campus: 1, 2, &amp; 5 Effective: Fall 2022</p>
Modification	<u>EN 4903/6903</u>	Approved	<p><b>FROM: EN 4903/6903 Nineteenth-Century American Literature.</b> (3). (Prerequisite: Completion of English requirements in the student's major). Three hours lecture. Studies of topics in American literature from 1800-1900. <b>TO: EN 4903/6903 Nineteenth-Century U.S. Literature.</b> (3). (Prerequisite: Completion of English requirements in the student's major). Three hours lecture. Studies of topics in U.S. literature from 1800-1900. 30 Char: Nineteenth-Century U.S. Lit Effective: Spring 2022</p>
+Online/Distance	<u>FLI 1123</u>	Approved	<p><b>FLI 1123 Approval to Offer Online Campus 5 for Italian II.</b> Method of Delivery: F &amp; O Campus: 1 &amp; 5 Effective: Spring 2022</p>
Addition	<u>FLI 3233</u>	Approved	<p><b>FLI 3233 Advanced Italian Conversation.</b> (3). (Pre-requisite: FLI 2143 or consent of instructor). Three hours lecture. Advanced instruction in Italian with emphasis on oral and written communication skills. This course is conducted entirely in Italian and features extensive discussions of contemporary Italy and grammar review Method of Instruction: C Method of Delivery: F Campus: 1 CIP: 160902 30 Char: Advanced Italian Conversation Effective: Spring 2022</p>

Technical Change +Meridian	<u>FLS 2133</u>	Approved	<b>FLS 2113 Approval to Offer Meridian Campus 2 for Spanish III.</b> Campus: 1, 2, 5, & 8 Effective: Spring 2022
Addition	<u>GG 4643/6643</u>	Approved	<b>GG 4643/6643 Structural Geology for Industry Applications.</b> (3). Two hours lecture, two hours lab. Investigation into geomechanical models of the subsurface as they pertain to the development and failure of geological structures, with emphasis on the effect of structures and stresses in industrial drilling. Method of Instruction: B Method of Delivery: F Campus: 1 CIP: 400601 30 Char: Structure for Industry Effective: Spring 2022
Technical Change	<u>MA 2113</u>	Approved	<b>FROM: MA 2113 Introduction to Statistics.</b> (3). (Prerequisite: ACT Math subscore 24 (or higher for some sections) or grade of C or better in MA 1103 or MA 1313. Two hours lecture. Two hours laboratory. Introduction to descriptive statistics, random variables, probability distributions, estimation, confidence intervals, & hypothesis testing. Computer instruction for analysis. (Same as ST 2113). <b>TO: MA 2113 Introduction to Statistics.</b> (3). (Prerequisite: ACT Math subscore 24(or higher for some sections) or grade of C or better in MA1103 or MA 1313 or MA1213. Two hours lecture. Two hours laboratory. Introduction to descriptive statistics, random variables, probability distributions, estimation, confidence intervals, & hypothesis testing. Computer instruction for analysis.(Same as ST 2113). Effective: Fall 2022
Addition +Online/Distance	<u>PPA 8164</u>	Tabled	<b>PPA 8164 Strategic Change and Management.</b>
Addition +Online/Distance	<u>PPA 8843</u>	Approved	<b>PPA 8843 Introduction to Public Procurement.</b> (3). Three hours lecture. This course provides a bridge between the theory and practice associated with public sector procurement in this ever-evolving field. Method of Instruction: C Method of Delivery: F & O Campus: 1 & 5 CIP: 440401 30 Char: Introduction to Public Procurement Effective: Spring 2022



Addition +Online/Distance	<u>PPA 8853</u>	<b>Approved</b>	<b>PPA 8853 Contract Formation in Public Procurement.</b> (3). Three hours lecture. This course provides insight into how public sector contracts should be planned and formed. Method of Instruction: C Method of Delivery: F & O Campus: 1 & 5 CIP: 440401 30 Char: Contract Form in Public Proc Effective: Spring 2022
Addition +Online/Distance	<u>PPA 8863</u>	<b>Approved</b>	<b>PPA 8863 Contract Administration in Public Procurement.</b> (3). Three hours lecture. This course addresses the actions that must be taken following the award of a contract. Method of Instruction: C Method of Delivery: F & O Campus: 1 & 5 CIP: 440401 30 Char: Contract Admin in Public Proc Effective: Spring 2022
Addition +Online/Distance	<u>PPA 8873</u>	<b>Approved</b>	<b>PPA 8873 Legal, Ethical, and Socially Responsible Aspects of Public Procurement.</b> (3). Three hours lecture. This course surveys the law and ethics that apply to public sector procurement in the United States. Method of Instruction: C Method of Delivery: F & O Campus: 1 & 5 CIP: 440401 30 Char: Law and Ethics in Public Proc Effective: Spring 2022
Addition +Online/Distance	<u>PPA 8893</u>	<b>Approved</b>	<b>PPA 8893 Women in Public Administration.</b> (3). Three hours lecture. This course designed for students who are interested to learn and understand the changing role of women as administrators, leaders and managers. Method of Instruction: C Method of Delivery: F & O Campus: 1 & 5 CIP: 449999 30 Char: Women in Public Administration Effective: Spring 2022

<p>Addition</p> <p><u>SJ 1303</u></p>	<p>Approved</p>	<p><b>SJ 1303 Introduction to Social Justice Studies.</b> (3). Three hours lecture. Introductory examination of contemporary justice realities to understand the dynamics of oppression; linking competing theories of social justice to hierarchies grounded in race, ethnicity, nationality, gender, class, and sexuality, and to particular strategies for social transformation and change. (Same as GS 1303 and SO 1303).  Method of Instruction: C  Method of Delivery: F  Campus: 1 &amp; 2  CIP: 451101  40 Char: Intro to Social Justice  Effective: Spring 2022</p>
<p>Technical Change</p> <p><u>SO 1303</u></p>	<p>Approved</p>	<p><b>FROM: SO 1303 Introduction to Social Justice Studies.</b> (3). Three hours lecture. Introductory examination of contemporary justice realities in order to understand the dynamics of oppression; linking competing theories of social justice to hierarchies grounded in race, ethnicity, nationality, gender, class, and sexuality, and to particular strategies for social transformation and change. (Same as GS 1303).  <b>TO: SO 1303 Introduction to Social Justice Studies.</b> (3). Three hours lecture. Introductory examination of contemporary justice realities to understand the dynamics of oppression; linking competing theories of social justice to hierarchies grounded in race, ethnicity, nationality, gender, class, and sexuality, and to particular strategies for social transformation and change. (Same as GS 1303 and SJ 1303).  Effective: Spring 2022</p>

## BUSINESS

Technical Change	<u>MKT 4533</u>	Approved	<p><b>FROM: MKT 4533 Marketing Research.</b> (3). (Prerequisites: BQA 3123 and MKT 3013). Three hours lecture. Study of modern marketing research techniques and their applications. Scope and purpose of marketing research: planning of surveys; collecting and analysis of data; preparation of reports.</p> <p><b>TO: MKT 4533 Marketing Research.</b> (3). (Prerequisites: MKT 3013 and BQA 3123 or equivalent [or co-enrollment in BQA 3123]). Three hours lecture. Study of modern marketing research techniques and their applications. Scope and purpose of marketing research: planning of surveys; collecting and analysis of data; preparation of reports.</p> <p>Effective: Fall 2022</p>
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## EDUCATION

Technical Change +Meridian	<u>COE 8143</u>	Approved	<p><b>COE 8143 Approval to Offer Meridian Campus 2 for Grief Counseling for Loss and Bereavement.</b></p> <p>Campus: 1 &amp; 2</p> <p>Effective: Summer 2022</p>
Technical Change +Meridian	<u>COE 8743</u>	Approved	<p><b>COE 8743 Approval to Offer Meridian Campus 2 for Counseling LGBTQ: Awareness, Mental Health &amp; Advocacy.</b></p> <p>Campus: 1, 2, &amp; 5</p> <p>Effective: Summer 2022</p>
Technical Change +Meridian	<u>COE 8753</u>	Approved	<p><b>COE 8753 Approval to Offer Meridian Campus 2 for Stress Management Counseling.</b></p> <p>Campus: 1 &amp; 2</p> <p>Effective: Summer 2022</p>
Modification +Online/Distance	<u>EDF 3413</u>	Approved	<p><b>FROM: EDF 3413 Writing for Thinking.</b> (3). (Prerequisites: Completion of EN 1103 and 1113 or equivalent with grade of C or better in each and junior standing). Two hours lecture. Two hours laboratory. Designed to enhance participants' writing/thinking skills and to prepare participants to use writing as a learning process with groups they teach or lead.</p> <p><b>TO: EDF 3413 Writing for Thinking.</b> (3). (Prerequisites: EN 1103 and 1113 or equivalent). Three hours lecture. Designed to enhance participants' writing/thinking skills and to prepare participants to use writing as a learning process with groups they teach or lead.</p> <p>Method of Instruction: C</p> <p>Method of Delivery: F &amp; O</p> <p>Campus: 1, 2 &amp; 5</p> <p>Effective: Summer 2022</p>

Technical Change +Meridian	<u>EDF 8553</u>	Approved	<b>EDF 8553 Approval to Offer Meridian Campus 2 for Research in the Classroom.</b> Campus: 2 & 5 Effective: Summer 2022
Technical Change	<u>EDS 4533/6533</u>	Approved	<b>EDS 4533/6533 Approval to Offer Meridian Campus 2 for Teaching Science with Virtual Reality.</b> Campus: 1, 2, & 5 Effective: Summer 2022
Addition	<u>PE 1281</u>	Approved	<b>PE 1281 Self-Defense.</b> (1). Two hours laboratory. Emphasis is on basic self-defense skills, escape and avoidance strategies, offensive and defensive postures, defensive techniques and simulated attacks. Method of Instruction: L Method of Delivery: F Campus: 1 CIP: 131314 30 Char: Self-Defense Effective: Spring 2022

## ENGINEERING

Addition	<u>ABE 4463/6463</u>	Approved	<p><b>ABE 4463/6463 Introduction to Imaging in Biological Systems.</b> (3). (Prerequisites: senior or graduate standing in an engineering discipline, or consent of instructor). Three hours lecture. Comprehensive introduction to imaging modalities and image processing and analysis methods in biosystems contexts. Imaging applications in precision agriculture, plant phenotyping, postharvest food inspection, and biomedical diagnosis.</p> <p>Method of Instruction: C Method of Delivery: F Campus: 1 CIP: 140301 30 Char: Intro to Imagining in Biol Syst Effective: Spring 2022</p>
Technical Change	<u>ASE 2113</u>	Approved	<p><b>FROM: ASE 2113 Introduction to Aircraft and Spacecraft Performance.</b> (3). (Prerequisite: AS 2013 and grade of C or better in MA 1723 and PH 2213). Three [sic] hours lecture. Introduction to general aerodynamics, propulsive and structural considerations of flight mechanics, quasi-steady flight; accelerated and maneuvering flight; launch [sic] vehicle performance [sic]</p> <p><b>TO: ASE 2113 Introduction to Aircraft and Spacecraft Performance.</b> (3). (Prerequisite: ASE 1013 and CSE 1233 and grade of C or better in MA 1723 and PH 2213). Three hours lecture. Introduction to general aerodynamics, propulsive and structural considerations of flight mechanics, quasi-steady flight; accelerated and maneuvering flight; launch vehicle performance.</p> <p>Effective: Fall 2022</p>
Modification	<u>CE 4563/6563</u>	Passed Contingent	<b>CE 4563/6563 Sedimentation Engineering.</b>
Modification +Online/Distance	<u>CE 4583/6583</u>	Passed Contingent	<b>CE 4583/6583 Stream Restoration.</b>
+Online/Distance	<u>ECE 3714</u>	Approved	<p><b>ECE 3714 Approval to Offer Online Campus 5 for Digital Devices and Logic Design.</b></p> <p>Method of Delivery: F &amp; O Campus: 1, 2, 5, &amp; 6 Effective: Spring 2022</p>
+Online/Distance	<u>ECE 3724</u>	Approved	<p><b>ECE 3724 Approval to Offer Online Campus 5 for Microprocessors.</b></p> <p>Method of Delivery: F &amp; O Campus: 1, 2, 5, &amp; 6 Effective: Spring 2022</p>

+Online/Distance	<u>IE 4553/6553</u>	Approved	<b>IE 4553/6553 Approval to Offer Online Campus 5 for Engineering Law and Ethics.</b> Method of Delivery: F & O Campus: 1, 2, 5 & 6 Effective: Spring 2022
Modification	<u>ME 2133</u>	Approved	<b>FROM: ME 2133 Modeling and Manufacturing.</b> (3). (Prerequisite: Grade of C or better in ME 1111 and Sophomore standing). Two hours lecture. Three hours laboratory. Elementary drafting and design techniques using solid modeling software: introduction to manufacturing options. <b>TO: ME 2133 Modeling and Manufacturing.</b> (3). (Prerequisite: Grade of C or better in ME 1111 and Sophomore standing). Two hours lecture. Three hours laboratory. Introduction to industry standard safety practices, measuring tools and applications, manufacturing and fabrication options, assembly best practices, as well as elementary drafting and design techniques using solid modeling software. Campus: 1 & 6 Method of Delivery: F Effective: Fall 2022

2. Program Proposals by college/school:

**ACADEMIC AFFAIRS**

Addition	<b>Degree:</b> BS <b>Major:</b> Data Science <b>Concentrations:</b> Visualization and Visual Analytics for Built Environment; Computational Agriculture and Natural Resources; Business Information Systems; Marketing and Supply Chain Analysis; Social Data Analysis; Psychoinformatics; Statistical Modeling; Computational Intelligence; Geoinformatics	<b>Approved</b>	Forwarded to Provost and President for submission to IHL.
Addition	<b>Degree:</b> Certificate (Graduate) <b>Major:</b> Data Science Pedagogy	<b>Approved</b>	Approved by Graduate Council.  Forwarded to Provost and President for submission to IHL.

**AGRICULTURE AND LIFE SCIENCES**

Modification	<b>Degree:</b> BS <b>Major:</b> Food Science, Nutrition and Health Promotion, <b>Concentration:</b> Food and Nutrition	<b>Approved</b>	See proposal for list of revisions.  Effective: Fall 2022
+Distance	<b>Degree:</b> MS <b>Major:</b> Plant and Soil Sciences <b>Concentrations:</b> Agronomy; Horticulture; Weed Science	<b>Approved</b>	Approved by Graduate Council.  Effective: Fall 2022
+Distance	<b>Degree:</b> PhD <b>Major:</b> Plant and Soil Sciences <b>Concentrations:</b> Agronomy, Horticulture, Weed Science	<b>Approved</b>	Approved by Graduate Council.  Effective: Fall 2022
Modification	<b>Degree:</b> MS <b>Major:</b> Fashion Design and Merchandising <b>Concentrations:</b>	<b>Approved</b>	See proposal for list of revisions. Approved by Graduate Council.  Effective: Fall 2022

**ARCHITECTURE, ART AND DESIGN**

Modification	<b>Degree:</b> BArch <b>Major:</b> Architecture	<b>Passed Contingent</b>	
Modification	<b>Degree:</b> BS <b>Major:</b> Building Construction Science	<b>Passed Contingent</b>	

## EDUCATION

Modification	<b>Degree:</b> Ed.D. <b>Major:</b> Education <b>Concentration:</b> Educational Leadership to P-12 Leadership	<b>Approved</b>	Revision of concentration name. Approved by Graduate Council.  Effective: Summer 2022
Modification	<b>Degree:</b> PhD <b>Major:</b> Counselor Education	<b>Passed Contingent</b>	
Modification	<b>Degree:</b> PhD <b>Major:</b> Student Counseling and Guidance	<b>Passed Contingent</b>	

## ENGINEERING

Modification	<b>Degree:</b> BS <b>Major:</b> Computer Engineering	<b>Passed Contingent</b>	
+Distance	<b>Degree:</b> BS <b>Major:</b> Electrical Engineering	<b>Approved</b>	Addition of distance education.  Effective: Fall 2022
Modification	<b>Degree:</b> MS <b>Major:</b> Industrial and Systems Engineering <b>Concentrations:</b> Human Factors and Ergonomics; Industrial Systems; Operations Research; Management Systems Engineering; Manufacturing Systems; Data Analytics	<b>Approved</b>	See proposal for list of revisions. Approved by Graduate Council.  Effective: Fall 2022
Modification	<b>Degree:</b> PhD <b>Major:</b> Electrical and Computer Engineering	<b>Approved</b>	See proposal for list of revisions. Approved by Graduate Council.  Effective: Fall 2022
Modification	<b>Degree:</b> PhD <b>Major:</b> Biomedical Engineering	<b>Approved</b>	See proposal for list of revisions. Approved by Graduate Council.  Effective: Fall 2022

## FOREST RESOURCES

Technical Change	<b>Degree:</b> BS <b>Major:</b> Forestry <b>Concentrations:</b> Environmental Conservation, Forest Management, Forest Products, Urban Forestry, Wildlife Management, Forest Business	<b>Approved</b>	See proposal for list of corrections to program of study.  Effective: Fall 2022
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All of the proposals were approved with the exception of the following:

Proposals\*\*

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\_\_\_\_\_  
Dr. Peter L. Ryan  
Executive Vice Provost for Academic Affairs

  
\_\_\_\_\_  
Date

APPROVAL FORM FOR  
**DEGREE PROGRAMS**  
MISSISSIPPI STATE UNIVERSITY

**NOTE:** This form is a cover sheet that must accompany the degree program change proposal. The actual proposal should be prepared in accordance with format requirements provided in the *Guide and Format for Curriculum Proposals* published by the UCCC. Both cover sheet and proposal should be submitted to UCCC Mail Stop 9702 (281 Garner Hall), Phone: 325-9410.

**College:** Academic Affairs    **Department:** Office of the Provost and executive Vice President

**Contact Person:** Dr. Mimmo Parisi    **Mail Stop:** 9723    **Email:** m.parisi@msstate.edu  
**Nature of Change:** New Degree    **Date Initiated:** 03/10/22    **Effective Date:** Fall 2022

**New Degree Program Name:** Bachelor of Science

**Major:** Data Science    **Concentration:** The degree will offer 9 concentrations.

1. Visualization and Visual Analytics for Built Environment: College of Architecture, Art, and Design
2. Computational Agriculture and Natural Resources: College of Agriculture and Life Sciences and the College of Forest Resources
3. Business Information Systems: College of Business
4. Marketing and Supply Chain Analysis: College of Business
5. Social Data Analysis: College of Arts and Sciences
6. Psychoinformatics: College of Arts and Sciences
7. Statistical Modeling: College of Arts and Sciences
8. Computational Intelligence: Bagley College of Engineering
9. Geoinformatics: College of Arts and Sciences

**Summary of Proposed Changes:**

The Office of the Provost and Executive Vice President requests that a new BS degree program in Data Science be offered. Data Science experts are currently among the most sought professionals in the labor market because they allow businesses and organizations to place data at the center of their solutions. Furthermore, there are no undergraduate programs that meets the educational skill requirements for preparing data science experts.

**Approved:**

**Date:**

\_\_\_\_\_  
Department Head

N/A

\_\_\_\_\_  
Chair, College or School Curriculum Committee

\_\_\_\_\_  
Dean of College or School



Chair, University Committee on Courses and Curricula

5/2/2022

Chair, Graduate Council(if applicable)



Chair, Deans Council

12<sup>th</sup> May, 2022

APPROVAL FORM FOR  
**DEGREE PROGRAMS**  
MISSISSIPPI STATE UNIVERSITY

NOTE: This form is a cover sheet that must accompany the degree program change proposal. The actual proposal should be prepared in accordance with format requirements provided in the *Guide and Format for Curriculum Proposals* published by the UCCC. Both cover sheet and proposal should be submitted to UCCC Mail Stop 9702 (281 Garner Hall), Phone: 325-9410.

**College:** Academic Affair    **Department:** Office of the Provost and executive Vice President

**Contact Person:** Dr. Mimmo Parisi    **Mail Stop:** 9723    **Email:** m.parisi@msstate.edu  
**Nature of Change:** New Degree    **Date Initiated:** 03/10/22    **Effective Date:** Fall 2022

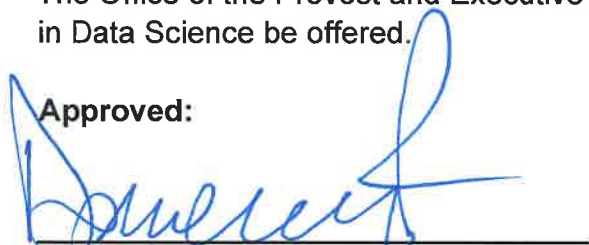
**New Degree Program Name:** Bachelor of Science

**Major:** Data Science    **Concentration:** The degree will offer 9 concentrations.

**Summary of Proposed Changes:**


The Office of the Provost and Executive Vice President requests that a new BS degree program in Data Science be offered.

**Approved:**

  
\_\_\_\_\_

Department Head

**Date:**

  
\_\_\_\_\_

N/A

\_\_\_\_\_  
Chair, College or School Curriculum Committee

  
\_\_\_\_\_

Dean of College or School

  
\_\_\_\_\_

\_\_\_\_\_  
Chair, University Committee on Courses and Curricula

\_\_\_\_\_  
Chair, Graduate Council(if applicable)

\_\_\_\_\_  
Chair, Deans Council

## NEW DEGREE OUTLINE FORM

Use the chart below to indicate your new degree outline. If any General Education (Core) course is acceptable in the category, please indicate by saying “any Gen Ed course”. There is no need to type in the whole list. Expand rows as needed.

<p><b>PROPOSED New Degree</b></p> <p>Degree: Bachelor of Science  Major: Data Science  Concentrations:</p> <ol style="list-style-type: none"> <li>1. Visualization and Visual Analytics for Built Environment: College of Architecture, Art, and Design</li> <li>2. Computational Agriculture and Natural Resources: College of Agriculture and Life Sciences and the College of Forest Resources</li> <li>3. Business Information Systems: College of Business</li> <li>4. Marketing and Supply Chain Analysis: College of Business</li> <li>5. Social Data Analysis: College of Arts and Sciences</li> <li>6. Psychoinformatics: College of Arts and Sciences</li> <li>7. Statistical Modeling: College of Arts and Sciences</li> <li>8. Computational Intelligence: Bagley College of Engineering</li> <li>9. Geoinformatics: College of Arts and Sciences</li> </ol>
<p><b>New Degree Description</b></p> <p>The Bachelor of Science in Data Science is an interdisciplinary program that draws upon disciplines from multiple colleges. It is a 123-hour inter-college program designed to include three general areas of coursework: general education, program core, and applications of the data science fundamentals in specific body of knowledge such as geoinformatics, computational intelligence and cybersecurity, marketing, management information systems, statistical modeling, social science analytics, architectural design and built environment, and smart agriculture. The overall curriculum is designed to provide students with an ideal educational experience necessary to become effective professional data science experts. Under the proposed undergraduate curriculum, general education coursework will help data science students develop intellectual curiosity, critical thinking, and ethical and aesthetic awareness. The coursework for the core program will provide students with the opportunity to build a strong foundation in the key fields of data science that include computer science, mathematics and statistics, management information systems, communication, management / leadership, design, and ethics. The course sequences for several distinct areas of academic concentration will provide students with the opportunity to become data science experts in a specific area.</p>
<p><b>Concentration Description</b></p> <ol style="list-style-type: none"> <li>a. The Visualization and Visual Analytics for Built Environment concentration focuses on visualization techniques and smart analytics to leverage data across the full project lifecycle from design development, construction, and operations to increase efficiency and enhance productivity. The design and construction process for the built environment is rapidly transforming, driven by two primary forces. Architects and designers are increasingly adopting Building Information Modeling (BIM) techniques that allow more sustainable, accurate, and efficient design, planning,</li> </ol>

evaluation, and construction of the built environment. Rapid integration of IoT sensors and intelligent building systems that track every aspect of building performance complements the digital revolution in the design process. However, the data visualization and analytics efforts have significantly lagged behind data capture efforts by integrating IoT sensors in smart buildings. This gap presents an opportunity for a new class of professionals at the intersection of data science and design visualization. The industry needs new professionals who can bring together computational statistics and data analytic skills with visualization skills to inform the development of new workflows and strategies for the design and construction industries. Courses in this concentration train aim to fill this gap by preparing students in three complementary areas:

- Provide a foundation in basic principles of design and digital representation drawing from traditional art and design disciplines
- Develop advanced design visualization skills using state-of-the-art computer-aided design (CAD) and building information modeling (BIM) software tools used in the architecture, engineering, and construction industries
- Develop an understanding of advanced building systems and building performance simulations and evaluations

The fundamental discipline courses in this concentration thus introduce visualization and analytics techniques that support the entire building project lifecycle from design development, construction, and operation to increase efficiency and enhance performance. The two data science capstone projects for this concentration provide opportunities to engage in real-world problem-based learning by bringing together foundational data science skills with visualization and analytic skills developed as part of the concentration.

- b. The Computational Agriculture and Natural Resources (CANR) concentration trains students interested in data-driven careers in agriculture and natural resources through subject matter and applied data science coursework. Students who complete the CANR concentration will be equipped for careers as data science experts in agricultural production, agricultural technology, agricultural finance, natural resource management, wildlife and fisheries science, plant science, and other related fields.
- c. Business Information Systems focuses on applying data science to solve business problems in the context of digital transformation. Modern enterprise management presents complex challenges of identifying actionable knowledge derived from the emerging flood of new data captured by an exploding number of online processes and connected sensors and devices. Companies are redesigning their organizational structures and processes to leverage this new capability – the concentration in BIS will prepare students to play a leading role in this emerging digital transformation and help companies compete in the increasingly connected environment. Students will combine their in-depth understanding of business processes with the ability to apply data science techniques to analyze business data, enabling them to aid strategic decision making. The concentration in BIS prepares students to solve business problems and identify business opportunities in the context of intelligent data analytics and digital transformation. Students will master these skills through learning exercises and real-world projects, engaging in projects to develop and implement a data-driven decision process or solution based on data mining, artificial intelligence, machine learning, and knowledge discovery of hidden relationships that can be exploited for new advances in business strategy. This experiential learning approach enables students to leverage their skillsets in a contextualized environment, complete with project management requirements, cost-benefit trade-offs, implementation obstacles (including financial, political, administrative, temporal, and legal barriers), team building and culture-building requirements, progress measurement methods, and complete life-cycle management of data science projects.
- d. Marketing and Supply Chain Analytics focuses on applying data science to solve problems relating to marketing and supply chain management using digital technologies. Marketing and supply chain functions are increasingly driven by data. Tasks such as analyzing online social media content, planning advertising campaigns across multiple online channels, designing cutting edge products, and delivering products through complex global supply chains, all require cutting edge data

analytics skills. The concentration in Marketing and Supply Chain Analytics prepares students to solve data-driven business problems relating to marketing and supply chain management. Fundamental discipline courses expose students to important principles in business. Core concentration courses include upper-level courses focused on marketing and supply-chain analytics. There is a strong focus on practical project-driven learning in this concentration, with several classes offering the chance to working on projects for local companies and non-profit organizations.

- e. Social Data Analytics focuses on applying data science to understand sociological and political aspects of social media communication. Social Data Analytics prepares students to apply data science to understand sociological and political aspects of social media communication. Fundamental discipline courses lay discipline-specific foundations in social science. Core concentration courses prepare students for more advanced work with social media sources.
- f. Psych informatics is subfield of psychology for the acquisition, organization, and synthesis of data collected from psychology to reveal information about psychological traits such as personality and mood. Psychology has historically relied on experiments and questionnaires to collect data. These methods face several disadvantages such as small number of participants and bias and unreliable memory. Psych informatics solves these problems by storing Big Data related to psychology (such as communications on smartphones or social media websites) and then data mining for relevant psychological information. This concentration prepares students to apply data science to the field of psychology. Fundamental discipline courses lay discipline-specific foundations in psychology. Core concentration courses prepare students for more advanced work with cognitive science and psychology. Students in the Psychology concentration are recommended to take PSY 1013 as their second required social science general education course.
- g. The Statistical Modeling concentration prepares students to apply advanced statistical methods to build analytical and statistical models. Core concentration courses prepare students for more advanced work in statistics. The concentration focuses on statistical models and methods that are needed to discover and validate patterns in Big Data. It includes upper-levels statistics and mathematics courses and a two-semester practicum to apply the theoretical machinery of quantitative methods to the solution of real-world problems involving Big-Data.
- h. Computational Intelligence focuses on understanding artificial intelligence and machine learning approaches to develop effective strategies to solve large-scale data science problems. This includes creation of new software tools, algorithms, and using existing programs and libraries. The concentration includes foundational courses in software development, algorithms, artificial intelligence, and machine learning. These ideas are then applied in various computer science-related contexts in upper-level courses and in a two-semester practicum.
- i. The Geoinformatics concentration includes courses in three categories within the Department of Geosciences, comprising a total of 30 hours, with a focus on geospatial data acquisition and analysis. This includes nine hours of required coursework related to: (1) statistical analysis of geospatial data, (2) analysis and visualization of spatial data using Geographic Information Systems (GIS), and (3) acquisition of spatial information from remote sensing platforms. A further 15 hours will consist of courses in meteorology/climatology, geospatial science, and/or geology, with specific courses chosen based on student interest. These courses serve as the basis for attaining core knowledge on the nature and processes related to geoscience data, which is critical for applying data science skills in an appropriate and representative way with respect to geospatial information. The courses also act to showcase the specific applications of data science within the geoscience community, which will help students define future research strategies and interests as well as prepare them for careers as data scientists and geoinformatics professionals. The final six-hour capstone course will provide a means to apply general and discipline-specific data science skills by working directly with one or more geoscience research faculty. The course will involve designing and completing a research-based project that requires acquiring, analyzing, and interpreting geospatial information using sound scientific principles and critical thinking. By

completing the Geoinformatics concentration within the Data Science BS, students will learn not only the skills and techniques required to be successful data scientists within the geospatial community, but also the knowledge necessary to make critical and relevant decisions within the scientific fields that rely on the collection and interpretation of spatial information.

Proposed Curriculum Outline	Required Hours
English (General Education): EN 1103 English Comp I or EN 1104 Expanded English Comp I EN 1113 English Comp II or EN 1173 Accelerated Comp II	6
Fine Arts (General Education): Any Gen Ed course	3
Natural Sciences 2 lab based sciences required by Gen. Ed.: Any Gen Ed course	6
Math (General Education): MA 1713 Calculus I MA 1723 Calculus II MA 2733 Calculus III	9
Humanities (General Education): PHI 1113 Intro to Logic (required) -Any Gen Ed course	6
Social/Behavioral Sciences (Gen Ed): DSCI 2013 Data Science Literacy (required) -Any Gen Ed course	6
Oral Communication: CO 3213 Small Group Communication	3
Technical Writing: CO 3223 Comm & Media Studies Research Methods	3
Major Core: MA 3123 Statistical Inference MA 3113 Introduction to Linear Algebra MA/ST 4523 Introduction to Probability CSE 1284 Introduction to Computer Programming CSE 1384 Intermediate Computer Programming CSE 2813 Discrete Structures CSE 2383 Data Structures and Analysis of Algorithms CSE 4503 Database Management Systems CSE 4633 Artificial Intelligence CSE 3763 Legal and Ethical Issues in Computing	51



BIS 3233 Management Information Systems  DSCI 3013 Fundamentals of Data Acquisition DSCI 2012 Data Science Lab - Data Wrangling DSCI 3012 Data Science Lab – Description, Analysis, and Inference DSCI 3022 Data Science Lab – Data Visualization DSCI 3032 Data Science Lab - Artificial Intelligence DSCI 2022 Data Science Lab - Cloud, Quantum, and High-Performance Computing DSCI 4013 Data Visualization	
Concentration Courses: The Coursework is reported below  Each area of concentration combines fundamental, field-specific content, concentration electives designed to apply data science to the field, and a six-hour practicum/capstone project. On their third year, students will have the opportunity to select a concentration area from the several available areas offered by the different colleges on campus.	30
Total Hours	123

### Concentration Coursework

#### Visualization and Visual Analytics for Built Environment

Category	Courses	Hours
Fundamental Discipline Courses	Complete <u>EIGHT</u> 3-credit courses out of the following <u>TEN</u> : <ul style="list-style-type: none"> <li>• ART 1123 Design I (2D)</li> <li>• ART 2803 Intro to Comp. Art</li> <li>• ART 2813 Intermediate Computing for Design</li> <li>• ART 4813 Multimedia I</li> <li>• BCS 2313 Virtual Design &amp; Construction</li> <li>• ID 3603 Digital Design for Interiors</li> <li>• ID 3363 3D CAD Modeling</li> <li>• ARC 2713 Passive Bldg. Systems</li> <li>• ARC 3723 Active Bldg. Systems</li> <li>• ARC 4633 Architecture and Virtual Spaces</li> </ul>	24
Capstone	Students will Register for the Following: <ul style="list-style-type: none"> <li>• DSCI 4553: Capstone Project 1 for Bachelor of Science in Data Science</li> <li>• DSCI 4663: Capstone Project 2 for Bachelor of Science in Data Science</li> </ul>	6
	Total	30

#### Computational Agriculture and Natural Resources

Category	Courses	Hours
Fundamental Discipline Courses	Choose 1 Course from the Following: <ul style="list-style-type: none"> <li>• AEC 2713 Introduction to Food and Resource Economics</li> <li>• ABE 1863 Engineering Technology in Agriculture</li> </ul>	6

	<ul style="list-style-type: none"> <li>• BCH 4013 Principles of Biochemistry</li> <li>• PSS 1313 Plant Science</li> <li>• ADS 1113 Animal Science</li> </ul> <p>Choose 1 Course from the Following:</p> <ul style="list-style-type: none"> <li>• SBP 1103 Introduction to Sustainable Bioproducts</li> <li>• WFA 3133 Applied Ecology</li> <li>• FO 4123 Forest Ecology</li> </ul>	
Core Concentration Courses	<p>Choose 6 Credit Hours from the Following:</p> <p><b>CALS:</b></p> <ul style="list-style-type: none"> <li>• EC 2113 Principles of Macroeconomics</li> <li>• EC 3123 Intermediate Microeconomics</li> <li>• AEC 2223 Introduction to Sustainability Economics</li> <li>• AEC 3133 Introductory Agribusiness Management</li> <li>• AEC 3233 Introduction to Environmental Economics and Policy</li> <li>• AEC 4123 Financial and Commodity Futures Marketing</li> <li>• ABE 2173 Principles of Agricultural and Off-Road Machines</li> <li>• ABE 2543 Precision Agriculture I</li> <li>• ABE 4543 Precision Agriculture II</li> <li>• BCH 3102 Essential Biochemical Concepts and Analysis</li> <li>• BCH 4414 Protein Methods</li> <li>• ADS 3013 Anatomy and Physiology</li> <li>• ADS 3313 Introduction to Meat Science</li> </ul> <p><b>CFR:</b></p> <ul style="list-style-type: none"> <li>• SBP 2012 Intro to Bioproducts Industries</li> <li>• SBP 2123 Materials and Processing of Structure Bioproducts</li> <li>• WFA 4313 Fisheries Management</li> <li>• WFA 4613 Landscape Ecology</li> <li>• FO 2213 Forest Measurements</li> <li>• FO 2443 Essentials of Biotechnology</li> <li>• FO 4113 Forest Resource Economics</li> <li>• FO 4123 Forest Ecology</li> </ul>	6
Applied Courses	<p>Choose 12 Credit Hours from the Following:</p> <p><b>CALS:</b></p> <ul style="list-style-type: none"> <li>• AEC 4133 Analysis of Food Markets and Prices</li> <li>• AEC 4223 Applied Quantitative Analysis in Agricultural Economics</li> <li>• AEC 4363 Economics of Precision Agriculture</li> <li>• AEC 4413 Public Problems of Agriculture</li> <li>• AEC 4733 Econometric Analysis in Agricultural Economics</li> <li>• ABE 2873 Land Surveying</li> <li>• ABE 3513 The Global Positional System and Geographic Information Systems in Agriculture and Engineering</li> <li>• ABE 4163 Machine Management Agro-Ecosystems</li> <li>• ABE 4263 Soil and Water Management</li> <li>• ABE 4463 Introduction to Imaging in Biological Systems</li> <li>• ABE 4483 Introduction to Remote Sensing Technologies</li> <li>• BCH 4803 Integrative Protein Evolution</li> <li>• PSS 4483 Introduction to Remote Sensing Technologies</li> </ul>	12

	<ul style="list-style-type: none"> <li>• ADS 4523 Internet Based Management in Livestock Industries</li> </ul> <p><b>CFR:</b></p> <ul style="list-style-type: none"> <li>• SBP 4013 Wood Anatomy</li> <li>• SBP 4253 Quantitative Methods in SBP</li> <li>• WFA 4123 Wildlife and Fisheries Biometrics</li> <li>• WFA 4243 Wildlife Techniques</li> <li>• WFA 4253 Application of Spatial Technologies to Wildlife Fisheries Management</li> <li>• FO 3015 Forest Description and Analysis</li> <li>• FO 4213 Forest Biometrics</li> <li>• FO 4313 Spatial Techniques in Natural Resources Management</li> <li>• FO 4453 Remote Sensing Applications</li> <li>• FO 4473 GIS for Natural Resource Management</li> </ul>	
Capstone	<p>Students will Register for the Following:</p> <ul style="list-style-type: none"> <li>• DSCI 4553: Capstone Project 1 for Bachelor of Science in Data Science</li> <li>• DSCI 4663: Capstone Project 2 for Bachelor of Science in Data Science</li> </ul>	6
	<b>Total</b>	<b>30</b>

### Business Information Systems

Category	Courses	Hours
Fundamental Discipline Courses	<p>Students will choose three courses from the following:</p> <ul style="list-style-type: none"> <li>• BL 2413 Legal Environment of Business</li> <li>• ACC 2013 Financial Accounting</li> <li>• ACC 2023 Managerial Accounting</li> <li>• EC 2113 Macro Economics</li> <li>• EC 2123 Macro Economics</li> <li>• FIN 3123 Financial Management</li> <li>• MGT 3113 Principles of Management</li> <li>• MKT 3013 Principles of Marketing</li> <li>• MKT 3323 International Logistics</li> </ul>	9
Core Concentration Courses	<ul style="list-style-type: none"> <li>• BQA 4423 Business Decision Analysis</li> <li>• BIS 4533 Decision Support Systems</li> <li>• BIS 4113 BIS Security Management</li> <li>• BIS 4753 Structured Systems Analysis and Design</li> </ul> <p>In addition, students will choose an elective from one 4000-level business course.</p>	15
Capstone	<p>Students will Register for the Following:</p> <ul style="list-style-type: none"> <li>• BIS 4763 BIS Senior Seminar (analytics project)</li> <li>• BQA 4413 Business Forecasting &amp; Predictive Analytics</li> </ul>	6
	<b>Total</b>	<b>30</b>

### Marketing and Supply Chain Analytics

Category	Courses	Hours
Fundamental Discipline Courses	<p>Students will take the following 2 Courses:</p> <ul style="list-style-type: none"> <li>• MKT 3013 Principles of Marketing</li> <li>• MKT 3323 International Logistics</li> </ul> <p>Students will choose two courses from the following:</p> <ul style="list-style-type: none"> <li>• BL 2413 Legal Environment of Business</li> <li>• ACC 2013 Financial Accounting</li> <li>• ACC 2023 Managerial Accounting</li> <li>• EC 2113 Macro Economics</li> <li>• EC 2123 Macro Economics</li> <li>• FIN 3123 Financial Management</li> <li>• MGT 3113 Principles of Management</li> </ul>	12
Core Concentration Courses	<p>Students will choose four courses from the following list.</p> <ul style="list-style-type: none"> <li>• BQA 4423 Business Decision Analysis</li> <li>• BIS 4533 Decision Support Systems</li> <li>• MKT 4533 Marketing Research</li> <li>• MKT 4213 Internet Marketing</li> <li>• MKT 4033 International Transportation</li> <li>• MKT 4013 Procurement</li> <li>• MKT 4313 Physical Distribution Management</li> </ul>	12
Capstone	<p>Students will Register for the Following:</p> <ul style="list-style-type: none"> <li>• MKT 4333 International Supply Chain Management</li> <li>• BQA 4413 Business Forecasting &amp; Predictive Analytics</li> </ul>	6
	Total	30

### Social Data Analytics

Category	Courses	Hours
Fundamental Discipline Courses	<p>From the following courses, choose 9 hours, but no more than 6 hours in any one field:</p> <ul style="list-style-type: none"> <li>• AN 1103 Intro to Anthropology</li> <li>• AN 1143 Intro to Cultural Anthropology</li> <li>• AN 1344 Intro to Bio Anthropology</li> <li>• CO 1403 Intro to Mass Media</li> <li>• GR 2313 Maps and Remote Sensing</li> <li>• PS 1313 Intro to International Relations</li> <li>• PS 1513 Comparative Government</li> <li>• PS 2703 Intro to Public Policy</li> <li>• CRM 1003 Crime and Justice in America</li> <li>• SO 1003 Intro to Sociology</li> <li>• SO 1103 Contemporary Social Problems</li> </ul>	9
Core Concentration Courses	<p>Choose 15 hours from the following 3-hour courses:</p> <ul style="list-style-type: none"> <li>• AN 3343 Intro to Forensic Anthropology</li> <li>• AN 4173 Environment and Society</li> <li>• AN 4163 Anthropology of International Development</li> </ul>	15

	<ul style="list-style-type: none"> <li>• AN 4323 Plagues and People</li> <li>• CO 4213 Political Communication</li> <li>• CO 4283 Health Communication</li> <li>• CRM 4253 White Collar and Computer Crime</li> <li>• GR 3303 Survey of Geospatial Technologies</li> <li>• GR 4123 Urban Geography</li> <li>• PS 4243 State Election Policy and Politics</li> <li>• PS 4283 Public Opinion</li> <li>• PS 4293 Political Behavior</li> <li>• PS 4343 International Conflict and Security</li> <li>• PS 4373 International Terrorism</li> <li>• PS 4464 Political Analysis</li> <li>• PS 4523 Democracy and Inequality</li> <li>• PS 4613 Civil Wars and Intra-State Conflict</li> <li>• SO 3303 Rural Sociology</li> <li>• SO 4113 Social Organization and Change</li> <li>• SO 4123 Poverty, Analysis: People, Organization, and Program</li> <li>• SO 4173 Environment and Society</li> </ul>	
Capstone	<p>Students will Register for the Following:</p> <ul style="list-style-type: none"> <li>• DSCI 4553: Capstone Project 1 for Bachelor of Science in Data Science</li> <li>• DSCI 4663: Capstone Project 2 for Bachelor of Science in Data Science</li> </ul>	6
	Total	30

### Psychoinformatics

Category	Courses	Hours
Fundamental Discipline Courses	<ul style="list-style-type: none"> <li>• PSY 1021 Careers in Psychology</li> <li>• PSY 3104 Introductory Psychological Stats</li> <li>• PSY 3314 Experimental Psychology</li> </ul>	9
Core Concentration Courses	<p>Choose 9 hours from the following 3-hour courses:</p> <ul style="list-style-type: none"> <li>• PSY 3343 Psychology of Learning</li> <li>• PSY 3623 Social Psychology</li> <li>• PSY 3713 Cognitive Psychology</li> <li>• PSY 3803 Intro to Developmental Psych</li> <li>• PSY 4403 Biological Psychology</li> </ul> <p>Choose 6 hours from among any of the 4000 level Psychology courses.</p>	15
Capstone	<ul style="list-style-type: none"> <li>• PSY 4000 Directed Individual Study in Psychology</li> </ul> <p>Students must perform research in a laboratory and present their capstone project at the Undergraduate Research Symposium.</p>	6
	Total	30

### Statistical Modeling

Category	Courses	Hours
Core Concentration Courses	<p>Complete 24 hours from the following 3-hour courses:</p> <ul style="list-style-type: none"> <li>• MA 2923 Intro. to Modern Scientific Computing</li> </ul>	24

	<ul style="list-style-type: none"> <li>• MA 4183 Math. Found. of Machine Learning</li> <li>• MA 4133 Discrete Mathematics</li> <li>• MA 4143 Graph Theory</li> <li>• ST 4213 Nonparametric</li> <li>• ST 4313 Intro to Spatial Statistics</li> <li>• ST 4543 Intro to Mathematical Statistics I</li> <li>• ST 4243 Data Analysis I</li> </ul>	
Capstone	Students will Register for the Following: <ul style="list-style-type: none"> <li>• DSCI 4553: Capstone Project 1 for Bachelor of Science in Data Science</li> <li>• DSCI 4663: Capstone Project 2 for Bachelor of Science in Data Science</li> </ul>	6
	Total	30

### Computational Intelligence

Category	Courses	Hours
Core Concentration Courses	<ul style="list-style-type: none"> <li>• CSE 2213 Methods &amp; Tools in Software Development</li> <li>• CSE 4163 Designing Parallel Algorithms</li> <li>• CSE 4683 Machine Learning and Soft Computing</li> <li>• CSE 4833 Introduction to Algorithms</li> <li>• CSE 4643 AI Robotics</li> <li>• CSE 4623 Computational Biology</li> <li>• CSE 4653 Cognitive Science</li> <li>• CSE 4293 Artificial Intelligence for Cybersecurity</li> </ul>	24
Capstone	<ul style="list-style-type: none"> <li>• DSCI 4553: Capstone Project 1 for Bachelor of Science in Data Science</li> <li>• DSCI 4663: Capstone Project 2 for Bachelor of Science in Data Science</li> </ul>	6
	Total	30

### Geoinformatics

Category	Courses	Hours
Fundamental Discipline Courses	Required courses (9 hours) <ul style="list-style-type: none"> <li>• GR 4303 Principles of GIS<sup>2</sup></li> <li>• Choose one of the following:             <ul style="list-style-type: none"> <li>○ GR 4333 Remote Sensing of the Physical Environment<sup>2</sup></li> <li>○ GR 4783 Satellite Meteorology</li> <li>○ GR 4883 Radar Meteorology</li> </ul> </li> <li>• GR 4633 Statistical Climatology</li> </ul>	9
Core Concentration Courses	Elective courses (15 hours – choose 5 from the following) <ul style="list-style-type: none"> <li>• GR 4733 Synoptic Meteorology</li> <li>• GR 4643 Physical Meteorology and Climatology I</li> <li>• GR 4693 Physical Meteorology and Climatology II</li> <li>• GR 4613 Applied Climatology</li> <li>• GR 4783 Satellite Meteorology<sup>1</sup></li> <li>• GR 4883 Radar Meteorology<sup>1</sup></li> <li>• GR 4553 Computer Methods in Meteorology</li> </ul>	15

	<ul style="list-style-type: none"> <li>• GR 4313 Advanced GIS<sup>2</sup></li> <li>• GR 4323 Cartographic Sciences<sup>2</sup></li> <li>• GR 4333 Remote Sensing of the Physical Environment<sup>1,2</sup></li> <li>• GR 4343 Advanced Remote Sensing<sup>2</sup></li> <li>• GR 4363 GIS Programming<sup>2</sup></li> <li>• GR 4123 Urban Geography</li> <li>• GG 3613 Water Resources</li> <li>• GG 4233 Applied Geophysics</li> <li>• GG 4413 Structural Geology</li> <li>• GG 4503 Geomorphology</li> <li>• GG 4523 Coastal Environments</li> <li>• GG 4543 Community Engagement in Geosciences</li> <li>• GG 4613 Physical Hydrogeology</li> </ul> <p><sup>1</sup> Can be used as remaining hours if not already used for the required concentration  <sup>2</sup> Counts towards the Geospatial and Remote Sensing Minor</p>	
Capstone	<p>Students will Register for the Following:</p> <ul style="list-style-type: none"> <li>• DSCI 4553: Capstone Project 1 for Bachelor of Science in Data Science</li> <li>• DSCI 4663: Capstone Project 2 for Bachelor of Science in Data Science</li> </ul>	6
	Total	30

#### STUDENT LEARNING OUTCOMES AND ASSESSMENT

1. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
3. Communicate effectively in a variety of professional contexts.
4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
6. Apply theory, techniques, and tools throughout the data science lifecycle and employ the resulting knowledge to satisfy stakeholders' needs.
7. Understand how to create a culture and leadership environment for innovation that puts the practice of data science at the core source of the economic and cultural vitality of an organization to ensure success in the process of digital transformation.
8. Understand, construct, evaluate, and choose data-enabled predictive models using state-of-the-art artificial intelligence, machine learning, statistical modeling, and model evaluation methods.

Assessment will be realized through the Institutional Effectiveness report process. External reviewers will also be identified to conduct periodic self-studies and, when possible, to seek accreditation through the ABET Computing Accrediting Commission or other accreditation bodies relevant to establishing the overall quality of the program.

SUPPORT – Letters of support from the Senior Advisor for Data Science Development and 9 Deans  
PROPOSED 4-LETTER ABBRIAVIATION DSCI  
EFFECTIVE DATE Fall 2022  
CIP NIMBER 30.7001



## Appendix 8: New Degree Program Proposal

**Institution: Mississippi State University**

**Date of Implementation:**

**Incremental, Five-Year Cost of Implementation: \$ 3,459,300**

**Incremental, Five-Year Per Student Cost of Implementation: \$ 8,437**

Fall 2022

**Will it attract new students to the university?**

Yes  No

**Potential Five-Year, New Revenue:**

\$ 8,283,930

**Potential New, Five-Year Revenue Per Student:**

\$ 20,204

**Program Title as will Appear on Academic Program Inventory, Diploma, and Transcript:**

Bachelor of Science with a Major in Data Science

**Six-Digit CIP Code:**

30.7001

**Name of Degree(s) to be Awarded:**

Bachelor of Science with a Major in Data Science

**Total Credit Hour Requirements to earn the degree:**

123

**List any institutions within the state offering similar programs:**

No other university in Mississippi is currently offering a Bachelor of Science in Data Science. Furthermore, no institution is offering a B.S. in Data Science that covers the five major disciplines within the field of data science as core program: (1) Computer Science, (2) Mathematics and Statistics, (3) Management Information Systems, (4) Communication, and (5) Management and Leadership. Mississippi State University would be the first institution to offer such a major. Mississippi State University currently offers a Master of Science in Data Science, an interdisciplinary program.

University of Mississippi has an undergraduate Computer Science emphasis area in Data Science. Jackson State University currently offers a post-baccalaureate certificate in Data Analytics.

**Responsible Academic Unit(s):**

Division of Academic Affairs

Office of the Provost and Executive Vice President

**Institutional Contact:** Peter L. Ryan / Mimmo Parisi

**Phone:** 662-325-3742

**Email:** [ryan@provost.msstate.edu](mailto:ryan@provost.msstate.edu) /

**Check one of the boxes below related to SACSCOC Substantive Changes.**



**Proposed Program is Not a Substantive Change**



**Proposed Program is a Substantive Change**

**Number of Students Expected to Enroll in First Five Years:**

Year One	50
Year Two	80
Year Three	80
Year Four	100
Year Five	100
<b>Total</b>	<b>410</b>

**Number of Graduates Expected in First Five Years:**

Year One	0
Year Two	5
Year Three	18
Year Four	56
Year Five	60
<b>Total</b>	<b>139</b>

**Program Summary:**

Students pursuing the Bachelor of Science in Data Science at Mississippi State will have the opportunity to develop the knowledge and skills necessary to meet the growing demand for data science experts in the context of the ongoing digital transformation. Digital transformation is the process by which the physical world blends with or gets replaced by the digital world. An organization achieves digital transformation when Artificial Intelligence (AI) becomes an integral part of its operations. Yet AI cannot work without data.

In a digitally transformed world, data are the new oil, the necessary resource to power Artificial Intelligence (AI) and to extract new knowledge to advance human progress. Data and AI are changing the way we live, work, and learn. Data and AI are also broadly impacting public and private sector activity, from health and education to industrial and service sectors. As organizations and businesses turn to data solutions and AI strategies, they are also increasingly creating new positions relating to the practice of data science. In response to digital transformation, data science is a new emerging field that explores and advances methods, systems, and processes to:

- Represent the world as data objects;
- Extract insights about the world from these data objects and turn these insights into discoveries, decisions, and actions; and
- Create smart systems to perform tasks that have historically required human cognition and human decision-making abilities.

The Mississippi State Bachelor of Science in Data Science is an interdisciplinary program that draws upon disciplines from multiple colleges. It is a 123-hour Inter-College Program designed to include three general areas of coursework: general education, program core, and applications of the data science fundamentals in specific body of knowledge such as health informatic, geoinformatics, computational intelligence and cybersecurity, marketing, management information systems, statistical modeling, social science analytics, psych informatics, architectural design and built environment, and smart agriculture. The overall curriculum is designed to provide students with an ideal educational experience necessary to become effective professional data science experts. Under the proposed undergraduate curriculum, general education coursework will help prospect data science students develop intellectual curiosity, critical thinking, and ethical and aesthetic awareness. The coursework for the core program will provide students with the opportunity to build a strong foundation in the key fields of data science which include computer science, mathematics and statistics, management information systems, communication, management / leadership, design, and ethics. And the course sequences for several distinct areas of academic concentration will provide students with the opportunity to become data science experts in an area such as:

1. Visualization and Visual Analytics for Built Environment: College of Architecture, Art, and Design
2. Computational Agriculture and Natural Resources: College of Agriculture and Life Sciences and the College of Forest Resources
3. Business Information Systems: College of Business
4. Marketing and Supply Chain Analysis: College of Business
5. Social Data Analysis: College of Arts and Sciences
6. Psycho-informatics: College of Arts and Sciences
7. Statistical Modeling: College of Arts and Sciences
8. Computational Intelligence: Bagley College of Engineering
9. Geoinformatics: College of Arts and Sciences

Mississippi State University is seeking approval to offer this new degree program through both the in-person and the online (distance education) instructional modalities.

\_\_\_\_\_  
**Chief Academic Officer Signature**

\_\_\_\_\_  
**Date**

\_\_\_\_\_  
**Institutional Executive Officer Signature**

\_\_\_\_\_  
**Date**

**Institution: Mississippi State University**

1. **Describe how the degree program will be administered including the name and title of person(s) who will be responsible for curriculum development and ongoing program review.**

The program will be administered through the Office of the Provost and Executive Vice President, by a program director, a program coordinator, and a student program advisor. An advisor from each college sponsoring an area of concentration will also be identified to ensure students formulate a sequence that considers prerequisites and necessary sequences. The program will be governed under the general direction of a university-wide Program Advisory Committee of the Faculty (hereafter, Advisory committee) with the Program Director as a member of the committee. The committee's general responsibility will be to provide oversight for the overall management of the program and to provide continuous review of the program to keep it current and relevant. The committee will be comprised of full-time or tenure-track faculty from each of the colleges on campus. Members will serve a three-year term. The committee will elect its own chair for a three-year term. Each college will develop a College Program Committee (hereafter, College committee) to recruit and advise their students on the concentrations and other course requirements for the degree. The College committee will also be responsible for programmatic decisions about the concentration area(s) and to maintain and keep the curriculum of their concentration area(s) current and relevant.

2. **Describe the educational objectives of the degree program including the specific objectives of any concentrations, emphases, options, specializations, tracks, etc.**

The educational objectives of this new degree are:

- Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.

- Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
- Communicate effectively in a variety of professional contexts.
- Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
- Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
- Apply theory, techniques, and tools throughout the data science lifecycle and employ the resulting knowledge to satisfy stakeholders' needs.
- Understand how to create a culture and leadership environment for innovation that puts the practice of data science at the core source of the economic and cultural vitality of an organization to ensure success in the process of digital transformation.
- Understand, construct, evaluate, and choose data-enabled predictive models using state-of-the-art artificial intelligence, machine learning, statistical modeling, and model evaluation methods.

**3. Describe any special admission requirements for the degree program including any articulation agreements that have been negotiated or planned.**

**New Freshmen Admission**

For regular admission to the Bachelor of Science in Data Science program as a freshman, students must be admitted to MSU and meet any one of the following criteria:

- Have a composite score greater than or equal to 23 on the ACT or 1130 on the SAT
- Have a composite score of 20, 21, or 22 on the ACT or between 1030 and 1120 on the SAT with a high school GPA of 3.0 or greater on academic core courses listed above
- Have an ACT or SAT score with a high school GPA of 3.5 or greater on academic core courses listed above.

New freshmen applicants who do not meet these requirements, are otherwise admitted to MSU, and want to pursue the BS in Data Science, should join the undeclared Data Science concentration. All students who are classified as Undeclared but plan to eventually move into the BS in Data Science must enroll in an appropriate math course each semester they are enrolled in this major.

To be successful in data science, a student must develop good math skills through courses in calculus, linear algebra, statistics, and other math topics. In data science, the first math course that applies to the degree is calculus. Taking calculus requires that a student have an adequate preparation in algebra, geometry, and trigonometry.

To provide students with the best possible opportunity for success in calculus, the Department of Mathematics and Statistics has established the following guidelines for placing students in math courses:

- MA 1713 Calculus I - have an ACT math sub-score of 26 or higher or have grades of C or better in MA 1313 College Algebra and MA 1323 Trigonometry or a C or better in MA 1453 Precalculus with Graphing Calculators.
- MA 1453 Precalculus with Graphing Calculators - have an ACT math sub-score of 24 or higher, or have a grade of C or better in MA 1313 College Algebra
- MA 1313 College Algebra - have an ACT math sub-score of 19 or higher

Students who are not prepared for Calculus I will be required to first complete Precalculus or a sequence of College Algebra and Trigonometry before taking calculus.

**Internal Transfers**

Undeclared and other students at Mississippi State University may be admitted into the BS in Data Science if they satisfy any one of the following criteria:

- Meet Data Science new freshmen requirements listed above.
- Have completed at least 30 hours with a cumulative GPA greater than or equal to 2.0 and passed Calculus I (MA 1713) with a grade of C or better.

**External Transfers**

Students may transfer from other colleges or universities into the MSU Data Science program if they meet all requirements to transfer to MSU and satisfy any one of the following criteria:

- Meet Data Science new freshmen admission standards listed above.
- Have completed at least 30 hours with a cumulative GPA greater than or equal to 2.0 and passed a course equivalent to Calculus I (MA 1713) with a grade of C or better.

Transfer students not meeting these requirements should join the undeclared Data Science concentration.

**4. Describe the professional accreditation that will be sought for this degree program. If a SACSCOC visit for substantive change will be necessary, please note.**

Data science draws on knowledge, skills and abilities from computer science, mathematics and statistics, management information systems, communication, management and leadership, and ethics all applied in the context of domains that make use of data. The interdisciplinary nature of data science calls for uniting traditionally separate disciplines into a coherent approach that produces effective data science experts. Recently, we have witnessed a growing interest in developing undergraduate data science programs around the country. Thus far, only a few undergraduate programs have been created. Currently, there is a set of proposed program standards by the Accreditation Board for Engineering and Technology (ABET) that is still under development. Under the ABET proposed program standards, the data science curriculum must provide graduates with the knowledge and skills to be able to apply theory, techniques, and tools throughout the data science lifecycle and to employ the results to satisfy stakeholders' needs.

According to ABET's draft standard, the curriculum must include:

1. Fundamental data science lifecycle topics:

- a) Data acquisition and representativeness
- b) Data management
- c) Data preparation and integration
- d) Data analysis
- e) Model development and deployment
- f) Visualization and communication of the knowledge obtained from the data

2. Concepts that span and are applied to the data science lifecycle:

- a) Data ethics including legitimate use and algorithmic fairness
- b) Governance including privacy, security, and stewardship
- c) Statistical and mathematical topics including inference, modeling, linear algebra, probability, and optimization
- d) Computing including data structures and algorithms

3. Advanced data science coursework that provides depth.

4. Coverage of at least one application area that provides context for data science activities.

5. A comprehensive project or experience that incorporates an application area and requires integration and application of knowledge and skills acquired in earlier course work.

The proposed data science program is designed to meet the draft standards for accreditation promulgated by the Computing Accreditation Commission of ABET, <http://www.abet.org>. Program accreditation will be sought as soon as final ABET standards are available, and accreditation is possible.

**5. Describe the curriculum for this degree program including the recommended course of study (appending course descriptions for all courses) and any special requirements such as clinical, field experience, community service, internships, practicum, a thesis, etc.**

All students will be required to complete 123 hours of coursework that includes: general education (30 Hours), program core (63 Hours), and course sequences from one of the available concentration areas (30 Hours).

**General Education (30 Hours)**

The general education component of the Bachelor of Science in Data Science follows the IHL and university general guidelines for a standard Bachelor of Science degree.

Category	Course	Hours
English	<ul style="list-style-type: none"> <li>• EN 1103 English Comp I or</li> <li>• EN 1104 Expanded English Comp I</li> </ul>	3
English	<ul style="list-style-type: none"> <li>• EN 1113 English Comp II or</li> <li>• EN 1173 Accelerated Comp II</li> </ul>	3
Fine Arts	<p>1 Course from the following:</p> <ul style="list-style-type: none"> <li>• AAS 1103 African American Music</li> <li>• ARC 1013 Architectural Appreciation</li> <li>• ART 1013 Art History I</li> <li>• ART 1023 Art History II</li> <li>• ART 1113 Art Appreciation</li> <li>• CO 1503 Introduction to the Theatre</li> <li>• HON 3173 Honors Seminar in Fine Arts</li> <li>• ID 3643 History of Interiors I</li> <li>• LA 1803 Landscape Architecture Appreciation</li> </ul>	3

	<ul style="list-style-type: none"> <li>• MU 1103 African American Music</li> <li>• MU 1113 History and Appreciation of Music</li> <li>• MU 1123 History and Appreciation of American Music</li> <li>• MU 1133 The History of Rock and Roll</li> <li>• MU 1143 The History of Jazz</li> <li>• MU 1163 Introduction to Music in Film</li> <li>• MU 1173 Music of the Beatles</li> <li>• MU 2173 Women in Music</li> <li>• MU 3013 Survey of Western Music History I</li> <li>• PE 1323 History and Appreciation of Dance</li> <li>• PSS 2343 Floral Design</li> <li>• TKI 2413 History and Appreciation of the Artcrafts</li> </ul>	
Natural Sciences	<p>2 Lab-Based Courses from the Following:</p> <ul style="list-style-type: none"> <li>• AN 1344 Introduction to Biological Anthropology</li> <li>• BIO 1004 Anatomy and Physiology</li> <li>• BIO 1134 Biology I</li> <li>• BIO 1144 Biology II</li> <li>• BIO 3304 General Microbiology</li> <li>• CH 1213 Chemistry I</li> <li>• CH 1223 Chemistry II</li> <li>• GG 1113 Survey of Earth Sciences I + GG 1111 Lab</li> <li>• GG 1123 Survey of Earth Sciences II + GG 1121 Lab</li> <li>• PO 3103 / GNS 3103 / GNS 3103 Genetics I</li> <li>• GR 1114 Elements of Physical Geography</li> <li>• GR 1604 Weather and Climate</li> <li>• PH 1013 Physical Science Survey 1 + PH 1011 Lab</li> <li>• PH 1023 Physical Science Survey 2 + PH 1023 Lab</li> <li>• PH 1113 General Physics I</li> <li>• PH 1123 General Physics II</li> <li>• PH 1133 General Physics III</li> <li>• PH 2223 Physics II</li> <li>• PH 2233 Physics III</li> <li>• PSS 1313 Plant Science</li> </ul>	6
Mathematics	<ul style="list-style-type: none"> <li>• MA 1713 Calculus I (required)</li> </ul>	3
Humanities	<ul style="list-style-type: none"> <li>• PHI 1113 Intro to Logic (required)</li> </ul>	3
Humanities	<p>1 Course from the following:</p> <ul style="list-style-type: none"> <li>• AAS 1063 Introduction to African American Studies</li> <li>• AAS 2363 Introduction to African American Literature</li> <li>• AAS 3013 African American History to 1865</li> <li>• AAS 3023 African American History since 1865</li> <li>• ARC 2313 History of Architecture I</li> <li>• ARC 3313 History of Architecture II</li> <li>• ARC 3323 History of Architecture III</li> <li>• BCS 2013 Construction and Culture</li> <li>• EN 2203 Introduction to Literature</li> <li>• EN 2213 English Literature Before 1800</li> <li>• EN 2223 English Literature After 1800</li> <li>• EN 2243 American Literature Before 1865</li> <li>• EN 2253 American Literature After 1865</li> <li>• EN 2273 World Literature Before 1600</li> <li>• EN 2283 World Literature After 1600</li> <li>• FL 1113 Language I 1</li> <li>• FL 1123 Language II 1</li> <li>• FL 2133 Language III 1</li> <li>• FL 2143 Language IV 1</li> <li>• HI 1003 History of Science in Six Ideas</li> <li>• HI 1013 History of Technology in Six Objects</li> <li>• HI 1063 Early U.S. History</li> <li>• HI 1073 Modern U.S. History</li> <li>• HI 1163 World History Before 1500</li> <li>• HI 1173 World History Since 1500</li> </ul>	3

	<ul style="list-style-type: none"> <li>• HI 1213 Early Western World</li> <li>• HI 1223 Modern Western World</li> <li>• HI 1313 East Asian Civilizations to 1300</li> <li>• HI 1323 East Asian Civilizations since 1300</li> <li>• HI 4683 Europe: The First World War to Hitler</li> <li>• HON 1163 The Quest Begins</li> <li>• HON 3183 Honors Seminar in the Humanities</li> <li>• PHI 1103 Introduction to Philosophy</li> <li>• PHI 1113 Introduction to Logic</li> <li>• PHI 3023 History of Western Philosophy I</li> <li>• PHI 3033 History of Western Philosophy II</li> <li>• PHI 3153 Aesthetics</li> <li>• REL 1103 Introduction to Religion</li> <li>• REL 3213 World Religions I</li> <li>• REL 3223 World Religions II</li> </ul>	
Social / Behavioral Science	<ul style="list-style-type: none"> <li>• DSCI 2013 Data Science Literacy (Required)</li> </ul>	3
Social / Behavioral Science	<p>1 Course from the Following:</p> <ul style="list-style-type: none"> <li>• ADS 1013 Animal Agriculture &amp; Society: Food for Thought</li> <li>• AEC 2713 Introduction to Food and Resource Economics</li> <li>• AN 1103 Introduction to Anthropology</li> <li>• AN 1143 Introduction to Cultural Anthropology</li> <li>• AN 1543 Introduction to Archaeology</li> <li>• AN 2403 Introduction to the Study of Language</li> <li>• CO 1223 Introduction to Communication Theory</li> <li>• CO 1403 Introduction to the Mass Media</li> <li>• EC 1033 Economics of Social Issues</li> <li>• EC 2113 Principles of Macroeconomics</li> <li>• EC 2123 Principles of Microeconomics</li> <li>• EN 2403 Introduction to the Study of Language</li> <li>• EPY 2513 Human Growth and Development</li> <li>• EPY 3503 Principles of Educational Psychology</li> <li>• EPY 3543 Psychology of Adolescence</li> <li>• FO 4113 Forest Resource Economics</li> <li>• GR 1123 Introduction to World Geography</li> <li>• GR 2013 Human Geography</li> <li>• HON 1173 The West and the Wider World</li> <li>• HON 3143 Honors Seminar in Social Science</li> <li>• HDFS 1813 Individual and Family Development through the Lifespan</li> <li>• PO 1013 Animal Agriculture &amp; Society: Food for Thought</li> <li>• PS 1113 American Government</li> <li>• PS 1313 Introduction to International Relations</li> <li>• PS 1513 Comparative Government</li> <li>• PSY 1013 General Psychology</li> <li>• PSY 3073 Psychology of Interpersonal Relations</li> <li>• SO 1003 Introduction to Sociology</li> <li>• SO 1103 Contemporary Social Problems</li> <li>• SO 1203 Sociology of Families</li> </ul>	3
	Total	30

Note: general education requirements for oral communication and Junior / Senior writing are fulfilled via CO 3213 and CO 3223 (See Communications section below).

### **Data Science Core Coursework (63 Hours)**

#### **Mathematics and Statistics**

The Mathematics and Statistics components of the degree will ensure the student has a firm grasp of mathematical concepts underlying the practice of data science, including matrices, calculus, discrete mathematics, statistics, and statistical inference. Depending upon the concentration, students may also take additional mathematics or statistics courses that will count toward the concentration requirements.

Course Code	Title	Hours
MA / ST 3123	Introduction to Statistical Inference Two hours laboratory. Basic concepts and methods of statistics, including descriptive statistics, probability, random variables, sampling distribution, estimation, hypothesis testing, introduction to analysis of variance, simple linear regression.	3
MA 1723	Calculus II Anti-differentiation; the definite integral; applications of the definite integral; integration of transcendental functions; other techniques of integration.	3
MA 2713	Calculus III Three hours lecture. Parametric and Polar Equations; infinite series; introduction to vectors; vector functions.	3
MA 3113	Introduction to Linear Algebra Linear transformations and matrices; eigen values and similarity transformations; linear functionals, bilinear and quadratic forms; orthogonal and unitary transformations; normal matrices; applications of linear algebra.	3
MA/ST 4523	Introduction to Probability Basic concepts of probability, conditional probability, independence, random variables, discrete and continuous probability distributions, moment generating function, moments, special distributions, central limit theorem.	3
	Total	15

### Computer Science and Engineering

The Bachelor of Science in Data Science provides a student with a computer science sequence that covers these essential topics: techniques, skills, and tools necessary for computing practice; principles and practices for secure computing; and local and global impacts of computing solutions on individuals, organizations, and society. Depending upon the concentration, students may also take additional courses in Computer Science and Engineering that will count toward the concentration requirements.

Course Code	Title	Hours
CSE 1284	Introduction to Computer Programming Introductory problem solving and computer programming using object-oriented techniques. Theoretical and practical aspects of programming and problem solving.	4
CSE 1384	Intermediate Computer Programming Object-oriented problem solving, design, and programming. Introduction to data structures, algorithm design and complexity.	4
CSE 2813	Discrete Structures Concepts of algorithms, induction, recursion, proofs, topics from logic, set theory, combinatorics, graph theory fundamental to study of computer science.	3
CSE 2383	Data Structures and Analysis of Algorithms Non-linear data structures and their associated algorithms. Trees, graphs, hash tables, relational data model, file organization. Advanced software design and development.	3
CSE 4503	Database Management Systems Modern database models; basic database management concepts; query languages; database design through normalization; advanced database models; extensive development experience in a team environment.	3
CSE 4633	Artificial Intelligence Study of the computer in context with human thought processes. Heuristic programming; search programming; search strategies; knowledge representation; natural language understanding; perception; learning	3
CSE 3763	Legal and Ethical Issues in Computing Exploration of how and why information security laws and policies are developed and managed. Students learn about existing state and federal laws and explore social and ethical issues related to information technology and computing in society.	3
	Total	23

### Business Information Systems

Data science professionals often create or use data from systems designed to manage case or business data. Depending upon the concentration, students may also take additional courses in Business or Management Information Systems courses that will count toward the concentration requirements.

Course Code	Title	Hours
BIS 3233	Management Information Systems A survey of the components, functions, and processes of Information Systems as they relate to managing modern organization for increased efficiency and competitiveness.	3
	Total	3

### Communications

Data science students will learn to communicate clearly about data and will gain a mature understanding of scientific or logical methodology. Depending upon the concentration, students may also take additional courses in communication that will count toward the concentration requirements.

Course Code	Title	Hours
CO 3213	Small Group Communication Three hours lecture. A study of the problems and techniques of participation in and leadership of small groups.	3
CO 3223	Communication and Media Research Methods Three hours lecture. An introduction to methods used to study communication problems and processes.	3
	Total	6

### Data Science Proper

Students will learn about data acquisition and the ethical and legal issues in data science. They will also, through labs, gain practical skills in applying data science concepts and using cloud and high-performance computing resources. Depending upon the concentration, students may also take additional courses in data science that will count toward the concentration requirements.

Course Code	Title	Hours
DSCI 3013	Fundamentals of Data Acquisition Exploration of various methods of data acquisition and management. Also includes topics in data privacy, governance, and stewardship.	3
DSCI 2012	Data Science Lab 1 - Data Wrangling Working with common data files and formats. Cleaning and formatting messy and complex data sets for easy access and analysis. Converting and mapping data from one raw form into another format to allow for more convenient consumption and organization of the data.	2
DSCI 3012	Data Science Lab 2 – Description, Analysis, and Inference Hands-on work with techniques such as regression analysis and other statistical inference techniques.	2
DSCI 3022	Data Science Lab 3 – Data Visualization Use of tools and programming libraries to visualize data using common approaches to the visual display of numerical information.	2
DSCI 3032	Data Science Lab 4 - Artificial Intelligence Use of Python with artificial intelligence and machine-learning libraries to train models in areas such as natural language processing, computer vision, and classification.	2
DSCI 2022	Data Science Lab 5 - Cloud, Quantum, and High-Performance Computing Exposure to cloud-based computing platforms that support use of GPU, TPU, Quantum, or other high-performance computing tasks for big data analysis tasks.	2
DSCI 4013	Data Visualization Course providing theoretical foundation for information visualization. Deals with external representation and interactive manipulation of information, data or artifacts using digital tools to enhance communication, analytical reasoning, and decision-making.	3
	Total	16



### **Areas of Concentration (30 Hours)**

Each area of concentration combines fundamental, field-specific content, concentration electives designed to apply data science to the field, and a six-hour practicum/capstone project. On their third year, students will have the opportunity to select a concentration area from the several available areas offered by the different colleges on campus.

#### **Visualization and Visual Analytics for Built Environment**

College: College of Architecture, Art, and Design

The design and construction process for the built environment is rapidly transforming, driven by two primary forces. Architects and designers are increasingly adopting Building Information Modeling (BIM) techniques that allow more sustainable, accurate, and efficient design, planning, evaluation, and construction of the built environment. Rapid integration of IoT sensors and intelligent building systems that track every aspect of building performance complements the digital revolution in the design process. However, the data visualization and analytics efforts have significantly lagged behind data capture efforts by integrating IoT sensors in smart buildings. This gap presents an opportunity for a new class of professionals at the intersection of data science and design visualization. The industry needs new professionals who can bring together computational statistics and data analytic skills with visualization skills to inform the development of new workflows and strategies for the design and construction industries. Courses in this concentration train aim to fill this gap by preparing students in three complementary areas:

- Provide a foundation in basic principles of design and digital representation drawing from traditional art and design disciplines
- Develop advanced design visualization skills using state-of-the-art computer-aided design (CAD) and building information modeling (BIM) software tools used in the architecture, engineering, and construction industries
- Develop an understanding of advanced building systems and building performance simulations and evaluations

The fundamental discipline courses in this concentration thus introduce visualization and analytics techniques that support the entire building project lifecycle from design development, construction, and operation to increase efficiency and enhance performance. The two data science capstone projects for this concentration provide opportunities to engage in real-world problem-based learning by bringing together foundational data science skills with visualization and analytic skills developed as part of the concentration.

Category	Courses	Hours
Fundamental Discipline Courses	Complete <u>EIGHT</u> 3-credit courses out of the following <u>TEN</u> : <ul style="list-style-type: none"> <li>• ART 1123 Design I (2D)</li> <li>• ART 2803 Intro to Comp. Art</li> <li>• ART 2813 Intermediate Computing for Design</li> <li>• ART 4813 Multimedia I</li> <li>• BCS 2313 Virtual Design &amp; Construction</li> <li>• ID 3603 Digital Design for Interiors</li> <li>• ID 3363 3D CAD Modeling</li> <li>• ARC 2713 Passive Bldg. Systems</li> <li>• ARC 3723 Active Bldg. Systems</li> <li>• ARC 4633 Architecture and Virtual Spaces</li> </ul>	24
Capstone	Students will Register for the Following: <ul style="list-style-type: none"> <li>• DSCI 4553: Capstone Project 1 for Bachelor of Science in Data Science</li> <li>• DSCI 4663: Capstone Project 2 for Bachelor of Science in Data Science</li> </ul>	6
	<b>Total</b>	<b>30</b>

#### **Computational Agriculture and Natural Resources**

College: College of Agriculture and Life Sciences and the College of Forest Resources

The use of data science in the fields of agriculture and natural resources has increased substantially in recent years. The Computational Agriculture and Natural Resources (CANR) concentration trains students interested in data-driven careers in agriculture and natural resources through subject matter and applied data science coursework. Students who complete the CANR concentration will be equipped for careers as data scientists in agricultural production, agricultural technology, agricultural finance, natural resource management, wildlife and fisheries science, plant science, and other related fields.

Category	Courses	Hours
Fundamental Discipline Courses	Choose 1 Course from the Following: <ul style="list-style-type: none"> <li>• AEC 2713 Introduction to Food and Resource Economics</li> <li>• ABE 1863 Engineering Technology in Agriculture</li> <li>• BCH 4013 Principles of Biochemistry</li> </ul>	6

	<ul style="list-style-type: none"> <li>• PSS 1313 Plant Science</li> </ul> <p>Choose 1 Course from the Following:</p> <ul style="list-style-type: none"> <li>• SBP 1103 Introduction to Sustainable Bioproducts</li> <li>• WFA 3133 Applied Ecology</li> <li>• FO 4123 Forest Ecology</li> </ul>	
Core Concentration Courses	<p>Choose 6 Credit Hours from the Following:</p> <p>CALS:</p> <ul style="list-style-type: none"> <li>• EC 2113 Principles of Macroeconomics</li> <li>• EC 3123 Intermediate Microeconomics</li> <li>• AEC 2223 Introduction to Sustainability Economics</li> <li>• AEC 3133 Introductory Agribusiness Management</li> <li>• AEC 3233 Introduction to Environmental Economics and Policy</li> <li>• AEC 4123 Financial and Commodity Futures Marketing</li> <li>• ABE 2173 Principles of Agricultural and Off-Road Machines</li> <li>• ABE 2543 Precision Agriculture I</li> <li>• ABE 4543 Precision Agriculture II</li> <li>• BCH 3102 Essential Biochemical Concepts and Analysis</li> <li>• BCH 4414 Protein Methods</li> </ul> <p>CFR:</p> <ul style="list-style-type: none"> <li>• SBP 2012 Intro to Bioproducts Industries</li> <li>• SBP 2123 Materials and Processing of Structure Bioproducts</li> <li>• WFA 4313 Fisheries Management</li> <li>• WFA 4613 Landscape Ecology</li> <li>• FO 2213 Forest Measurements</li> <li>• FO 2443 Essentials of Biotechnology</li> <li>• FO 4113 Forest Resource Economics</li> <li>• FO 4123 Forest Ecology</li> </ul>	6
Applied Courses	<p>Choose 12 Credit Hours from the Following:</p> <p>CALS:</p> <ul style="list-style-type: none"> <li>• AEC 4133 Analysis of Food Markets and Prices</li> <li>• AEC 4223 Applied Quantitative Analysis in Agricultural Economics</li> <li>• AEC 4363 Economics of Precision Agriculture</li> <li>• AEC 4413 Public Problems of Agriculture</li> <li>• AEC 4733 Econometric Analysis in Agricultural Economics</li> <li>• ABE 2873 Land Surveying</li> <li>• ABE 3513 The Global Positional System and Geographic Information Systems in Agriculture and Engineering</li> <li>• ABE 4163 Machine Management Agro-Ecosystems</li> <li>• ABE 4263 Soil and Water Management</li> <li>• ABE 4463 Introduction to Imaging in Biological Systems</li> <li>• ABE 4483 Introduction to Remote Sensing Technologies</li> <li>• BCH 4803 Integrative Protein Evolution</li> <li>• PSS 4483 Introduction to Remote Sensing Technologies</li> </ul> <p>CFR:</p> <ul style="list-style-type: none"> <li>• SBP 4013 Wood Anatomy</li> <li>• SBP 4253 Quantitative Methods in SBP</li> <li>• WFA 4123 Wildlife and Fisheries Biometrics</li> <li>• WFA 4243 Wildlife Techniques</li> <li>• WFA 4253 Application of Spatial Technologies to Wildlife Fisheries Management</li> <li>• FO 3015 Forest Description and Analysis</li> <li>• FO 4213 Forest Biometrics</li> <li>• FO 4313 Spatial Techniques in Natural Resources Management</li> <li>• FO 4453 Remote Sensing Applications</li> <li>• FO 4473 GIS for Natural Resource Management</li> </ul>	12
Capstone	<p>Students will Register for the Following:</p> <ul style="list-style-type: none"> <li>• DSCI 4553: Capstone Project 1 for Bachelor of Science in Data Science</li> <li>• DSCI 4663: Capstone Project 2 for Bachelor of Science in Data Science</li> </ul>	6

	Total	<b>30</b>
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### Business Information Systems

College: College of Business

Modern enterprise management presents complex challenges of identifying actionable knowledge derived from the emerging flood of new data captured by an exploding number of online processes and connected sensors and devices. Companies are redesigning their organizational structures and processes to leverage this new capability – the concentration in BIS will prepare students to play a leading role in this emerging digital transformation and help companies compete in the increasingly connected environment. Students will combine their in-depth understanding of business processes with the ability to apply data science techniques to analyze business data, enabling them to aid strategic decision making. The concentration in BIS prepares students to solve business problems and identify business opportunities in the context of intelligent data analytics and digital transformation. Students will master these skills through learning exercises and real-world projects, engaging in projects to develop and implement a data-driven decision process or solution based on data mining, artificial intelligence, machine learning, and knowledge discovery of hidden relationships that can be exploited for new advances in business strategy. This experiential learning approach enables students to leverage their skillsets in a contextualized environment, complete with project management requirements, cost-benefit trade-offs, implementation obstacles (including financial, political, administrative, temporal, and legal barriers), team building and culture-building requirements, progress measurement methods, and complete life-cycle management of data science projects.

Category	Courses	Hours
Fundamental Discipline Courses	Students will choose three courses from the following: <ul style="list-style-type: none"> <li>• BL 2413 Legal Environment of Business</li> <li>• ACC 2013 Financial Accounting</li> <li>• ACC 2023 Managerial Accounting</li> <li>• EC 2113 Macro Economics</li> <li>• EC 2123 Macro Economics</li> <li>• FIN 3123 Financial Management</li> <li>• MGT 3113 Principles of Management</li> <li>• MKT 3013 Principles of Marketing</li> <li>• MKT 3323 International Logistics</li> </ul>	9
Core Concentration Courses	<ul style="list-style-type: none"> <li>• BQA 4423 Business Decision Analysis</li> <li>• BIS 4533 Decision Support Systems</li> <li>• BIS 4113 BIS Security Management</li> <li>• BIS 4753 Structured Systems Analysis and Design</li> </ul> <p>In addition, students will choose an elective from one 4000-level business course.</p>	15
Capstone	Students will Register for the Following: <ul style="list-style-type: none"> <li>• BIS 4763 BIS Senior Seminar (analytics project)</li> <li>• BQA 4413 Business Forecasting &amp; Predictive Analytics</li> </ul>	6
	Total	30

### Marketing and Supply Chain Analytics

Colleges: College of Business

Marketing and supply chain functions are increasingly driven by data. Tasks such as analyzing online social media content, planning advertising campaigns across multiple online channels, designing cutting edge products, and delivering products through complex global supply chains, all require cutting edge data analytics skills.

The concentration in Marketing and Supply Chain Analytics prepares students to solve data-driven business problems relating to marketing and supply chain management. Fundamental discipline courses expose students to important principles in business. Core concentration courses include upper-level courses focused on marketing and supply-chain analytics. There is a strong focus on practical project-driven learning in this concentration, with several classes offering the chance to working on projects for local companies and non-profit organizations.

Category	Courses	Hours
Fundamental Discipline Courses	Students will take the following 2 Courses: <ul style="list-style-type: none"> <li>• MKT 3013 Principles of Marketing</li> <li>• MKT 3323 International Logistics</li> </ul> <p>Students will choose two courses from the following:</p>	12

	<ul style="list-style-type: none"> <li>• BL 2413 Legal Environment of Business</li> <li>• ACC 2013 Financial Accounting</li> <li>• ACC 2023 Managerial Accounting</li> <li>• EC 2113 Macro Economics</li> <li>• EC 2123 Macro Economics</li> <li>• FIN 3123 Financial Management</li> <li>• MGT 3113 Principles of Management</li> </ul>	
Core Concentration Courses	<p>Students will choose four courses from the following list.</p> <ul style="list-style-type: none"> <li>• BQA 4423 Business Decision Analysis</li> <li>• BIS 4533 Decision Support Systems</li> <li>• MKT 4533 Marketing Research</li> <li>• MKT 4213 Internet Marketing</li> <li>• MKT 4033 International Transportation</li> <li>• MKT 4013 Procurement</li> <li>• MKT 4313 Physical Distribution Management</li> </ul>	12
Capstone	<p>Students will Register for the Following:</p> <ul style="list-style-type: none"> <li>• MKT 4333 International Supply Chain Management</li> <li>• BQA 4413 Business Forecasting &amp; Predictive Analytics</li> </ul>	6
Total		30

### Social Data Analytics

College: College of Arts and Sciences

Social Data Analytics prepares students to apply data science to understand sociological and political aspects of social media communication. Fundamental discipline courses lay discipline-specific foundations in social science. Core concentration courses prepare students for more advanced work with social media sources.

Category	Courses	Hours
Fundamental Discipline Courses	<p>From the following courses, choose 9 hours, but no more than 6 hours in any one field:</p> <ul style="list-style-type: none"> <li>• AN 1103 Intro to Anthropology</li> <li>• AN 1143 Intro to Cultural Anthropology</li> <li>• AN 1344 Intro to Bio Anthropology</li> <li>• CO 1403 Intro to Mass Media</li> <li>• GR 2313 Maps and Remote Sensing</li> <li>• PS 1313 Intro to International Relations</li> <li>• PS 1513 Comparative Government</li> <li>• PS 2703 Intro to Public Policy</li> <li>• CRM 1003 Crime and Justice in America</li> <li>• SO 1003 Intro to Sociology</li> <li>• SO 1103 Contemporary Social Problems</li> </ul>	9
Core Concentration Courses	<p>Choose 15 hours from the following 3-hour courses:</p> <ul style="list-style-type: none"> <li>• AN 3343 Intro to Forensic Anthropology</li> <li>• AN 4173 Environment and Society</li> <li>• AN 4163 Anthropology of International Development</li> <li>• AN 4323 Plagues and People</li> <li>• CO 4213 Political Communication</li> <li>• CO 4283 Health Communication</li> <li>• CRM 4253 White Collar and Computer Crime</li> <li>• GR 3303 Survey of Geospatial Technologies</li> <li>• GR 4123 Urban Geography</li> <li>• PS 4243 State Election Policy and Politics</li> <li>• PS 4283 Public Opinion</li> <li>• PS 4293 Political Behavior</li> <li>• PS 4343 International Conflict and Security</li> <li>• PS 4373 International Terrorism</li> <li>• PS 4464 Political Analysis</li> <li>• PS 4523 Democracy and Inequality</li> <li>• PS 4613 Civil Wars and Intra-State Conflict</li> <li>• SO 3303 Rural Sociology</li> </ul>	15

	<ul style="list-style-type: none"> <li>• SO 4113 Social Organization and Change</li> <li>• SO 4123 Poverty, Analysis: People, Organization, and Program</li> <li>• SO 4173 Environment and Society</li> </ul>	
Capstone	Students will Register for the Following: <ul style="list-style-type: none"> <li>• DSCI 4553: Capstone Project 1 for Bachelor of Science in Data Science</li> <li>• DSCI 4663: Capstone Project 2 for Bachelor of Science in Data Science</li> </ul>	6
	Total	30

### Psycho-informatics

College: College of Arts and Sciences

Psycho-informatics is subfield of psychology for the acquisition, organization, and synthesis of data collected from psychology to reveal information about psychological traits such as personality and mood. Psychology has historically relied on experiments and questionnaires to collect data. These methods face several disadvantages such as small number of participants and bias and unreliable memory. Psycho-informatics solves these problems by storing Big Data related to psychology (such as communications on smartphones or social media websites) and then data mining for relevant psychological information. This concentration prepares students to apply data science to the field of psychology. Fundamental discipline courses lay discipline-specific foundations in psychology. Core concentration courses prepare students for more advanced work with cognitive science and psychology. Students in the Psychology concentration are recommended to take PSY 1013 as their second required social science general education course.

Category	Courses	Hours
Fundamental Discipline Courses	<ul style="list-style-type: none"> <li>• PSY 1021 Careers in Psychology</li> <li>• PSY 3104 Introductory Psychological Stats</li> <li>• PSY 3314 Experimental Psychology</li> </ul>	9
Core Concentration Courses	Choose 9 hours from the following 3-hour courses: <ul style="list-style-type: none"> <li>• PSY 3343 Psychology of Learning</li> <li>• PSY 3623 Social Psychology</li> <li>• PSY 3713 Cognitive Psychology</li> <li>• PSY 3803 Intro to Developmental Psych</li> <li>• PSY 4403 Biological Psychology</li> </ul> Choose 6 hours from among any of the 4000 level Psychology courses.	15
Capstone	<ul style="list-style-type: none"> <li>• PSY 4000 Directed Individual Study in Psychology</li> <li>•</li> </ul> Students must perform research in a laboratory and present their capstone project at the Undergraduate Research Symposium.	6
	Total	30

### Statistical Modeling

College: College of Arts and Sciences

The Statistical Modeling concentration prepares students to apply advanced statistical methods to build analytical and statistical models. Core concentration courses prepare students for more advanced work in statistics. The concentration focuses on statistical models and methods that are needed to discover and validate patterns in Big Data. It includes upper-levels statistics and mathematics courses and a two-semester practicum to apply the theoretical machinery of quantitative methods to the solution of real-world problems involving Big-Data.

Category	Courses	Hours
Core Concentration Courses	Complete 24 hours from the following 3-hour courses: <ul style="list-style-type: none"> <li>• MA 2923 Intro. to Modern Scientific Computing</li> <li>• MA 4183 Math. Found. of Machine Learning</li> <li>• MA 4133 Discrete Mathematics</li> <li>• MA 4143 Graph Theory</li> <li>• ST 4213 Nonparametric</li> <li>• ST 4313 Intro to Spatial Statistics</li> <li>• ST 4543 Intro to Mathematical Statistics I</li> <li>• ST 4243 Data Analysis I</li> </ul>	24
Capstone	Students will Register for the Following: <ul style="list-style-type: none"> <li>• DSCI 4553: Capstone Project 1 for Bachelor of Science in Data Science</li> </ul>	6

	<ul style="list-style-type: none"> <li>DSCI 4663: Capstone Project 2 for Bachelor of Science in Data Science</li> </ul>	
		Total 30

### Computational Intelligence

College: Bagley College of Engineering

Computational Intelligence focuses on understanding artificial intelligence and machine learning approaches to develop effective strategies to solve large-scale data science problems. This includes creation of new software tools, algorithms, and using existing programs and libraries. The concentration includes foundational courses in software development, algorithms, artificial intelligence, and machine learning. These ideas are then applied in various computer science-related contexts in upper-level courses and in a two-semester practicum.

Category	Courses	Hours
Core Concentration Courses	<ul style="list-style-type: none"> <li>CSE 2213 Methods &amp; Tools in Software Development</li> <li>CSE 4163 Designing Parallel Algorithms</li> <li>CSE 4683 Machine Learning and Soft Computing</li> <li>CSE 4833 Introduction to Algorithms</li> <li>CSE 4643 AI Robotics</li> <li>CSE 4623 Computational Biology</li> <li>CSE 4653 Cognitive Science</li> <li>CSE 4293 Artificial Intelligence for Cybersecurity</li> </ul>	24
Capstone	Students will Register for the Following: <ul style="list-style-type: none"> <li>DSCI 4553: Capstone Project 1 for Bachelor of Science in Data Science</li> <li>DSCI 4663: Capstone Project 2 for Bachelor of Science in Data Science</li> </ul>	6
		Total 30

### Geoinformatics

College: College of Arts and Sciences

The Geoinformatics concentration includes courses in three categories within the Department of Geosciences, comprising a total of 30 hours, with a focus on geospatial data acquisition and analysis. This includes nine hours of required coursework related to: (1) statistical analysis of geospatial data, (2) analysis and visualization of spatial data using Geographic Information Systems (GIS), and (3) acquisition of spatial information from remote sensing platforms. A further 15 hours will consist of courses in meteorology/climatology, geospatial science, and/or geology, with specific courses chosen based on student interest. These courses serve as the basis for attaining core knowledge on the nature and processes related to geoscience data, which is critical for applying data science skills in an appropriate and representative way with respect to geospatial information. The courses also act to showcase the specific applications of data science within the geoscience community, which will help students define future research strategies and interests as well as prepare them for careers as data scientists and geoinformatics professionals. The final six-hour capstone course will provide a means to apply general and discipline-specific data science skills by working directly with one or more geoscience research faculty. The course will involve designing and completing a research-based project that requires acquiring, analyzing, and interpreting geospatial information using sound scientific principles and critical thinking. By completing the Geoinformatics concentration within the Data Science BS, students will learn not only the skills and techniques required to be successful data scientists within the geospatial community, but also the knowledge necessary to make critical and relevant decisions within the scientific fields that rely on the collection and interpretation of spatial information.

Category	Courses	Hours
Fundamental Discipline Courses	Required courses (9 hours) <ul style="list-style-type: none"> <li>GR 4303 Principles of GIS<sup>2</sup></li> <li>Choose one of the following:               <ul style="list-style-type: none"> <li>GR 4333 Remote Sensing of the Physical Environment<sup>2</sup></li> <li>GR 4783 Satellite Meteorology</li> <li>GR 4883 Radar Meteorology</li> </ul> </li> <li>GR 4633 Statistical Climatology</li> </ul>	9
Core Concentration Courses	Elective courses (15 hours – choose 5 from the following) <ul style="list-style-type: none"> <li>GR 4733 Synoptic Meteorology</li> <li>GR 4643 Physical Meteorology and Climatology I</li> <li>GR 4693 Physical Meteorology and Climatology II</li> <li>GR 4613 Applied Climatology</li> <li>GR 4783 Satellite Meteorology<sup>1</sup></li> <li>GR 4883 Radar Meteorology<sup>1</sup></li> </ul>	15

	<ul style="list-style-type: none"> <li>• GR 4553 Computer Methods in Meteorology</li> <li>• GR 4313 Advanced GIS<sup>2</sup></li> <li>• GR 4323 Cartographic Sciences<sup>2</sup></li> <li>• GR 4333 Remote Sensing of the Physical Environment<sup>1,2</sup></li> <li>• GR 4343 Advanced Remote Sensing<sup>2</sup></li> <li>• GR 4363 GIS Programming<sup>2</sup></li> <li>• GR 4123 Urban Geography</li> <li>• GG 3613 Water Resources</li> <li>• GG 4233 Applied Geophysics</li> <li>• GG 4413 Structural Geology</li> <li>• GG 4503 Geomorphology</li> <li>• GG 4523 Coastal Environments</li> <li>• GG 4543 Community Engagement in Geosciences</li> <li>• GG 4613 Physical Hydrogeology</li> </ul> <p><sup>1</sup> Can be used as remaining hours if not already used for the required concentration  <sup>2</sup> Counts towards the Geospatial and Remote Sensing Minor</p>	
Capstone	Students will Register for the Following: <ul style="list-style-type: none"> <li>• DSCI 4553: Capstone Project 1 for Bachelor of Science in Data Science</li> <li>• DSCI 4663: Capstone Project 2 for Bachelor of Science in Data Science</li> </ul>	6
	Total	30

**6 Describe the faculty who will deliver this degree program including the members' names, ranks, disciplines, current workloads, and specific courses they will teach within the program. If it will be necessary to add faculty to begin the program, give the desired qualifications of the persons to be added.**

All the faculty necessary to teach the program courses are already present at MSU. Most of the courses and other instructional activities necessary to fulfill the coursework requirements are already available in the MSU course catalog. To be sure, Mississippi State has an ongoing, strong focus on data science. More than 350 faculty and research scientists in a recent survey conducted by the Office of the Provost reported active involvement in data science research, teaching, and service and rated their expertise as either experts in data science theoretical frameworks, methods, and tools or as users of data science methods and tools. These faculty and research scientists are expected to provide the foundational intellectual capacity for the successful delivery of the program, especially in the concentration areas. Below find lists of faculty that will be involved in the teaching of the coursework for this program.

**Program Core: General Education**

Course Number	Course Name	Instructor	Rank
PHI 1113	Introduction to Logic	Dr. Alicia Hall	Associate Professor
PHI 1113	Introduction to Logic	Dr. Lynn Holt	Professor
PHI 1113	Introduction to Logic	Dr. Gregory Johnson	Instructor

**Program Core: Mathematics and Statistics**

Course Number	Course Name	Instructor	Rank
MA 1713	Calculus I	Dr. Robert Banik	Instructor
MA 1723	Calculus II	Dr. Robert Banik	Instructor
MA 2733	Calculus III	Dr. Robert Banik	Instructor
MA 1713	Calculus I	Dr. Snehalatha Ballamoole	Assistant Clinical Professor
MA 2733	Calculus III	Dr. Snehalatha Ballamoole	Assistant Clinical Professor
MA 3113	Introduction to Linear Algebra	Dr. Snehalatha Ballamoole	Assistant Clinical Professor
MA 1713	Calculus I	Dr. Jennifer Beckman	Instructor
MA 1723	Calculus II	Dr. Jennifer Beckman	Instructor
MA/ST 3123	Introduction to Statistical Inference	Dr. Jennifer Beckman	Instructor
MA 1713	Calculus I	Dr. Velinda Calvert	Assistant Clinical Professor
MA 1723	Calculus II	Dr. Velinda Calvert	Assistant Clinical Professor
MA 3113	Introduction to Linear Algebra	Dr. Velinda Calvert	Assistant Clinical Professor
MA 1713	Calculus I	Dr. Abigail Good	Instructor
MA 1723	Calculus II	Dr. Abigail Good	Instructor
MA 2733	Calculus III	Dr. Abigail Good	Instructor
MA 1713	Calculus I	Dr. Julie Nation	Instructor
MA 1723	Calculus II	Dr. Julie Nation	Instructor
MA 2733	Calculus III	Dr. Julie Nation	Instructor

MA 1713	Calculus I	Dr. Amber Robinson	Instructor
MA 1723	Calculus II	Dr. Amber Robinson	Instructor
MA 2733	Calculus III	Dr. Amber Robinson	Instructor
MA 1713	Calculus I	Dr. Jaelyn Smith	Instructor
MA 1723	Calculus II	Dr. Jaelyn Smith	Instructor
MA 2733	Calculus III	Dr. Jaelyn Smith	Instructor
MA 1713	Calculus I	Dr. Jacob Tschume	Instructor
MA 1723	Calculus II	Dr. Jacob Tschume	Instructor
MA 3113	Introduction to Linear Algebra	Dr. Jacob Tschume	Instructor
MA 1713	Calculus I	Dr. Kim Walters	Instructor
MA 1723	Calculus II	Dr. Kim Walters	Instructor
MA 2733	Calculus III	Dr. Kim Walters	Instructor
MA 1713	Calculus I	Dr. Danielle Young	Instructor
MA 1723	Calculus II	Dr. Danielle Young	Instructor
MA 2733	Calculus III	Dr. Danielle Young	Instructor

**Program Core: Computer Science**

Course Number	Course Name	Instructor	Rank
CSE 1284	Introduction to Computer Programming	Mr. Joshua Crowson	Instructor
CSE 1384	Intermediate Computer Programming	Ms. Kortni Neal	Instructor
CSE 2813	Discrete Structures	Dr. Andy Perkins	Professor
CSE 2383	Data Structures and Analysis of Algorithms	Mr. Aubrey Knight	Instructor
CSE 3763	Legal and Ethical Issues in Computing	Dr. David Lee, J.D.	Lecturer
CSE 4503	Database Management Systems	Coordinator: Dr. Andy Perkins	Professor
CSE 4633	Artificial Intelligence	Dr. Eric Hansen	Associate Professor

**Program Core: Communications**

Course Number	Course Name	Instructor	Rank
CO 3213	Small Group Communication	Dr. Amy Knight	Instructor
CO 3223	Communication and Media Research Methods	Dr. Holli Seitz	Assistant Professor
CO 3213	Small Group Communication	Dr. John Nicholson	Associate Professor

**Program Core: Data Science Proper**

Course Number	Course Name	Instructor	Rank
DSCI 3013	Fundamentals of Data Acquisition	Dr. Mimmo Parisi	Professor
DSCI 3013	Fundamentals of Data Acquisition	Dr. Jonathan Barlow	Instructor
DSCI 2012	Data Science Lab 1 – Data Wrangling	Dr. Mimmo Parisi	Professor
DSCI 2012	Data Science Lab 1 – Data Wrangling	Dr. Jonathan Barlow	Instructor
DSCI 3012	Data Science Lab 2 – Description, Analysis, and Inference	Dr. Mimmo Parisi	Professor
DSCI 3012	Data Science Lab 2 – Description, Analysis, and Inference	Dr. Jonathan Barlow	Instructor
DSCI 3022	Data Science Lab 3 – Data Visualization	Dr. Mimmo Parisi	Professor
DSCI 3022	Data Science Lab 3 – Data Visualization	Dr. Jonathan Barlow	Instructor
DSCI 3032	Data Science Lab 4 – Artificial Intelligence	Dr. Mimmo Parisi	Professor
DSCI 3032	Data Science Lab 4 – Artificial Intelligence	Dr. Jonathan Barlow	Instructor
DSCI 2022	Data Science Lab 5 – Cloud, Quantum, and High-Performance Computing	Dr. Mimmo Parisi	Professor



<b>DSCI 2022</b>	Data Science Lab 5 – Cloud, Quantum, and High-Performance Computing	Dr. Jonathan Barlow	Instructor
<b>DSCI 4013</b>	Data Visualization	Dr. Bimal Balakrishnan	Professor
<b>DSCI 4553</b>	Capstone Project 1	Faculty per Concentration	
<b>DSCI 4663</b>	Capstone Project 2	Faculty per Concentration	

**Program Core: Business Information Systems**

<b>Course Number</b>	<b>Course Name</b>	<b>Instructor</b>	<b>Rank</b>
<b>BIS 3233</b>	Management Information Systems	Dr. Merrill Warkentin	Professor
<b>BIS 3233</b>	Management Information Systems	Dr. Kent Maret	Associate Professor
<b>BIS 3233</b>	Management Information Systems	Dr. Alaa Nehme	Assistant Professor
<b>BIS 3753</b>	Business Database Systems	Dr. David Sikolia	Assistant Clinical Professor
<b>BIS 3753</b>	Business Database Systems	Dr. Martin Kang	Assistant Professor
<b>BIS 3753</b>	Business Database Systems	Dr. Merrill Warkentin	Professor

**Program Concentration: Visualization and Visual Analytics for Built Environment:**

<b>Course Number</b>	<b>Course Name</b>	<b>Instructor</b>	<b>Rank</b>
<b>ART 1123</b>	Design I (2D)	Dr. Katherine Voorhies	Lecturer
<b>ART 1123</b>	Design I (2D)	Dr. Rowan Haug	Instructor
<b>ART 2803</b>	Introduction to Comp. Art	Dr. Katherine Voorhies	Lecturer
<b>ART 2813</b>	Intermediate Computing for Design	Dr. Jeralyn Powney	Associate Professor
<b>ART 4813</b>	Multimedia I	Dr. Keum Taek Jung	Assistant Professor
<b>BCS 2313</b>	Virtual Design and Construction	TBD	
<b>ID 3603</b>	Digital Design for Interiors	Dr. Lyndsey Miller	Associate Professor
<b>ID 3363</b>	3D CAD Modeling	Dr. Lyndsey Miller	Associate Professor
<b>ARC 2713</b>	Passive Building Systems	Dr. Duane McLemore	Assistant Professor
<b>ARC 3723</b>	Active Building Systems	Dr. John Ross	Assistant Professor
<b>ARC 4633</b>	Architecture and Virtual Spaces	Dr. Duane McLemore	Assistant Professor

**Program Concentration: Computational Agriculture and Natural Resources:**

<b>Course Number</b>	<b>Course Name</b>	<b>Instructor</b>	<b>Rank</b>
<b>EC 2113</b>	Principles of Macroeconomics	Dr. Heriberto Gonzalez	Assistant Clinical Professor of Economics
<b>EC 3123</b>	Intermediate Microeconomics	Dr. Sandra Orozco-Aleman	Associate Professor of Economics
<b>EC 3123</b>	Intermediate Microeconomics	Dr. Todd Jones	Assistant Professor of Economics
<b>AEC 2713</b>	Introduction to Food and Resource Economics	Dr. Matthew Janzen	Instructor
<b>AEC 2713</b>	Introduction to Food and Resource Economics	Dr. Will Davis	Assistant Professor
<b>AEC 2223</b>	Introduction to Sustainability Economics	Dr. Seong Do Yun	Assistant Professor
<b>AEC 3133</b>	Introduction to Agribusiness Management	Dr. McKenzie Maples	Instructor
<b>AEC 3233</b>	Introduction to Environmental Economics and Policy	Dr. Matthew Interis	Professor
<b>AEC 4123</b>	Financial and Commodity Futures Marketing	Dr. William Maples	Assistant Professor
<b>AEC 4133</b>	Analysis of Food Markets and Prices	Dr. Kayln Coatney	Associate Professor
<b>AEC 4223</b>	Applied Quantitative Analysis in Agricultural Economics	Dr. Elizabeth Canales	Assistant Professor
<b>AEC 4363</b>	Economics of Precision Agriculture	Dr. Xiaofei Li	Assistant Professor
<b>AEC 4413</b>	Public Problems of Agriculture	Dr. Joshua Maples	Assistant Professor
<b>AEC 4733</b>	Econometric Analysis in Agricultural Economics	Dr. Ardian Harri	Professor
<b>BCH 4414</b>	Protein Methods	Dr. Natraj Krishnan	Associate Professor

<b>BCH 4414</b>	Protein Methods	Dr. Xueyan Shan	Associate Research Professor
<b>BCH 3102</b>	Essential Biochemical Concepts and Analysis	Dr. Florencia Meyer	Associate Professor
<b>BCH 4803</b>	Introduction to Remote Sensing Technologies	Dr. Federico Hoffmann	Associate Professor
<b>PSS 4483</b>	Introduction to Remote Sensing Technologies	Dr. Vitor Martins	Assistant Professor
<b>PSS 4543</b>	Precision Agriculture II	Dr. Amelia Fox	Assistant Clinical Professor
<b>PSS 2543</b>	Precision Agriculture I	Dr. Timothy Bradford Jr	Instructor
<b>ABE 2173</b>	Principles of Agricultural and Off-Road Machines	Dr. Nuwan Wijewardane	Assistant Professor
<b>ABE 4163</b>	Machine Management Agro-Ecosystems	Dr. Nuwan Wijewardane	Assistant Professor
<b>ABE 2873</b>	Land Surveying (Spring)	Dr. John Wes Lowe	Assistant Professor
<b>ABE 2873</b>	Land Surveying (Fall)	Dr. Joel Paz	Professor
<b>ABE 4263</b>	Soil and Water Management	Dr. Joel Paz	Professor
<b>ABE 3513</b>	The Global Positional System and Geographic Information Systems in Agriculture and Engineering	Dr. Xin Zhang	Assistant Professor
<b>ABE 4463</b>	Introduction to Imaging in Biological Systems	Dr. Yuzhen Lu	Assistant Professor
<b>ABE 4483</b>	Introduction to Remote Sensing Technologies	Dr. Vitor Martins	Assistant Professor
<b>ABE 1863</b>	Engineering Technology in Agriculture	Dr. Prem Parajuli	Professor
<b>ABE 1863</b>	Engineering Technology in Agriculture	Dr. Chad Winter	ABE Advisory Board Member
<b>WFA 3133</b>	Applied Ecology	Dr. Sandra B. Correa	Assistant Professor
<b>WFA 4113</b>	Animal Behavior	Dr. Kristine O. Evans	Assistant Professor
<b>WFA 4243</b>	Wildlife Techniques	Dr. Dana Morin	Assistant Professor
<b>WFA 4123</b>	Wildlife and Fisheries Biometrics	Dr. Garrett Street	Associate Professor
<b>WFA 4253</b>	Application of Spatial Technologies to Wildlife and Fisheries Management	Dr. Eric Hileman	Assistant Research Professor
<b>FO 4113</b>	Forest Resource Economics	Dr. Robert Grala	Professor
<b>FO 2213</b>	Forest Measurements	Dr. Joshua Granger	Assistant Professor
<b>FO 4123</b>	Forest Ecology	Dr. Austin Himes	Assistant Professor
<b>FO 4213</b>	Forest Biometrics	Dr. Krishna Poudel	Assistant Professor
<b>FO 4313</b>	Spatial Techniques in Natural Resources Management	Dr. Jia Yang	Assistant Professor
<b>FO 4453</b>	Remote Sensing Applications	Dr. Jia Yang	Assistant Professor
<b>FO 4473</b>	GIS for Natural Resource Management	Dr. Jia Yang	Assistant Professor
<b>SBP 1103</b>	Introduction to Sustainable Bioproducts	Dr. Tamara Franca	Assistant Professor
<b>SBP 2012</b>	Introduction to Bioproducts Industries	Dr. Jason Street	Associate Professor
<b>SBP 2123</b>	Materials and Processing of Structural Bioproducts	Dr. Frederico Franca	Assistant Research Professor
<b>SBP 4013</b>	Wood Anatomy	Dr. Frank Owens IV	Assistant Professor
<b>SBP 4253</b>	Quantitative Methods in Sustainable Bioproducts	Dr. Roy Seale	Professor
<b>ADS 1113</b>	Animal Science (Fundamental Course)	Dr. Jamie Larson	Professor
<b>ADS 1113</b>	Animal Science (Fundamental Course)	Dr. Marcus McGee	Assistant Clinical Professor
<b>ADS 3013</b>	Anatomy and Physiology	Dr. Caleb Lemley	Associate Professor
<b>ADS 3313</b>	Introduction to Meat Science	Dr. Thu Dinh	Associate Professor
<b>ADS 4523</b>	Internet Based Management in Livestock Industries	Dr. Jane Parish	Professor
<b>ADS 4523</b>	Internet Based Management in Livestock Industries	Dr. Kelsey Harvey	Professor

**Program Concentration: Business Information Systems:**

Course Number	Course Name	Instructor	Rank
BIS 4113	BIS Security Management	Dr. Kent Maret	Associate Professor
BIS 4113	BIS Security Management	Dr. Merrill Warkentin	Professor
BIS 4113	BIS Security Management	Dr. Alaa Nehme	Assistant Professor
BIS 4533	Decision Support Systems	Dr. Robert Otondo	Professor
BIS 4533	Decision Support Systems	Dr. Alaa Nehme	Assistant Professor
BIS 4533	Decision Support Systems	Dr. Merrill Warkentin	Professor
BIS 4533	Decision Support Systems	Dr. Martin Kang	Assistant Professor
BIS 4753	Structured Systems Analysis and Design	Dr. Merrill Warkentin	Professor
BIS 4753	Structured Systems Analysis and Design	Dr. David Sikolia	Assistant Clinical Professor
BIS 4763	Senior Seminar	Dr. Alaa Nehme	Assistant Professor
BIS 4763	Senior Seminar	Dr. Martin Kang	Assistant Professor
BIS 4763	Senior Seminar	Dr. Merrill Warkentin	Professor

**Program Concentration: Marketing and Supply Chain Analysis:**

Course Number	Course Name	Instructor	Rank
MKT 3013	Principles of Marketing	Dr. Melissa Moore	Professor, Department Chair
MKT 3323	International Logistics	Dr. Frank Adams	Associate Professor
BQA 4423	Business Decision Analysis	Dr. Yueran Zhuo	Assistant Professor
BIS 4533	Decision Support Systems	IS Faculty Member	
MKT 4533	Marketing Research	Dr. Bingyang Hu	Assistant Professor
MKT 4213	Internet Marketing	Dr. Robert Moore	Professor
MKT 4033	International Transportation	Dr. Christopher Boone	Assistant Professor
MKT 4013	Procurement	Dr. Frank Adams	Associate Professor
MKT 4313	Physical Distribution Management	Dr. Jason Lueg	Professor
MKT 4333	International Supply Chain Management	Dr. Lu He	Instructor
BQA 4413	Business Forecasting & Predictive Analytics	Dr. Stephen France	Associate Professor

**Program Concentration: Social Data Analytics:**

Course Number	Course Name	Instructor	Rank
AN Courses		Dr. Shane Miller	Associate Professor
AN Courses		Dr. Jordan Lynton	Assistant Professor
PS Courses		Dr. Brian Shoup	Associate Professor
PS Courses		Dr. Ben Tkach	Assistant Professor
CRM Courses		Dr. Dave May	Professor
SO Courses		Dr. Margaret Ralston	Associate Professor
CO Courses		Dr. Holli Seitz	Assistant Professor
GR Courses		Dr. Qingmin Meng	Associate Professor

**Program Concentration: Psycho-informatics:**

Course Number	Course Name	Instructor	Rank
PSY 1021	Careers in Psychology	Dr. Rebecca Armstrong	Instructor
PSY 3803	Introduction to Developmental Psychology	Dr. Rebecca Armstrong	Instructor
PSY 3104	Introductory Psychological Stats	Dr. Bennett Porter	Associate Professor
PSY 3314	Experimental Psychology	Dr. Clifford McKinney	Professor
PSY 3623	Social Psychology	Dr. Hillary Sinclair	Associate Professor
PSY 3623	Social Psychology	Dr. Carolyn Adams-Price	Associate Professor
PSY 3713	Cognitive Psychology	Dr. Julia Soares	Assistant Professor
PSY 3713	Cognitive Psychology	Dr. Andrew Jarosz	Associate Professor
PSY 3343	Psychology of Learning	Dr. Andrew Jarosz	Associate Professor
PSY 4403	Biological Psychology	Dr. Kimberly Brown	Lecturer

**Program Concentration: Statistical Modeling:**

Course Number	Course Name	Instructor	Rank
MA 2923	Introduction to Modern Sci. Comp.	Dr. Amanda Diegel	Assistant Professor
MA 4183	Math. Found. Of Machine Learning	Dr. Amanda Diegel	Assistant Professor
MA/ST 4523	Introduction to Probability	Dr. Jan DuBien	Associate Professor
MA 2923	Introduction to Modern Sci. Comp.	Dr. Seongjai Kim	Professor
MA 4183	Math. Found. Of Machine Learning	Dr. Seongjai Kim	Professor
ST 4313	Introduction to Spatial Statistics	Dr. Vu Thai Luan	Assistant Professor
MA 2923	Introduction to Modern Sci. Comp.	Dr. Vu Thai Luan	Assistant Professor
MA 4183	Math. Found. Of Machine Learning	Dr. Vu Thai Luan	Assistant Professor
MA/ST 3123	Introduction to Statistical Inference	Dr. Xinyuan Chen	Assistant Professor
MA/ST 4523	Introduction to Probability	Dr. Xinyuan Chen	Assistant Professor
ST 4313	Introduction to Spatial Statistics	Dr. Xinyuan Chen	Assistant Professor
ST 4543	Introduction to Math Stats. I	Dr. Prakash Patil	Professor
ST 4243	Data Analysis	Dr. Jingyi Shi	Assistant Professor
ST/MA 2923	Introduction to Modern Sci. Comp.	Dr. Jingyi Shi	Assistant Professor
MA 4143	Graph Theory	Dr. Vaidyanathan Sivaraman	Assistant Professor
MA 4133	Discrete Mathematics	Dr. Vaidyanathan Sivaraman	Assistant Professor
ST 4313	Introduction to Spatial Statistics	Dr. Jon Woody	Associate Professor
ST 4243	Data Analysis	Dr. Jon Woody	Associate Professor
ST 4213	Nonparametric	Dr. Tung-Lung Wu	Associate Professor
ST 4543	Introduction to Math Stats. I	Dr. Tung-Lung Wu	Associate Professor
MA/ST 4523	Introduction to Probability	Dr. Tung-Lung Wu	Associate Professor
ST 4213	Nonparametric	Dr. Shantia Yarahmadian	Associate Professor
MA 2923	Introduction to Modern Sci. Comp.	Dr. Shantia Yarahmadian	Associate Professor
MA 4183	Math. Found. Of Machine Learning	Dr. Shantia Yarahmadian	Associate Professor
ST 4213	Nonparametric	Dr. Jialin Zhang	Assistant Professor
ST 4243	Data Analysis	Dr. Jialin Zhang	Assistant Professor
ST 4213	Nonparametric	Dr. Qian Zhou	Assistant Professor
ST 4243	Data Analysis	Dr. Qian Zhou	Assistant Professor

**Program Concentration: Computational Intelligence:**

Course Number	Course Name	Instructor	Rank
CSE 2213	Methods & Tools in Software Development	Ms. Kortni Neal	Instructor
CSE 4163	Designing Parallel Algorithms	Dr. Ed Luke	Professor
CSE 4683	Machine Learning and Soft Computing	Dr. Shahram Rahimi	Professor
CSE 4833	Introduction to Algorithms	Dr. Maxwell Young	Assistant Professor
CSE 4643	AI Robotics	Dr. Jingdao Chen	Assistant Professor
CSE 4623	Computational Biology	Dr. Andy Perkins	Professor
CSE 4653	Cognitive Science	Coordinator: Dr. Shahram Rahimi	Professor
CSE 4293	AI for Cybersecurity	Dr. Sudip Mittal	Assistant Professor

**Program Concentration: Geoinformatics:**

Course Number	Course Name	Instructor	Rank
GR 4303	Principles of GIS	Dr. Shrinidhi Ambinakudige	Professor
GR 4333	Remote Sensing of the Physical Environment	Dr. Padmanava Dash	Associate Professor
GR 4783	Satellite Meteorology	Dr. Kim Wood	Assistant Professor

GR 4883	Radar Meteorology	Dr. Mike Brown	Professor
GR 4633	Statistical Climatology	Dr. Andrew Mercer	Professor
GR 4733	Synoptic Meteorology	Dr. Andrew Mercer	Professor
GR 4643	Phys Met and Clim I	Dr. Kim Wood	Assistant Professor
GR 4693	Phys Met and Clim II	Dr. Chris Fuhrmann	Associate Professor
GR 4613	Applied Climatology	Dr. Boniface Fosu	Assistant Professor
GR 4553	Comp Methods in Met	Dr. Erik Fraza	Assistant Professor
GR 4313	Advanced GIS	Dr. Qingmin Meng	Associate Professor
GR 4323	Cartographic Sciences	Dr. Qingmin Meng	Associate Professor
GR 4343	Adv. Remote Sensing	Dr. Padmanava Dash	Associate Professor
GR 4363	GIS Programming	Dr. Qingmin Meng	Associate Professor
GR 4123	Urban Geography	Dr. Brian Williams	Assistant Professor
GG 3613	Water Resources	Dr. Varun Paul	Assistant Professor
GG 4233	Applied Geophysics	Dr. Adam Skarke	Associate Professor
GG 4413	Structural Geology	Dr. Kelsey Warden	Assistant Professor
GG 4503	Geomorphology	Dr. Sarah Lalk	Assistant Professor
GG 4523	Coastal Environments	Dr. Adam Skarke	Associate Professor
GG 4543	Community Engaged Geosciences	Dr. Sarah Lalk	Assistant Professor
GG 4613	Physical Hydrogeology	Dr. Varun Paul	Assistant Professor

As the program evolves over the next five years, additional resources will be required to cover the new data science courses and other instructional activities and to cover new sections necessary to meet the growth of the number of students enrolled in the core program courses. Five new data science courses along with five data science labs have already been developed to ensure that the proposed program will meet all the learning objectives and outcomes expected for the accreditation of a Bachelor of Science in Data Science. Currently we have the faculty to teach these new courses and labs. But in the next five years, depending upon enrollment, new faculty lines will be required to support and maintain the growth of the program.

**7 Describe the library holdings relevant to the proposed program, noting strengths and weaknesses. If there are guidelines for the discipline, do current holdings meet or exceed standards?**

The Mississippi State library has adequate holding for the proposed programs, especially in the core program areas and the identified concentration areas. In the field of data science, students and faculty can generally rely on open-source resources that include software, data, and tutorials. They can also rely on open access journals and books. Additionally, MSU has access to additional resources through the SEC Library Consortium agreement. The Mississippi State library holds the following databases that are specifically relevant to the data science program. These databases host a variety of journals, conferences, and workshops:

- Academic Search Complete
- ACM Digital Library
- ASTM Digital Library

**8 Describe the procedures for evaluation of the program and its effectiveness in the first five years of the program, including admission and retention rates, program outcome assessments, placement of graduates, changes in job market need/demand, ex-student/graduate surveys, or other procedures.**

The program's success will be built on championing program evaluation as means to promote a culture of continued quality improvement as part of the overall effort to achieve the learning objectives set forth by the program effectively. This will create an environment where assessment and evaluation are embedded in the regular discourse surrounding quality improvement for curriculum and student experience. This will be accomplished by developing an evaluation plan that will provide key indicators to gauge student learning outcomes, quality of instruction, and quality of the overall strategy for the delivery of the program. Data for measuring student learning outcomes will come from assessments such as exams, quizzes, homework, and laboratory assignments. Data for measuring quality of instruction will come from student faculty evaluations and other metrics available for assessment of instruction. The overall quality of the programs will be assessed by looking at completion rates or the number of students who completed the program in 4, 5 and 6 years. It will also include placement rates or the number of students who find a job within 3 months, 6 months, and a year of graduation and an indicator that measures the extent to which jobs sought by students fits their educational background. Graduates will also be surveyed to learn about the strengths and weaknesses of the program and how the program is helping them in their professional careers. External reviewers will also be identified to conduct periodic self-studies, and when possible, to seek accreditation through the ABET Computing Accrediting Commission or other accreditation bodies relevant to establishing the overall quality of the program.

**9 What is the specific basis for determining the number of graduates expected in the first five years?**

In the Fall of 2021, MSU offered its first course in data science literacy. More than 90 students enrolled and 85 completed the course successfully. In Spring of 2022, the same course was offered in-person and online and there are approximately 130 students enrolled. Based on level of interest shown for this class over the last two semesters, enrollment at the launch of the Bachelor of Science in Data Science is expected to be a minimum of 50 students in Year 1, followed by 130 in Year 2, 210 in Year 3, 310 in year 4, and 410 by the end of Year 5. A key assumption is that the first-year cohort will include an appreciable number of students who might switch majors

(switchers) or transfer from another institution. From the second cohort on, the proportion of new students is expected to increase considerably. Another assumption is that composition of student population majoring in data science will reflect the university's overall composition with 60 percent of the students being Mississippi resident students and the remaining 40 percent non-resident students.

**10 Using expected enrollment, provide the total anticipated budget for the program including implementation and 4 subsequent years (total of 5 years) of operation; any anticipated direct, indirect, and incremental costs necessary to start the program; anticipated, incremental annual revenue based on student enrollment; and other sources of funding.**

Year	Incoming Students*	Total Enrollment	Start-Up Costs	A Additional Annual Costs	B Additional Annual Revenue	C Non-Tuition Revenue	A – (B+C) Differential
2022-2023	50	50	0	227,700	373,150	0	145,450
2023-2024	80	130	0	683,700	970,190	0	286,490
2024-2025	80	210	0	849,300	1,567,230	0	717,930
2025-2026	100	310	0	849,300	2,313,530	0	1,464,230
2026-2027	100	410	0	849,300	3,059,830	0	2,210,530
<b>TOTAL</b>	<b>410</b>	410		3,459,300	8,283,930	0	4,824,630

\*Please note that the predicted number of incoming students has been on the conservative side, but we anticipate as the popularity of the degree program grows among students, that incoming student numbers may increase more rapidly.

**Please explain what has been included in the costs and revenues.**

For the first year, the initial cost will primarily include a full-time program coordinator and a half-time program advisor. The second year the cost will also include the hiring of four instructors and six teaching assistants. For the third year, depending upon enrollment, the plan is to hire four clinical professors and six teaching assistants. No startup costs are anticipated. The university will leverage existing resources for the setup of labs and GPUs.

The overall revenue estimates are based on several assumptions. The first assumption is that for the first year, most of the students will be switchers, but following the second year on, there will be primarily new students. The second assumption is that students in the data science major will reflect the university student's composition-- 60% in state and 40% out-of-state students. Another assumption is that the revenue estimates are going to be based on 50% of the tuition revenue fully dedicated for instruction. Based on these assumptions, we were able to calculate the expected revenue based on the numbers reported in the table above.

**11. Program Demand: Select one or both of the following to address student demand:**

A. Survey of Student Interest

Number of surveys administered. . . . . \_\_\_\_\_  
 Number of completed surveys returned. . . . . \_\_\_\_\_  
 Percentage of students interested in program. . . . . \_\_\_\_\_

Include a brief statement that provides additional information to explain the survey.

B. Market Analysis or Evidence of Labor Market Need

[Please limit to approximately 500 words; place your Market Analysis or Evidence of Labor Market Need here.]

Data Science experts are currently among the most sought professionals in the labor market because they allow businesses and organizations to place data at the center of their solutions. Demand for data science experts is and has been increasing since AI and Big Data have come to dominate how the private and public sectors operate to meet the demand for goods and services effectively. According to LinkedIn, since 2012 the demand for data science experts has grown by 650%. According to the U.S. Bureau of Labor Statistics, the rise of demand for data science expertise will create roughly 11.5 million new jobs by 2026. The World Economic Forum indicates that data science experts will become the number one emerging role in the world. Harvard Business Review refers to data science occupations as the "sexiest jobs of the 21st century." A recent study conducted by LinkedIn reports that data science experts earn an average annual salary between \$78,000 and \$150,000.

## **12. Employment Opportunities for Graduates (state, region, nation):**

Digital transformation is a global phenomenon creating the need for data science experts at local, regional, national, and international levels. Many businesses in Mississippi are going through the process of introducing AI and Big Data in their operations. The survival of many of these businesses will depend on their ability to find a qualified workforce to support, sustain, and expand the use of AI and Big Data in their operations. State government also is going through the same digital transformation. The shortage of data science experts in the southern region of the US threatens the economic completeness of the region. To address this challenge, the major research institutions in the Southeastern Conference (SEC) formed a consortium to leverage their educational resources toward increasing the production of undergraduates with data science and AI backgrounds. At the national level, congress is proposing an investment of over \$100M to increase the competitiveness of the US economy. We have seen similar trends at the international level. As organizations and businesses in the state and around the world turn to data solutions and AI strategies, they are also increasingly creating new economic opportunities for our graduates. Because of these trends, the Bachelor of Science in Data Science is a key program to promote economic development in the state.



**MISSISSIPPI STATE**  
UNIVERSITY™

**Office of the Provost and  
Executive Vice President**

P.O. Box BQ  
3500 Lee Hall  
Mississippi State, MS 39762

University Committee on Data Science  
Office of the Provost  
Mississippi State, MS 39762

P. 662.325.3742  
F. 662.325.4039

February 24, 2022

Andy Perkins  
University Committee on Courses and Curricula  
PO Box 5268  
Mississippi State, MS 39762

Dear Dr. Perkins:

The members of the University Committee on Data Science provide this letter to express support for the addition of the Bachelor of Science in Data Science. The proposed degree is a 123-hour Inter-College Program designed by the committee to include three general areas of coursework that draw on different disciplines available across our colleges on campus. The Office of the Provost and the Executive Vice President established the committee and charged it to provide oversight for the development of the curriculum of the new program. Committee membership includes two representatives from each college present on our campus.

The addition of this new degree program to our existing offerings will require the creation of 11 new undergraduate courses. Of those, 10 will be in the Office of the Provost and one in the Department of Computer Science. Specifically, under the Office of the Provost will be:

1. DSCI 2013 Data Science Literacy
2. DSCI 3013 Fundamentals of Data Acquisition
3. DSCI 4013 Data Visualization
4. DSCI 2012 Data Science Lab 1: Data Wrangling
5. DSCI 3012 Data Science Lab 2: Description, Analysis, and Inference
6. DSCI 3022 Data Science Lab 3: Data Visualization
7. DSCI 3032 Data Science Lab 4: Artificial Intelligence
8. DSCI 2022 Data Science Lab 5: Cloud, High-Performance, and Quantum Computing
9. DSCI 4553 Capstone Project 1 for Bachelor of Science in Data Science,
10. DSCI 4663 Capstone Project 2 for Bachelor of Science in Data Science

The department of computer science will add:

11. CSE 4293 Artificial Intelligence for Cybersecurity.

With the additional faculty resources included in the Appendix A application, the addition of these new classes should not place an undue burden on existing university faculty. The committee approved the application for the new degree program in addition to the new proposed courses on February 24th, with 22 faculty members present.

The new Bachelor of Science in Data Science degree program will add a valuable new dimension to the Mississippi State University's offerings. The new courses will be available not only for students in the new degree program, but also for students in other majors.

Sincerely,

The following undersigned members of the University Committee on Data Science.



**Data Science University Committee Members**



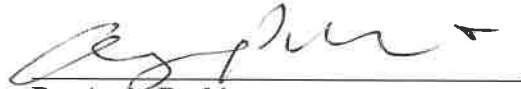
**Dr. Mimmo Parisi**

Senior Advisor for European and Data Science Dev  
Office of the Provost and Executive Vice President

*Peter L. Ryan 29<sup>th</sup> February, 2022*

**Dr. Peter Ryan**

Executive Vice President  
Office of the Provost and Executive Vice President



**Dr. Andy Perkins**

Associate Department Head  
James Worth Bagley College of Engineering



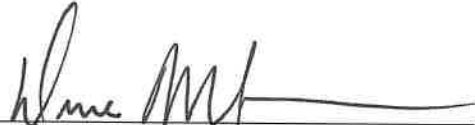
**Dr. Linkan Bian**

Associate Professor  
James Worth Bagley College of Engineering




**Dr. Bimal Balakrishnan**

Associate Dean  
College of Architecture, Art, and Design



**Dr. Duane McLemore**

Assistant Professor  
College of Architecture, Art, and Design



**Dr. Mohsen Razzaghi**

Department Head  
College of Arts and Sciences



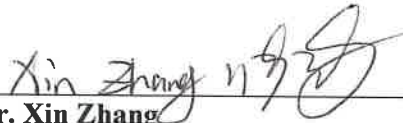
**Dr. Melanie Loehwing**

Interim Associate Dean  
College of Arts and Sciences



**Dr. Will Davis**

Assistant Professor  
College of Agriculture and Life Sciences



**Dr. Xin Zhang**

Assistant Professor  
College of Agriculture and Life Sciences



**Dr. Merrill Warkentin**

Professor  
College of Business



**Dr. Stephen France**

Associate Professor  
College of Business



**Dr. Dan Gadke**

Interim Associate Dean  
College of Education



**Dr. Kim Hall**

Interim Associate Dean of Academics  
College of Education



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**Dr. Rubin Shmulsky**  
Department Head  
College of Forest Resources



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**Dr. Guiming Wang**  
Professor  
College of Forest Resources



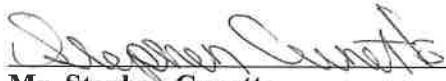
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**Dr. David Smith**  
Associate Dean  
College of Veterinary Medicine




---

**Dr. Bindu Nanduri**  
Professor  
College of Veterinary Medicine



---

**Mr. Stephen Cunetto**  
Associate Dean  
University Libraries



---

**Ms. Mary Ann Jones**  
Associate Professor  
University Libraries



---

**Dr. Jonathan Barlow**  
Instructor  
Office of the Provost and Executive Vice President



---

**Dr. Jamie Dyer**  
Assistant Vice President Intern  
Office of the Provost and Executive Vice President



MISSISSIPPI STATE  
UNIVERSITY™

COLLEGE OF EDUCATION  
Office of the Dean

Box 9710  
Mississippi State, MS 39762

(662) 325-3717  
Fax: (662) 325-8784

March 8, 2022

Dear Dr. Perkins and Members of the University Committee on Courses and Curricula:

I am writing to express support for the proposed Bachelor of Science in Data Science degree program. Although the College of Education does not have a concentration in this degree program, we recognize the benefit this program will have to the university and its students.

Sincerely,

Teresa  
Jayroe

Digitally signed by Teresa Jayroe  
DN: cn=Teresa Jayroe, o=Mississippi State  
University, ou=College of Education,  
email=TJayroe@colled.msstate.edu, c=US  
Date: 2022.01.09 06:26:11 -0600

Dr. Teresa Jayroe

Dean

*"Changing Tomorrow through Education Today"*



MISSISSIPPI STATE UNIVERSITY  
JAMES WORTH  
**BAGLEY**  
COLLEGE OF ENGINEERING

DR. JASON M. KEITH

Dean and Professor  
Earnest W. and Mary Ann Deavenport, Jr. Chair  
keith@bagley.msstate.edu

March 3, 2022

Dr. Mimmo Parisi  
Office of the Provost & Executive Vice President  
Mississippi State University  
Mississippi State, MS 39759

Dear Dr. Parisi,

I support the proposed Bachelor of Science in Data Science. As a contributor to both the curriculum core and concentration areas, we will need additional faculty resources to be able to teach the classes on the degree proposal.

Best Regards,

Jason M. Keith  
Dean and Professor  
Earnest W. and Mary Ann Deavenport, Jr. Chair



**MISSISSIPPI STATE**  
UNIVERSITY.

MISSISSIPPI AGRICULTURAL & FORESTRY EXPERIMENT STATION  
COLLEGE OF AGRICULTURE & LIFE SCIENCES

Box 9760  
Mississippi State, MS 39762  
P. 662.325.2110  
cals.msstate.edu

March 8, 2022

TO: Mimmo Paris  
Office of the Provost and Executive Vice President

FROM: Scott T. Willard  
Dean – College of Agriculture and Life Sciences

**Re: UCCC Submission of the Bachelor of Science in Data Science**  
**Concentration: Computational Agriculture and Natural Resources**

Dear Mimmo and Curriculum Committee Members:

The College of Agriculture and Life Sciences is in full support of the submission of the interdisciplinary Bachelor of Science in Data Science. Our college also welcomes our participation by hosting a concentration within this degree program, in cooperation with the College of Forest Resources, entitled, “Computational Agriculture and Natural Resources”. We have submitted this concentration for consideration by the committee as they review this degree program, and have involved our department heads, relevant faculty, and course instructors where relevant to assure our ability to offer classes and content within this program.

Should you require anything further regarding this submission or the participation of the College of Agriculture and Life Sciences please do not hesitate to contact me. We are in support of this effort and appreciate the opportunity to be included in this data science initiative aimed at training and informing students in this area for the future.

Thank you.

Sincerely,

Scott T. Willard  
Dean, College of Agriculture and Life Sciences  
Director, Mississippi Agricultural and Forestry Experiment Station



**MISSISSIPPI STATE**  
UNIVERSITY™

**COLLEGE OF BUSINESS**

Office of the Dean

P.O. Box 5288

114 McCool Hall

Mississippi State, MS 39762

P. 662.325.2580

F. 662.325.2410

[business.msstate.edu](http://business.msstate.edu)

February 28, 2022

Attention UCCC:

With this letter I am pledging the support of the College of Business for the new Data Science Program. I further am in support of the identified concentration areas, contingent on there being sufficient resources available to offer the proposed concentrations.

Sincerely,

Sharon L. Oswald

Dean, College of Business



**MISSISSIPPI STATE**  
UNIVERSITY.

COLLEGE OF FOREST RESOURCES  
FOREST AND WILDLIFE RESEARCH CENTER  
Dean and Director's Office  
Box 9680  
Mississippi State, MS 39762  
P. 662.325.2953  
cfr.msstate.edu

3/8/2022

Office of the Provost and Executive Vice President  
3501 Lee Hall  
PO Box BQ  
262 Lee Boulevard  
Mississippi State, MS 39762

Dr. Parisi:

On behalf of the College of Forest Resources (CFR), I am pleased to provide this letter of support for the proposed Bachelor of Science in Data Science. This new 123-hour inter-disciplinary degree program was developed with input from faculty within the CFR. As proposed, the Agriculture and Natural Resources concentration includes courses taught within CFR Departments of Forestry, Sustainable Bioproducts, and Wildlife, Fisheries, and Aquaculture. This degree program will allow quantitatively strong students with an interest in Food, Agriculture, and Natural Resources the opportunity to develop the skills and disciplinary expertise required to work in the rapidly evolving fields of digital agriculture, quantitative ecology, and forest biometry. This combination of skills will uniquely position these MSU graduates to be highly competitive in the emerging field of data science that transcends myriad science disciplines, including Ag and Natural Resources.

As such, the Departments within the CFR enthusiastically support this proposed degree program in Data Science and commit to offering the courses identified in the Agriculture and Natural Resources concentration.

Please feel free to contact me if you need additional information.

Sincerely,

L. Wes Burger  
Dean, College of Forest Resources



**MISSISSIPPI STATE**  
UNIVERSITY™

**COLLEGE OF ARCHITECTURE, ART AND DESIGN**  
**OFFICE OF THE DEAN**

P.O. Box AQ  
240 Giles Hall | 899 Collegeview Street  
Mississippi State, MS 39762

P. 662.325.2202  
F. 662.325.8872

[caad.msstate.edu](http://caad.msstate.edu)

4 March 2022

Dr. Mimmo Parisi  
Members of the University Data Science Program Committee  
Members of the University Committee on Courses and Curricula  
Mississippi State University

Dear Dr. Parisi and others,

I am writing to express the College of Architecture, Art, & Design's support for the addition of the Bachelor of Science in Data Science and specifically the inclusion of the concentration, Visualization and Visual Analytics for the Built Environment. Our college Data Science Working Committee is a representative body of faculty from each of the four academic units in the college. They as a collective group, with the assistance of our Associate Dean of Research, Dr. Balakrishnan, have developed and proposed the curriculum of the concentration after robust discussion and communication with all units in the college. The committee members have shared the proposal with their respective units, and we have worked closely with the directors and department heads in the college as the concentration and its courses were finalized. Once approved, and with the hope and expectation of sufficient resources, we are pleased to be a part of this new interdisciplinary university degree program.

Please do not hesitate to contact me if you need additional information, or if you have any questions.

Sincerely,

Angi Elsea Bourgeois, Ph.D.  
Dean and Professor  
College of Architecture, Art, & Design  
Mississippi State University





**MISSISSIPPI STATE**  
UNIVERSITY™

**COLLEGE OF ARTS & SCIENCES**  
Office of the Dean

P.O. Box AS  
Mississippi State, MS 39762

P. 662.325.2646

F. 662.325.8740

[www.cas.msstate.edu](http://www.cas.msstate.edu)

March 7, 2022

Dear Dr. Perkins and Members of the University Committee on Courses and Curriculum,

The College of Arts & Sciences has been asked to participate in the proposed curriculum for the Bachelor of Science in Data Science degree program. Along with providing the majority of the university general education core, and a substantial part of the DSCI major core in Mathematics, Statistics, and Communication, A&S will also offer five concentrations within the major: Social Data Analytics, Psychoinformatics, Statistical Modeling, Geosciences – Meteorology, and Geosciences – Environmental.

At present, we do not have the resources to accommodate the anticipated number of data science majors in these courses or concentrations. However, provided sufficient funding for additional faculty to accommodate the data science majors, we would be pleased to participate in this new degree program.

Sincerely,

Dr. Rick Travis  
Dean, College of Arts & Sciences



MISSISSIPPI STATE UNIVERSITY™  
UNIVERSITY LIBRARIES

March 7, 2022

Mimmo Parisi  
Senior Advisor European Development  
Professor  
Mississippi State University

Dear Dr. Parisi,

I fully support the addition of the Bachelor of Science in Data Science to Mississippi State University's existing degree offerings. This is an exciting step for Mississippi State University in expanding its curriculum to meet the needs of employers and the changing research needs within the diverse fields of academia.

I look forward to seeing how the MSU Libraries can play a role in the development of this program.

Kind regards,

Lis Pankl, PhD  
Professor and Dean of Libraries



**MISSISSIPPI STATE**  
UNIVERSITY™

**COLLEGE OF VETERINARY MEDICINE**  
Office of the Dean

P.O. Box 6100  
240 Wise Center Drive  
Mississippi State, MS 39762

P. 662.325.1131  
[www.cvm.msstate.edu](http://www.cvm.msstate.edu)

March 3, 2022

Dr. Mimmo Parisi  
Office of the Provost and Executive Vice President  
PO Box BQ  
3500 Lee Hall  
Mississippi State, MS 39762


Dear Dr. Parisi:

I am writing in support of the proposed Bachelor of Science in Data Science as an addition to the University's degree offerings. This new degree program is an inter-college program with three general areas of coursework drawing on a variety of disciplines from across campus. Careers in data science are becoming increasingly important and it is likely that this program will be in high demand among incoming undergraduate students. I believe that an undergraduate student graduating with a major in data science is currently very marketable and will be even more so in the future.

Students in the data science program choose an area of concentration from among a number of concentrations designed by participating colleges. The College of Veterinary Medicine does not currently plan to have a concentration in data science because we do not have an undergraduate educational program except for clinical training of veterinary technicians. However, we do have faculty engaged in medical data science and I hope that some data science graduates matriculate into our graduate programs or ultimately join our research faculty.

Thanks to you and the University Data Science Program Committee for developing this valuable and comprehensive undergraduate degree offering.

Sincerely,

 (on behalf of Kent Hoblet, Dean)  
Kent Hoblet, Dean

APPROVAL FORM FOR  
**DEGREE PROGRAMS**  
MISSISSIPPI STATE UNIVERSITY

**NOTE:** This form is a cover sheet that must accompany the degree program change proposal. The actual proposal should be prepared in accordance with format requirements provided in the *Guide and Format for Curriculum Proposals* published by the UCCC. Both cover sheet and proposal should be submitted to UCCC Mail Stop 9702 (281 Garner Hall), Phone: 325-9410.

**College:** Academic Affairs    **Department:** Office of the Provost and executive Vice President

**Contact Person:** Dr. Mimmo Parisi    **Mail Stop:** 9723    **Email:** m.parisi@msstate.edu  
**Nature of Change:** Certificate    **Date Initiated:** 03/10/22    **Effective Date:** Fall 2022

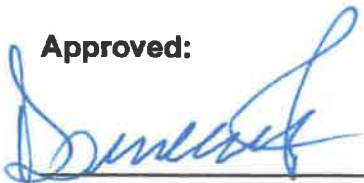
**New Degree Program Name:** Graduate Certificate for Data Science Pedagogy

**Major:** Data Science

**Summary of Proposed Changes:**

The Office of the Provost and Executive Vice President requests that the new Graduate Certificate for Data Science Pedagogy be offered.

**Approved:**

  
\_\_\_\_\_  
Department Head

**Date:**

03/07/2022  
\_\_\_\_\_

N/A

\_\_\_\_\_  
Chair, College or School Curriculum Committee

  
\_\_\_\_\_  
Dean of College or School


9<sup>th</sup> March, 2022  
\_\_\_\_\_

  
\_\_\_\_\_  
Chair, University Committee on Courses and Curricula

3/29/2022  
\_\_\_\_\_

  
\_\_\_\_\_  
Chair, Graduate Council (if applicable)

4/5/2022  
\_\_\_\_\_

  
\_\_\_\_\_  
Chair, Deans Council

12<sup>th</sup> May, 2022  
\_\_\_\_\_

**NEW DEGREE OUTLINE FORM**

Use the chart below to indicate your new degree outline. If any General Education (Core) course is acceptable in the category, please indicate by saying “any Gen Ed course.” There is no need to type in the whole list. Expand rows as needed.

<b>PROPOSED New Degree</b>	
Degree: Graduate Certificate for Data Science Pedagogy Major: Data Science Concentration	
New Degree Description	
<p>The Graduate Certificate in Data Science Pedagogy is a program that requires a minimum of 12 credit hours and is designed to prepare grade 9-14 instructors to integrate data science into instruction with the overall goal of preparing students to meet the growing demand for data science expertise in the context of ongoing digital transformation of industry: the process by which firms integrate digital technology into every aspect of operations and bring value to customers. To be credentialed to deliver data science instruction at the higher education level, students are required to take a minimum additional of 6 credit hours of course work to be selected by the students and approved by the Data Science Pedagogy Graduate Certificate committee. Organizations in every industry, including education, that do not embrace digital transform will struggle to survive the fourth industrial revolution with its blurring of boundaries between physical and digital worlds. To remain competitive in this environment, Mississippi businesses require middle-skill and high-skill data science experts. Mississippi's education and workforce development system must meet this growing demand to remain economically competitive. Yet Mississippi's educators, like those in the rest of the nation, lack adequate preparation to infuse data science into their curricula and instruction. To meet this need, the certificate includes coursework with the twofold purpose of (1) helping instructors become literate in the field of data science by understanding the role data science experts play in improving the performance of institutions, organizations, business, and society; and (2) teaching instructors how to teach the practice of data science in their own classrooms, regardless of subject. A grade point average of 3.0 or greater is required to complete the certificate.</p>	
<b>Proposed Curriculum Outline</b>	<b>Required Hours</b>
DSCI 8013 Data Science Literacy Pedagogy 1: Governance, Ethics, and Data Science Applications.  General subject-matter introduction to the field of data science and data science instruction with a focus on governance, ethics, and data science applications in many fields.	3
DSCI 8023 Data Science Literacy Pedagogy 2: Technical Overview of Data Science Methods and Strategies.  General subject-matter introduction to the field of data science and data science instruction with a focus on data science methods and practices.	3
DSCI 8033 Data Science Classroom Integration  Applying and integrating principles of data science into the context of the classroom. Topics include importance of data science across the domain; digital citizenship; career exploration; and an historical perspective on analyzing, posing, and solving problems using data.	3
CSE 8423 Data Science: Concepts and Practice  This course introduces the fundamental concepts of data science, covering data	3

representation and transformation, visual data analysis, statistical modeling, tidy and relational data, functional data-flow programming, and communicating results. The course introduces the practice of data science, using standard data science tools and languages.	
Total Hours	12

Students who complete the Graduate Certificate in Data Science Pedagogy will be able to:

- Define data science as a field of inquiry and an industry sector.
- Outline the role of data science in the context of digital transformation of institutions, organizations, businesses, and society.
- Outline data science methods and practices in the context of the entire data lifecycle including the production, acquisition, storage, and use of data to solve human problems.
- Apply and integrate principles of data science into classroom instruction.

Assessment will be realized through the Institutional Effectiveness report process. External reviewers will also be identified to conduct periodic self-studies.

SUPPORT: Letters of support from the Data Science Committee for Instruction development and Department Head of Computer Science

PROPOSED 4-LETTER ABBREVIATION: DSCI

EFFECTIVE DATE Fall 2022

CIP NUMBER: 30.7001

**Appendix 16: Intent to Offer, Modify, or Delete Certificate\* Program  
(Submit Appendix 16 in both PDF and Word Document Formats)**

**Institution:**

**Date of Implementation:**

Fall 2022

**Six-Digit CIP Code (& Four-Digit Sequence Code if modification/deletion):**

30.7001  
CIP & Sequence codes: [IHL Active Program Inventory](#)

**Total Credit Hours:**

Minimum 12 Hours

**Program Title as will Appear on Academic Program Inventory:**

Certificate of Data Science Pedagogy

Offer  Modify  Delete

**Responsible Academic Unit(s):**

Division of Academic Affairs  
Office of the Provost and Executive Vice President

**Institutional Contact:** Peter L. Ryan / Mimmo Parisi

**Phone:** 662-325-3742

**Email:** [ryan@provost.msstate.edu](mailto:ryan@provost.msstate.edu) / [m.parisi@msstate.edu](mailto:m.parisi@msstate.edu)

**Vocational Certificate:** No

**Credit Bearing Program:** Yes

Yes

**Title IV Financial Aid Eligible:**

X Yes

No

**Which of the following best describes the certificate program:** Post-Baccalaureate

**Post-Baccalaureate**

Undergraduate program with duration less than one academic year; designed for completion in less than 30 credit hours

Undergraduate program with duration at least 1 year; designed for completion in at least 30 hours; does not meet requirements for Associate's or Bachelor's degrees

**Program designed beyond the baccalaureate degree but does not meet the requirements for a master's degree**

Program designed beyond the master's degree but does not meet the requirements for a doctoral degree

Other certificate program not meeting one of the four criteria above.

**Program Summary:**

The Graduate Certificate in Data Science Pedagogy is a program that requires a minimum of 12 credit hours and is designed to prepare K-14 instructors to integrate data science into instruction with the overall goal of preparing students to meet the growing demand for data science expertise in the context of ongoing digital transformation of industry: the process by which firms integrate digital technology into every aspect of operations and bring value to customers. To be credentialed to deliver data science instruction at the higher education level, students are required to take a minimum additional of 6 credit hours of course work to be selected by the students and approved by the Data Science Pedagogy Graduate Certificate committee. Organizations in every industry, including education, that do not embrace digital transform will struggle to survive the fourth industrial revolution with its blurring of boundaries between physical and digital worlds. To remain competitive in this environment, Mississippi businesses require middle-skill and high-skill data science experts. Mississippi's education and workforce development system must meet this growing demand to remain economically competitive. Yet Mississippi's educators, like those in the rest of the nation, lack adequate preparation to infuse data science into their curricula and instruction. To meet this need, the certificate includes coursework with the twofold purpose of (1) helping instructors become literate in the field of data science by understanding the role data science experts play in improving the performance of institutions, organizations, business, and society; and (2) teaching instructors how to teach the practice of data science in their own classrooms, regardless of subject.

\_\_\_\_\_  
**Institutional Contact Signature**

\_\_\_\_\_  
**Date**

\_\_\_\_\_  
**Chief Academic Officer Signature**

\_\_\_\_\_  
**Date**

\*Certificate programs added to the Academic Program Inventory must be credit-bearing and be vocational in nature with some professional benefit to program completers. Undergraduate certificates are eligible for Title IV financial aid programs. Certificate programs that are not credit-bearing or are lifelong learning in nature (i.e. photography, travel, etc.) with no professional component should not be included in the Academic Program Inventory.





**MISSISSIPPI STATE**  
UNIVERSITY™

**Office of the Provost and  
Executive Vice President**

P.O. Box BQ  
3500 Lee Hall  
Mississippi State, MS 39762

P. 662.325.3742  
F. 662.325.4039

March 7, 2022

University Committee on Courses and Curricula  
PO Box 5268  
Mississippi State, MS 39762


Dear Committee:


The Data Science Pedagogy Graduate Certificate committee supports the attached proposal for a new certificate program.

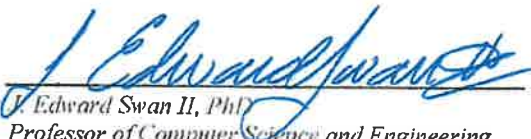
Please feel free to contact us if there are any questions or concerns.

Sincerely,

  
\_\_\_\_\_  
*Jonathan Barlow, PhD*  
*Associate Director for Architecture and Development*  
*NSPARC*

  
\_\_\_\_\_  
*Andy D. Perkins, PhD*  
*Associate Department Head*  
*Professor of Computer Science and Engineering*

  
\_\_\_\_\_  
*Dana Pomykal Franz, PhD*  
*Director of Academic Quality*  
*Professor of Mathematics Education*

  
\_\_\_\_\_  
*J. Edward Swan II, PhD*  
*Professor of Computer Science and Engineering*



MISSISSIPPI STATE UNIVERSITY  
JAMES WORTH  
**BAGLEY**  
COLLEGE OF ENGINEERING

**DEPARTMENT OF  
COMPUTER SCIENCE & ENGINEERING**

Dr.T.J. Jankun-Kelly  
Associate Professor & Graduate Coordinator  
tjk@cse.msstate.edu

March 3, 2022

Dr. Andy Perkins  
Chair  
UCCC

Dr. Perkins,

I write this letter in support of the proposed Graduate Certificate in Data Science Education. In consultation with the course instructor and Department head, the Department of Computer Science and Engineering supports allowing CSE 8423 Data Science: Concepts & Practice be used as a required course in the program. We anticipate five (5) students per year based upon this program from the online campus.

Sincerely yours,

Dr. T.J. Jankun-Kelly  
*Associate Professor and Director of Graduate Studies*

APPROVAL FORM FOR  
**DEGREE PROGRAMS**  
MISSISSIPPI STATE UNIVERSITY

**NOTE:** This form is a cover sheet that must accompany the degree program change proposal. The actual proposal should be prepared in accordance with format requirements provided in the *Guide and Format for Curriculum Proposals* published by the UCCC. Both cover sheet and proposal should be submitted to UCCC Mail Stop 9702 (281 Garner Hall), Phone: 325-9410.

**College:** College of Ag and Life Sciences      **Department:** Food Science, Nutrition, and Health Promotion (FSNHP)

**Contact Person:** Mandy Conrad      **Mail Stop:** 9805    **E-mail:** agc8@msstate.edu

**Nature of Change:** Degree Program Mod.      **Date Initiated:** 12/21    **Effective Date:** 6/22

**Current Degree Program Name:**

**Major:** Food Science, Nutrition and Health Promotion, Concentration: Food and Nutrition

**New Degree Program Name:** No Change

**Major:** No Change

**Concentration:** No Change

**Summary of Proposed Changes:**

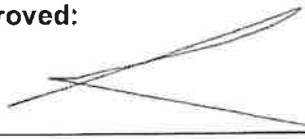
- The purpose of the proposed program modification is related to the program's status as an accredited Didactic Program in Dietetics (DPD) through the Accreditation Council for Education in Nutrition and Dietetics (ACEND), the accrediting agency for programs preparing students for careers as Registered Dietitians. New 2022 DPD Accreditation Standards were released in September 2021 and will go into effect June 1, 2022. To comply with the updated standards and prepare students to meet knowledge requirements and professional competencies for future practice in dietetics, the Food and Nutrition Concentration was reviewed and revised resulting in the following degree program changes.
- **Degree Program Changes FSNHP – Food and Nutrition Concentration:**
- Course addition FNH 2201 Nutrition and Dietetics Career Planning
- Course addition FNH 4323 Professional Skills for Nutrition and Dietetics
- Course modification FNH 4123
  - Course title change
  - Add Campus 5 Delivery
- Course modification FNH 4233
  - Course title change
  - Add Campus 5 Delivery
- Concentration hours increased
  - Current curriculum 60 hours
  - Proposed curriculum 62 hours (MGT 3114 changed to MGT 3113; FNH 4323 added (net = + 2 credits)

- FNH 2201 replaces current FNH 3701
- Free elective hours decreased
  - Current curriculum 8 hours of free elective
  - Proposed curriculum 6 hours of free elective
  - Total degree hours remain 124 credits

The two added courses (FNH 2201 Nutrition and Dietetics Career Planning, FNH 4323 Professional Skills for Nutrition and Dietetics) will be required concentration courses. The two modified courses (FNH 4123, FNH 4233) will remain required concentration courses. The FNH 3701 NTR Professional Develop course will no longer be required. Students will benefit from the degree program changes, which are required meet the 2022 Standards and maintain DPD accreditation. Specifically, the added course focuses on a new standard domain for "Leadership and Career Management: Skills, strengths, knowledge and experience relevant to leadership potential and professional growth for nutrition and dietetic practitioners." Students will also benefit from two course title changes that are consistent with course titles used in other DPD curriculum and emphasize course sequencing and linear progression, which supports better learning outcomes. Last, expanding delivery to Campus 5 will allow more flexibility in scheduling and outreach to traditional and non-traditional students.

Approved:

Date:



1/12/22

Department Head



2/28/2022

Chair, College or School Curriculum Committee

Lev L. (for STW)

3/07/2022

Dean of College or School



5/2/2022

Chair, University Committee on Courses and Curricula

Chair, Graduate Council(if applicable)



12<sup>th</sup> May, 2022

Chair, Deans Council

### DEGREE MODIFICATION OUTLINE FORM

Use the chart below to make modifications to an existing undergraduate degree outline. If any General Education (Core) course is acceptable in the category, please indicate by saying "any Gen Ed course". There is no need to type in the whole list. All deleted courses and information should be shown in *italics* and all new courses and information in **bold**. Include the course prefix, number, and title in both columns. Expand this table as needed.

CURRENT Degree Description		PROPOSED Degree Description	
Degree: Bachelor of Science Major: Food Science, Nutrition, and Health Promotion Concentration: Food and Nutrition		Degree: Bachelor of Science Major: Food Science, Nutrition, and Health Promotion Concentration: Food and Nutrition	
The Food Science, Nutrition and Health Promotion major offers the opportunity to gain a broad education in food science, nutrition, and health, as well as the specific academic background to pursue careers as food scientists and dietitians/nutritionists. It involves the integration of new knowledge and advances in technology and the physical and biological sciences with psychological, sociological, and behavioral sciences in the provision of a safe, nutritious food supply. Research, teaching, and outreach extend the continuum from the processing of food to its marketing, consumption, and impact on public health and community.		The Food Science, Nutrition and Health Promotion major offers the opportunity to gain a broad education in food science, nutrition, and health, as well as the specific academic background to pursue careers as food scientists and dietitians/nutritionists. It involves the integration of new knowledge and advances in technology and the physical and biological sciences with psychological, sociological, and behavioral sciences in the provision of a safe, nutritious food supply. Research, teaching, and outreach extend the continuum from the processing of food to its marketing, consumption, and impact on public health and community.	
The Food and Nutrition concentration in the Food Science, Nutrition, and Health Promotion major is accredited by the Accreditation Council for Education in Nutrition and Dietetics (ACEND) of the Academy of Nutrition and Dietetics (formerly the American Dietetic Association (ADA)) as a Didactic Program in Dietetics (DPD). Successful completion of the bachelor's degree in the Nutrition concentration at MSU qualifies students to compete for placement in ACEND-accredited supervised practice programs (most commonly dietetic internships), which are a required <i>next</i> step toward earning the Registered Dietician/Nutritionist (RDN) credential.		The Food and Nutrition concentration in the Food Science, Nutrition, and Health Promotion major is accredited by the Accreditation Council for Education in Nutrition and Dietetics (ACEND) of the Academy of Nutrition and Dietetics (formerly the American Dietetic Association (ADA)) as a Didactic Program in Dietetics (DPD). Successful completion of the bachelor's degree in the <b>Food and Nutrition</b> concentration at MSU qualifies students to compete for placement in ACEND-accredited supervised practice programs (most commonly dietetic internships), which are a required step toward earning the <b>Registered Dietitian Nutritionist (RDN)</b> credential.	
CURRENT CURRICULUM OUTLINE	Required Hours	PROPOSED CURRICULUM OUTLINE	Required Hours
English (Ex: EN 1103 English Comp I):  EN 1103 English Comp I OR EN 1104 Accelerated Comp I  EN 1113 English Comp II OR EN 1173 Accelerated Comp II	6	English (Ex: EN 1103 English Comp I):  EN 1103 English Comp I OR EN 1104 Accelerated Comp 1  EN 1113 English Comp II OR EN 1173 Accelerated Comp II	6
Fine Arts (General Education): Any Gen Ed Course	3	Fine Arts (General Education): Any Gen Ed Course	3
Natural Sciences  BIO 3304 Gen Microbiology  CH 1211 Investigations in Chemistry I	12	Natural Sciences  BIO 3304 Gen Microbiology  CH 1211 Investigations in Chemistry I	12

CH 1213 Chemistry I CH 1221 Investigations of Chemistry II CH 1223 Chemistry II Extra Science (if appropriate)		CH 1213 Chemistry I CH 1221 Investigations of Chemistry II CH 1223 Chemistry II Extra Science (if appropriate)	
Math (General Education):  MA 1313 College Algebra OR MA 1713 Calculus I OR MA 1613 Cal Bus & Life Sc I OR MA1463 Fin Ma & Intro Cal  ST 2113 Introduction to Statistics OR BQA 2113 Bus Stat Methods I OR ST 3123 Into to Stat. Inf.	6	Math (General Education):  MA 1313 College Algebra OR <b>MA 1103 College Algebra Co-req</b> OR MA 1713 Calculus I OR MA 1613 Cal Bus & Life Sc I  ST 2113 Introduction to Statistics OR BQA 2113 Bus Stat Methods I OR ST 3123 Into to Stat. Inf.	6
Humanities (General Education): Any Gen Ed Courses	6	Humanities (General Education): Any Gen Ed Courses	6
Social/Behavioral Sciences (Gen Ed):  PSY 1013 Gen Psychology  SO 1003 Intro to Sociology OR SO 1103 Contemporary Social Problems OR SO 1203 Sociology of Families	6	Social/Behavioral Sciences (Gen Ed):  PSY 1013 Gen Psychology  SO 1003 Intro to Sociology OR SO 1103 Contemporary Social Problems OR SO 1203 Sociology of Families	6
Major Core Courses:  CH 2501 Elem Org Chem Lab OR CH 4511 Organic Chem Lab I  CH 2503 Elem Org Chem OR CH 4513 Organic Chem I  FNH 2293 Individual and Family Nutrition  FNH 3111 FNH Seminar  FNH 4243 Food Composition and Reactions  MGT 3513 Intro to Human Resource Management  CO 1003 Fundamentals of Public Speaking OR CO 1013 Introduction to Communication OR CO 2213 Small Group Communication OR Co 3213 Small Group Communication	17	Major Core Courses:  CH 2501 Elem Org Chem Lab OR CH 4511 Organic Chem Lab I  CH 2503 Elem Org Chem OR CH 4513 Organic Chem I  FNH 2293 Individual and Family Nutrition  FNH 3111 FNH Seminar  FNH 4243 Food Composition and Reactions  MGT 3513 Intro to Human Resource Management  CO 1003 Fundamentals of Public Speaking OR CO 1013 Introduction to Communication OR CO 2213 Small Group Communication OR CO 3213 Small Group Communication	17
Concentration Courses:  BCH 4013 Principles of Biochemistry  BIO 1134 Biology I  BIO 3004 Human Anatomy	60	Concentration Courses:  BCH 4013 Principles of Biochemistry  BIO 1134 Biology I  BIO 3004 Human Anatomy	<b>62</b>

BIO 3014 Human Physiology FNH 2203 Science of FoodPrep FNH 3283 The Foodservice System <i>FNH 3701 NTR Professional Develop</i> FNH 3723 Community Nutrition FNH 4013 Nutrition Assessment FNH 4123 <i>Nutrition and Chronic Disease</i> FNH 4233 <i>Medical Nutrition Therapy</i> FNH 4253 Macronutrients FNH 4284 Quantity Food Prod & Serv FNH 4293 Micronutrients FNH 4353 Nutrition/ Life Cycle FNH 4373 NTR Ed & Counsel Skill FNH 4363 Research Methods in Fd & Ntr KI 2603 Medical Terminology MGT 3113 Prin of Mgmt		BIO 3014 Human Physiology FNH 2203 Science of FoodPrep FNH 3283 The Foodservice System <b>FNH 2201 Nutrition and Dietetics Career Planning</b> FNH 3723 Community Nutrition FNH 4013 Nutrition Assessment FNH 4123 <b>Medical Nutrition Therapy I</b> FNH 4233 <b>Medical Nutrition Therapy II</b> FNH 4253 Macronutrients FNH 4284 Quantity Food Prod & Serv FNH 4293 Micronutrients FNH 4353 Nutrition/ Life Cycle FNH 4373 NTR Ed & Counsel Skill FNH 4363 Research Methods in Fd & Ntr KI 2603 Medical Terminology MGT 3113 Prin of Mgt & Prod <b>FNH 4323 Professional Skills for Nutrition and Dietetics</b>	
Electives Free Electives	8	Electives Free Electives	6
Total Hours	124	Total Hours	124
CURRENT DEGREE		PROPOSED DEGREE	
Degree: Bachelor of Science Major: Food Science, Nutrition, and Health Promotion Concentration: Food Processing and Business		No change	
CURRENT Degree Description		PROPOSED DEGREE	
Degree: Bachelor of Science Major: Food Science, Nutrition, and Health Promotion Concentration: Food Science		No Change	
CURRENT Degree Description		PROPOSED DEGREE	
Degree: Bachelor of Science Major: Food Science, Nutrition, and Health Promotion Concentration: Food Safety		No Change	
CURRENT Degree Description		PROPOSED DEGREE	
Degree: Bachelor of Science		No Change	

Major: Food Science, Nutrition, and Health Promotion Concentration: Pre-Health			





**MISSISSIPPI STATE**  
UNIVERSITY.

DEPARTMENT OF FOOD SCIENCE, NUTRITION  
AND HEALTH PROMOTION  
P. O. Box 9805  
Mississippi State, MS 39762  
P. 662.325.3200  
fsnhp.msstate.edu

Date: January 10<sup>th</sup>, 2022

To: Dr. Ashli Brown, Department Head  
From: Dr. Wes Schilling, Curriculum Committee Chair

Re: Food and Nutrition Concentration Modification

Dear Dr. Brown,

This letter serves as verification that the Curriculum Committee has approved the Program Modification for the Food and Nutrition Concentration within the Bachelor of Science degree in Food Science, Nutrition, and Health Promotion. These individual modifications include

1. The deletion of FNH 3701
2. Addition FNH 2201 Nutrition and Dietetics Career Planning
3. Modification of FNH 4123 Nutrition and Chronic disease to FNH 4123 Medical Nutrition Therapy I
4. Modification of FNH 4233 Medical Nutrition Therapy to FNH 4233 Medical Nutrition Therapy II
5. Addition of FNH 4323 Professional Skills for Nutrition and Dietetics

This program modification and specific course modifications, additions, and deletions were voted on by departmental Nutrition faculty and was approved by a vote of 6 yes votes and 0 no votes.

Sincerely,

Wes Schilling, PhD  
Chair

Wen-Hsing Cheng, PhD  
Committee Member

Terezie Tolar-Peterson, EdD  
Committee Member

Antonio Gardner, PhD  
Committee Member

Leah Pyllate, PhD  
Committee Member

Shecoya White, PhD  
Committee Member

APPROVAL FORM FOR  
**DEGREE PROGRAMS**  
MISSISSIPPI STATE UNIVERSITY

**NOTE:** This form is a cover sheet that must accompany the degree program change proposal. The actual proposal should be prepared in accordance with format requirements provided in the *Guide and Format for Curriculum Proposals* published by the UCCC. Both cover sheet and proposal should be submitted to UCCC Mail Stop 9702 (281 Garner Hall), Phone: 325-9410.

**College:** College of Ag and Life Sciences    **Department:** Plant and Soil Sciences


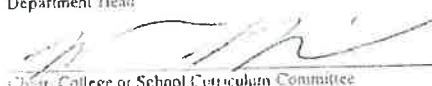

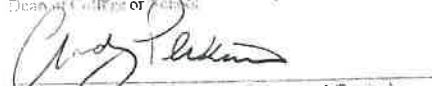


**Contact Person:** Richard Harkess    **Mail Stop:** 9555    **E-mail:** richard.harkess@msstate.edu

**Nature of Change:** Add Distance Education option to the existing degree program.  
**Date Initiated:** 7/14/21    **Effective Date:** Fall 2022

**Current Degree Program Name:** Master of Science  
**Major:** Plant and Soil Sciences    **Concentration:** Agronomy, Horticulture, Weed Science

**New Degree Program Name:** Master of Science  
**Major:** Plant and Soil Sciences    **Concentration:** Agronomy, Horticulture, Weed Science

**Summary of Proposed Changes:**  
Add distance education option to the Master of Science Plant and Soil Sciences degree program.

Approved:	Date:
 Department Head	2/21/2022
 Chair, College or School Curriculum Committee	2/25/2022
 Dean of College or School	3/3/2022
 Chair, University Committee on Courses and Curricula	3/30/22
 Chair, Graduate Council (if applicable)	4/1/2022
 Chair, Deans Council	12 <sup>th</sup> May, 2022

**Proposal for an Existing Degree Program to be offered through Distance Education  
Master of Science – Plant and Soil Sciences**

**1. CATALOG DESCRIPTION**

Graduate study offered in the Department of Plant and Soil Sciences leads to the Master of Science in Plant and Soil Sciences degree with concentrations in Agronomy, Horticulture, or Weed Science and the Doctor of Philosophy degree in Plant and Soil Sciences with a concentration in Agronomy, Horticulture, or Weed Science. The Horticulture concentration within the Plant and Soil Sciences degrees also offers a minor in Floral Management. The department has an extensive research program which provides a diversity of problems for thesis and dissertation research under the supervision of experienced and highly trained scientists. The Department of Plant and Soil Sciences offers graduate programs in Plant Breeding and Genetics, Molecular Biology, Crop Modeling, Agronomy, Soil Science, Crop Physiology, Weed Science, Turfgrass Science, Remote Sensing, and Horticulture. A Precision Agriculture Certificate is also offered.

Graduate programs are designed to develop skills in research techniques in reference to the individual needs of each student. This program is developed and administered by a departmental committee within the student's area of specialization and may include courses in mathematics and statistics, biology, chemistry, biochemistry, remote sensing, etc., as well as agronomic, horticultural, and weed science courses. Graduate assistantships are provided, subject to availability of funds. An undergraduate grade average of B or better is required to be eligible for an assistantship. Requests for additional information should be addressed to:

Department Head  
Plant and Soil Sciences  
Box 9555  
Mississippi State, MS 39762

**2. GRADUATE DEGREE MODIFICATION OUTLINE FORM**

All deleted courses and information are shown in *italics* and all new courses and information in **bold**.

CURRENT Degree Description	PROPOSED Degree Description
Degree: Master of Science Major: Plant and Soil Sciences Concentrations: Agronomy; Horticulture; Weed Science	Degree: Master of Science Major: Plant and Soil Sciences Concentrations: Agronomy; Horticulture; Weed Science
Graduate study offered in the Department of Plant and Soil Sciences leads to the Master of Science in Plant and Soil Sciences degree with concentrations in Agronomy, Horticulture, or Weed Science and <i>also to</i> the Doctor of Philosophy degree in Plant and Soil Sciences with	Graduate study offered in the Department of Plant and Soil Sciences leads to the Master of Science in Plant and Soil Sciences degree with concentrations in Agronomy, Horticulture, or Weed Science and the Doctor of Philosophy degree in Plant and Soil Sciences with a

a concentration in Agronomy, Horticulture, or Weed Science. The Horticulture concentration within the Plant and Soil Sciences degrees also offers a minor in Floral Management. The department has an extensive research program which provides a diversity of problems for thesis and dissertation research under the supervision of experienced and highly trained scientists. The Department of Plant and Soil Sciences offers graduate programs in Plant Breeding and Genetics, Molecular Biology, Crop Modeling, Agronomy, Soil Science, Crop Physiology, Weed Science, Turfgrass Science, Remote Sensing, and Horticulture. A Precision Agriculture Certificate is also offered.

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concentration in Agronomy, Horticulture, or Weed Science. The Horticulture concentration within the Plant and Soil Sciences degrees also offers a minor in Floral Management. The department has an extensive research program which provides a diversity of problems for thesis and dissertation research under the supervision of experienced and highly trained scientists. The Department of Plant and Soil Sciences offers graduate programs in Plant Breeding and Genetics, Molecular Biology, Crop Modeling, Agronomy, Soil Science, Crop Physiology, Weed Science, Turfgrass Science, Remote Sensing, and Horticulture. A Precision Agriculture Certificate is also offered.

Graduate programs are designed to develop skills in research techniques in reference to the individual needs of each student. This program is developed and administered by a departmental committee within the student's area of specialization and may include courses in mathematics and statistics, biology, chemistry, biochemistry, remote sensing, etc., as well as agronomic, horticultural, and weed science courses. Graduate assistantships are provided, subject to availability of funds. An undergraduate grade average of B or better is required to be eligible for an assistantship. Requests for additional information should be addressed to:

Department Head  
 Plant and Soil Sciences  
 Box 9555  
 Mississippi State, MS 39762

<b>CURRENT CURRICULUM OUTLINE</b>	Required Hours	<b>PROPOSED CURRICULUM OUTLINE</b>	Required Hours
College Required Courses No college required courses	0	College Required Courses No college required courses	0
Major Required Courses  Graduate level coursework PSS 8811 Seminar <sup>1</sup> ST 8114 Statistical Methods (or other graduate level statistics course) <sup>2</sup>	12 1 4	Major Required Courses  Graduate level coursework PSS 8811 Seminar <sup>1</sup> ST 8114 Statistical Methods (or other graduate level statistics course) <sup>2</sup>	12 1 4

<p><sup>1</sup>An exit seminar describing the thesis research is required as part of the credit hours.</p> <p><sup>2</sup>A graduate-level statistics course is required as part of the credit hours.</p> <p>Students in the Master of Science in Plants and Soils degree program will be required to complete the following before earning their degree.</p> <p>M.S. – Thesis — Students must complete a minimum number of 30 credit hours with 12 credit hours at 8000 level or above plus 6 hours of research/thesis A graduate level statistics course and an exit seminar (PSS 8811) describing the thesis research are required as part of the credit hours. A thesis and an oral thesis defense are required. The graduate committee must approve the thesis topic, research proposal, program of study and final thesis.</p> <p>M.S. - Non-thesis—A student in the M.S. non-thesis option program must successfully complete 30 credit hours of graduate level courses of which at least 15 must be courses numbered 8000 or above. <i>Three credit hours of Directed Individual Study (PSS 7000) are required, in which the student must develop a research paper approved by the student's graduate committee.</i> An oral comprehensive exam is required.</p>		<p><sup>1</sup>An exit seminar describing the thesis research <b>or non-thesis paper</b> is required as part of the credit hours.</p> <p><sup>2</sup>A graduate-level statistics course is required as part of the credit hours.</p> <p>Students in the Master of Science in Plants and Soils degree program will be required to complete the following before earning their degree.</p> <p>M.S. – Thesis — Students must complete a minimum number of 30 credit hours with 12 credit hours at 8000 level or above plus 6 hours of research/thesis A graduate level statistics course and an exit seminar (PSS 8811) describing the thesis research are required as part of the credit hours. A thesis and an oral thesis defense are required. The graduate committee must approve the thesis topic, research proposal, program of study and final thesis.</p> <p>M.S. - Non-thesis—A student in the M.S. non-thesis option program must successfully complete 30 credit hours of graduate level courses of which at least 15 must be courses numbered 8000 or above. An oral comprehensive exam is required.</p>	
<p>Concentration 1. Agronomy – Thesis</p> <p>8000-level coursework<sup>1</sup> <i>PSS 800x Research/Thesis</i><sup>2</sup></p> <p><sup>1</sup>The total 8000-level coursework credits must equal a minimum of 12 hours.</p>	<p>7 6</p>	<p>Concentration 1. Agronomy – Thesis</p> <p>8000-level coursework<sup>1</sup> <b>PSS 8000 Research/Thesis</b><sup>2</sup></p> <p><sup>1</sup>The total 8000-level coursework credits must equal a minimum of 12 hours.</p>	<p>7 6</p>

<sup>2</sup> A thesis defense is required.		<sup>2</sup> A thesis defense is required.	
Concentration 1. Agronomy – Non-Thesis  PSS 7000 Dir. Indiv. Study PSS <sup>1</sup> 8000-level coursework <sup>2</sup>  <sup>1</sup> The student must develop a research paper approved by the student's graduate committee. In addition, a comprehensive examination over coursework is required.  <sup>2</sup> The total 8000-level coursework credits must equal a minimum of 15 hours.	3 10	Concentration 1. Agronomy – Non-Thesis  PSS 7000 Dir. Indiv. Study PSS <sup>1</sup> 8000-level coursework <sup>2</sup>  <sup>1</sup> The student must develop a research paper approved by the student's graduate committee. In addition, a comprehensive examination over coursework is required.  <sup>2</sup> The total 8000-level coursework credits must equal a minimum of 15 hours.	3 10
Concentration 2. Horticulture – Thesis  8000-level coursework <sup>1</sup> <i>PSS 800x Research/Thesis</i> <sup>2</sup>  <sup>1</sup> The total 8000-level coursework credits must equal a minimum of 12 hours.  <sup>2</sup> A thesis defense is required.	7 6	Concentration 2. Horticulture – Thesis  8000-level coursework <sup>1</sup> <b>PSS 8000 Research/Thesis</b> <sup>2</sup>  <sup>1</sup> The total 8000-level coursework credits must equal a minimum of 12 hours.  <sup>2</sup> A thesis defense is required.	7 6
Concentration 2. Horticulture – Non-Thesis  PSS 7000 Dir. Indiv. Study PSS <sup>1</sup> 8000-level coursework <sup>2</sup>  <sup>1</sup> The student must develop a research paper approved by the student's graduate committee. In addition, a comprehensive examination over coursework is required.  <sup>2</sup> The total 8000-level coursework credits must equal a minimum of 15 hours.	3 10	Concentration 2. Horticulture – Non-Thesis  PSS 7000 Dir. Indiv. Study PSS <sup>1</sup> 8000-level coursework <sup>2</sup>  <sup>1</sup> The student must develop a research paper approved by the student's graduate committee. In addition, a comprehensive examination over coursework is required.  <sup>2</sup> The total 8000-level coursework credits must equal a minimum of 15 hours.	3 10
Concentration 3. Weed Science – Thesis		Concentration 3. Weed Science – Thesis	

8000-level coursework <sup>1</sup> <i>PSS 800x Research/Thesis</i> <sup>2</sup>	7 6	8000-level coursework <sup>1</sup> <b>PSS 8000 Research/Thesis</b> <sup>2</sup>	7 6
<sup>1</sup> The total 8000-level coursework credits must equal a minimum of 12 hours.		<sup>1</sup> The total 8000-level coursework credits must equal a minimum of 12 hours.	
<sup>2</sup> A thesis defense is required.		<sup>2</sup> A thesis defense is required.	
Concentration 3. Weed Science – Non- Thesis		Concentration 3. Weed Science – Non- Thesis	
PSS 7000 Dir. Individ. Study PSS <sup>1</sup> 8000-level coursework <sup>2</sup>	3 10	PSS 7000 Dir. Individ. Study PSS <sup>1</sup> 8000-level coursework <sup>2</sup>	3 10
<sup>1</sup> The student must develop a research paper approved by the student's graduate committee. In addition, a comprehensive examination over coursework is required.		<sup>1</sup> The student must develop a research paper approved by the student's graduate committee. In addition, a comprehensive examination over coursework is required.	
<sup>2</sup> The total 8000-level coursework credits must equal a minimum of 15 hours.		<sup>2</sup> The total 8000-level coursework credits must equal a minimum of 15 hours.	
Total Hours	30	Total Hours	30

### 3. JUSTIFICATION FOR DISTANCE LEARNING OFFERING

Adding a distance education option (campus 5) will open the possibility of reaching a greater number of students needing an advanced degree in Plant Sciences. It will provide flexibility to meet emerging graduate student needs and reach a larger audience. Adding distance education option will make the PSS program accessible to professionals who live away from campus as well as individuals who travel frequently or who may not have access or ability to travel to campus to pursue a graduate degree.

#### TARGET AUDIENCE

The target audience for the online PSS MS degree is those students who currently work in the field and desire professional development and career advancement opportunities. It includes non-traditional students and/or early/mid-career individuals seeking a terminal degree by distance learning. Specific target audience examples include; non-traditional students, Extension agents/personnel, early/mid-career individuals in agricultural industries, military personnel, and State/Federal employees.

The following courses have been approved for online instruction (either Campus 1 or/and Campus 5) providing a path to obtain the degree online. The department also participates in a course share MOA (ACCEPTS) with three other universities in which the courses are

offered online Campus 1 at Mississippi State University. PSS will add the Campus 5 option to additional courses as the program grows.

The following are PSS courses offered online.

PSS 6013 Prin. Floral Design II (**Campus 5 proposal submitted**)  
PSS 6023 Floral Management (Campus 1 online)  
PSS 6033 Case Studies in Floral Management (Campus 1 online)  
PSS 6043 International Horticulture (Campus 1 online, ACCEPtS)  
PSS 6113 Agricultural Crop Physiology (Campus 1 online, ACCEPtS)  
PSS 6153 Sustainable Agroecology (Campus 1 online, ACCEPtS)  
PSS 6313 Soil Fertility and Fertilizers (Campus 5)  
PSS 6333 Soil Conservation and Land Use (Campus 1 online & 5)  
PSS 6341 Controlled Environment Agriculture Laboratory (Campus 1 online, ACCEPtS)  
PSS 6343 Controlled Environment Agriculture (Campus 1 online, ACCEPtS)  
PSS 6363 Sustainable Nursery Production (Campus 1 online, ACCEPtS)  
PSS 6383 Agriculture Remote Sensing I (Campus 1 online)  
PSS 6443 Athletic Field Mgmt (Campus 1 online, ACCEPtS; **Campus 5 submitted**)  
PSS 6453 Vegetable Production (**Campus 5 proposal submitted**)  
PSS 6473 Hydroponic and Soilless Crop Production (**Campus 5 proposal submitted**)  
PSS 6483 Intro. To Remote Sensing Technologies (Campus 5)  
PSS 6553 Plant Growth and Development (Campus 1 online, ACCEPtS)  
PSS 6603 Soil Chemistry (Campus 5)  
PSS 6833 Temperature Stress Physiology (Campus 1 online, ACCEPtS)  
PSS 7000 Directed Individual Study (Campus 5)  
PSS 8012 Thesis Proposal Writing (Campus 1 online)  
PSS 8103 Pasture Development (Campus 5)  
PSS 8123 Crop Ecology (Campus 5)  
PSS 8333 Advanced Soil Fertility (Campus 5)  
PSS 8343 Soil Plant Atmosphere Relationships (Campus 5)  
PSS 8553 Phytohormones and Growth Regulation (**Campus 5 proposal submitted**)

The following Statistics courses have been approved for Campus 5 and may satisfy the Graduate Statistics requirements if offered.

ST 8114 Statistical Methods (Campus 5)  
ST 8123 Statistical Thinking: Prob. Models & Theory of Stats (Campus 5)  
ST 8253 Regression Analysis (Campus 5)

4. LEARNING OUTCOMES (No change from current program and will be the same for in-person and online students)

Expected Learning Outcomes

1. Students will be able to demonstrate a broad-based knowledge in their respective discipline.
2. Students will demonstrate a broad-based knowledge related to identification and management of issues in Mississippi and how these relate to issues regionally and globally within their respective discipline.
3. Students will know and understand current trends and important issues within



- their respective discipline.
4. Students will have a working knowledge of research methodology, experimental design, data management and interpretation.
  5. Students will be able to communicate effectively with clientele and peers in their disciplines.
5. EFFECTIVE DATE  
Spring 2022
6. CONTACT PERSON  
Richard L. Harkess  
662-325-4556  
[richard.harkess@msstate.edu](mailto:richard.harkess@msstate.edu)
7. SUPPORT  
A letter of support is included from the Department of Plant and Soil Sciences Courses and Curriculum Committee.



**MISSISSIPPI STATE**  
UNIVERSITY

**COLLEGE OF AGRICULTURE & LIFE SCIENCES**  
Department of Plant and Soil Sciences

117 Dorman Hall, Box 9555  
32 Creelman Street  
Mississippi State, MS 39762

P. 662.325.2311  
F. 662.325.8742

[www.pss.msstate.edu](http://www.pss.msstate.edu)

24 January 2022

University Courses & Curriculum Committee

Andy Perkins, Chair

281 Garner Hall;

Post Office Box 5268

Mailstop: 9702

Mississippi State, MS 39762

UCCC:

The PSS CCC met as a committee to discuss the proposed addition of Campus 5 Distance Education to our Masters and Doctorate degree programs. After review and discussion with the committee and input from department faculty, the PSS Curriculum Committee voted unanimously to support the addition of the Campus 5 Distance Education degree programs. The committee determined the addition of Distance Education degree option reflects current teaching practices, is relevant to student needs, and will fulfill department constituent needs. These programs do not represent a duplication of effort from other programs offered at Mississippi State University.

Sincerely,

**Richard L Harkess**

Richard L. Harkess, Chair

Plant and Soil Sciences Courses & Curriculum Committee

PSS CCCCommittee:

**Michael Cox**

Michael Cox

**William**

William Kingery

**Fred Musser**

Fred Musser

**Cole Etheredge**

Cole Etheredge

**David Lang**

David Lang

**Barry Stewart**

Barry Stewart

**Darrin M. Dodds**

Darrin Dodds, Dept. Head, PSS

c: Cindy Williams, Administrative Assistant

Signature: Michael Cox  
Michael Cox (Jan 24, 2022 12:42 CST)  
Email: msc15@msstate.edu

Signature: Fred Musser  
Fred Musser (Jan 31, 2022 11:05 CST)  
Email: fm61@msstate.edu

Signature: David Lang  
David J. Lang (Feb 1, 2022 11:11 CST)  
Email: dlang@pss.msstate.edu

Signature: Darrin M. Dadds  
Darrin M. Dadds (Feb 1, 2022 11:31 CST)  
Email: dmd76@msstate.edu

Signature: William Kingery  
William Kingery (Jan 27, 2022 11:21 CST)  
Email: wlk2@msstate.edu

Signature: Coleman Etheredge  
Coleman Etheredge (Feb 1, 2022 08:07 CST)  
Email: cle248@msstate.edu

Signature: Barry Stewart  
Barry Stewart (Feb 1, 2022 11:20 CST)  
Email: brs40@msstate.edu

Signature: Richard L. Hickey  
Email: rlh18@msstate.edu










# PSS CCC Support letter Online Grad Degree Programs


Final Audit Report


2022-02-01

Created:	2022-01-24
By:	Richard Harkess (rharkess@pss.msstate.edu)
Status:	Signed
Transaction ID:	CBJCHBCAABAABAWHrJSJi6_YYeGOK4-B99maMZVPIWyG1R


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Signature Date: 2022-02-01 - 5:11:15 PM GMT - Time Source: server- IP address: 130.18.201.189

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**Appendix 10: Report of Intent to Offer an Existing Degree Program by Distance Learning**  
(Submit Appendix 10 in PDF format with signatures)

Institution: Mississippi State University

Date of Initial Program Approval:                      Date of Implementation:                      Cost to Offer by Distance Learning:  
Fall 2015    Spring 2016    \$2,000

Program Title as It Appears on Academic Program Inventory, Diploma, and Transcript:                      Six-Digit CIP Code(s) &  
Four-Digit Sequence Code(s):  
Plant and Soil Sciences Master of Science    01.1101  
CIP & Sequence codes: III Active Program Inventory

Degree(s) to be Awarded:    Credit Hour Requirements:  
Master of Science    30

Can this program be completed entirely online?  Yes  No

Will this program require separate admission from those offered on-campus?  Yes  No

Responsible Academic Unit(s):    Institutional Contact: Dr. Darrin Dodds  
Department of Plant and Soil Sciences    Phone: 662-325-2698  
Email: dmd76@msstate.edu

Number of Students Expected to Enroll in First Six Years:		Number of Graduates Expected in First Six Years:	
Year One	4	Year One	0
Year Two	8	Year Two	4
Year Three	8	Year Three	8
Year Four	8	Year Four	8
Year Five	8	Year Five	8
Year Six	8	Year Six	8
Total	44	Total	36

**Program Summary:**

This degree modification will add the option of distance education. Students choosing this option will have the ability to complete their degree online under the supervision of graduate faculty in the department. An online option will open the degree program to a wider population seeking graduate education in the Plant and Soil Sciences and provide opportunity for industry/University collaboration.

  
\_\_\_\_\_  
Chief Academic Officer Signature

2-5-22  
\_\_\_\_\_  
Date

  
\_\_\_\_\_  
Institutional Executive Officer Signature

2-3-22  
\_\_\_\_\_  
Date

APPROVAL FORM FOR  
**DEGREE PROGRAMS**  
MISSISSIPPI STATE UNIVERSITY

**NOTE:** This form is a cover sheet that must accompany the degree program change proposal. The actual proposal should be prepared in accordance with format requirements provided in the *Guide and Format for Curriculum Proposals* published by the UCCC. Both cover sheet and proposal should be submitted to UCCC Mail Stop 9702 (281 Garner Hall), Phone: 325-9410.

**College:** College of Ag and Life Sciences    **Department:** Plant and Soil Sciences

**Contact Person:** Richard Harkess    **Mail Stop:** 9555    **E-mail:** richard.harkess@msstate.edu

**Nature of Change:** Add Distance Education option to existing degree program  
**Date Initiated:** 7/14/21    **Effective Date:** Fall 2022

**Current Degree Program Name:** Doctor of Philosophy

**Major:** Plant and Soil Sciences    **Concentration:** Agronomy, Horticulture, Weed Science

**New Degree Program Name:** Doctor of Philosophy

**Major:** Plant and Soil Sciences    **Concentration:** Agronomy, Horticulture, Weed Science

**Summary of Proposed Changes:**

Add distance education option to the Doctor of Philosophy Plant and Soil Sciences degree program and expand the biochemistry requirement in the Horticulture concentration.

Approved:

Date:

  
Department Head

2/21/2022

  
Chair, College or School Curriculum Committee

2/25/2022


  
Dean of College or School

3/3/2022

  
Chair, University Committee on Courses and Curricula

3/30/22

 4/1/2022  
Chair, Graduate Council (if applicable)

  
Chair, Deans Council

12<sup>th</sup> May, 2022

**Proposal for an Existing Degree Program to be offered through Distance Education  
Doctor of Philosophy – Plant and Soil Sciences**

**1. CATALOG DESCRIPTION**

Graduate study offered in the Department of Plant and Soil Sciences leads to the Master of Science in Plant and Soil Sciences degree with concentrations in Agronomy, Horticulture, or Weed Science and the Doctor of Philosophy degree in Plant and Soil Sciences with a concentration in Agronomy, Horticulture, or Weed Science. The Horticulture concentration within the Plant and Soil Sciences degrees also offers a minor in Floral Management. The department has an extensive research program which provides a diversity of problems for thesis and dissertation research under the supervision of experienced and highly trained scientists. The Department of Plant and Soil Sciences offers graduate programs in Plant Breeding and Genetics, Molecular Biology, Crop Modeling, Agronomy, Soil Science, Crop Physiology, Weed Science, Turfgrass Science, Remote Sensing, and Horticulture. A Precision Agriculture Certificate is also offered.

Graduate programs are designed to develop skills in research techniques in reference to the individual needs of each student. This program is developed and administered by a departmental committee within the student's area of specialization and may include courses in mathematics and statistics, biology, chemistry, biochemistry, remote sensing, etc., as well as agronomic, horticultural, and weed science courses. Graduate assistantships are provided, subject to availability of funds. An undergraduate grade average of B or better is required to be eligible for an assistantship. Requests for additional information should be addressed to:

Department Head  
Plant and Soil Sciences  
Box 9555  
Mississippi State, MS 39762

**2. GRADUATE DEGREE MODIFICATION OUTLINE FORM**

All deleted courses and information are shown in *italics* and all new courses and information in **bold**.

CURRENT Degree Description	PROPOSED Degree Description
Degree: Doctor of Philosophy Major: Plant and Soil Sciences Concentrations: Agronomy; Horticulture; Weed Science	Degree: Doctor of Philosophy Major: Plant and Soil Sciences Concentrations: Agronomy; Horticulture; Weed Science
(NO CHANGE) Graduate study offered in the Department of Plant and Soil Sciences leads to the Master of Science in Plant and Soil Sciences degree with concentrations in Agronomy, Horticulture, or Weed Science and <i>also to</i> the Doctor of	(NO CHANGE) Graduate study offered in the Department of Plant and Soil Sciences leads to the Master of Science in Plant and Soil Sciences degree with concentrations in Agronomy, Horticulture, or Weed Science and the Doctor of Philosophy



Philosophy degree in Plant and Soil Sciences with a concentration in Agronomy, Horticulture, or Weed Science. The Horticulture concentration within the Plant and Soil Sciences degrees also offers a minor in Floral Management. The department has an extensive research program which provides a diversity of problems for thesis and dissertation research under the supervision of experienced and highly trained scientists. The Department of Plant and Soil Sciences offers graduate programs in Plant Breeding and Genetics, Molecular Biology, Crop Modeling, Agronomy, Soil Science, Crop Physiology, Weed Science, Turfgrass Science, Remote Sensing, and Horticulture. A Precision Agriculture Certificate is also offered.

Graduate programs are designed to develop skills in research techniques in reference to the individual needs of each student. This program is developed and administered by a departmental committee within the student's area of specialization and may include courses in mathematics and statistics, biology, chemistry, biochemistry, remote sensing, etc., as well as agronomic, horticultural, and weed science courses. Graduate assistantships are provided, subject to availability of funds. An undergraduate grade average of B or better is required to be eligible for an assistantship. Requests for additional information should be addressed to:

Department Head  
 Plant and Soil Sciences  
 Box 9555  
 Mississippi State, MS 39762

degree in Plant and Soil Sciences with a concentration in Agronomy, Horticulture, or Weed Science. The Horticulture concentration within the Plant and Soil Sciences degrees also offers a minor in Floral Management. The department has an extensive research program which provides a diversity of problems for thesis and dissertation research under the supervision of experienced and highly trained scientists. The Department of Plant and Soil Sciences offers graduate programs in Plant Breeding and Genetics, Molecular Biology, Crop Modeling, Agronomy, Soil Science, Crop Physiology, Weed Science, Turfgrass Science, Remote Sensing, and Horticulture. A Precision Agriculture Certificate is also offered.

Graduate programs are designed to develop skills in research techniques in reference to the individual needs of each student. This program is developed and administered by a departmental committee within the student's area of specialization and may include courses in mathematics and statistics, biology, chemistry, biochemistry, remote sensing, etc., as well as agronomic, horticultural, and weed science courses. Graduate assistantships are provided, subject to availability of funds. An undergraduate grade average of B or better is required to be eligible for an assistantship. Requests for additional information should be addressed to:

Department Head  
 Plant and Soil Sciences  
 Box 9555  
 Mississippi State, MS 39762

<b>CURRENT CURRICULUM OUTLINE</b>		<b>PROPOSED CURRICULUM OUTLINE</b>	
	Required Hours		Required Hours
College Required Courses	0	College Required Courses	0
No college required courses		No college required courses	

<p>Major Required Courses</p> <p>PSS 8821 Seminar<sup>1</sup> PSS 8831 Seminar<sup>2</sup></p> <p>PSS 9000 Research/Dissertation<sup>3</sup></p> <p><sup>1</sup>The first seminar should be done within the first year of the student's program and should present the research proposal and include a review of relevant literature.</p> <p><sup>2</sup>An exit seminar will describe the results of the student's dissertation research.</p> <p><sup>3</sup>Mississippi State University requires all students earn at least 53 hours graduate credit beyond the bachelor's level to include a minimum of 20 dissertation credits.</p> <p>A qualifying examination may be administered at the beginning of the student's program. The student must successfully complete a program of study as approved by the major advisor and graduate committee. The student must pass a preliminary examination. a written and oral preliminary examination will be administered by the graduate committee after completion or within 6 hours of completing coursework. Original research and a dissertation are required of all candidates for the doctoral degree.</p>	<p>1</p> <p>1</p> <p>20</p>	<p>Major Required Courses</p> <p>PSS 8821 Seminar<sup>1</sup> PSS 8831 Seminar<sup>2</sup></p> <p>PSS 9000 Research/Dissertation<sup>3</sup></p> <p><sup>1</sup>The first seminar should be done within the first year of the student's program and should present the research proposal and include a review of relevant literature.</p> <p><sup>2</sup>An exit seminar will describe the results of the student's dissertation research.</p> <p><sup>3</sup>Mississippi State University requires all students earn at least 53 hours graduate credit beyond the bachelor's level to include a minimum of 20 dissertation credits.</p> <p>A qualifying examination may be administered at the beginning of the student's program. The student must successfully complete a program of study as approved by the major advisor and graduate committee. The student must pass a preliminary examination. a written and oral preliminary examination will be administered by the graduate committee after completion or within 6 hours of completing coursework. Original research and a dissertation are required of all candidates for the doctoral degree.</p>	<p>1</p> <p>1</p> <p>20</p>
<p>Concentration 1. Agronomy</p> <p>ST 8114 Statistical Methods (or other graduate level statistics course)<sup>1</sup> Additional graduate-level coursework<sup>2</sup></p>	<p>4</p> <p>14</p>	<p>Concentration 1. Agronomy</p> <p>ST 8114 Statistical Methods (or other graduate level statistics course)<sup>1</sup> Additional graduate-level coursework<sup>2</sup></p>	<p>4</p> <p>14</p>

<p><sup>1</sup>A graduate-level statistics course is required as part of the credit hours.</p> <p><sup>2</sup>The minimum coursework required for a PhD in Plant and Soil Sciences is 20 hours beyond the Master's degree requirements.</p>		<p><sup>1</sup>A graduate-level statistics course is required as part of the credit hours.</p> <p><sup>2</sup>The minimum coursework required for a PhD in Plant and Soil Sciences is 20 hours beyond the Master's degree requirements.</p>	
Total Hours – Agronomy	40	Total Hours – Agronomy	40
Concentration 2. Horticulture			
BCH 6013 Prin. Biochemistry	3	BCH 6013 Prin. Biochemistry (or other graduate level biochemistry course)	3
ST 8214 Design & Anal. Exp. (or other graduate level statistics course) <sup>1</sup>	4	ST 8214 Design & Anal. Exp. (or other graduate level statistics course) <sup>1</sup>	4
Additional graduate-level coursework <sup>2</sup>	15	Additional graduate-level coursework <sup>2</sup>	15
<p><sup>1</sup>A graduate-level statistics course is required as part of the credit hours.</p> <p><sup>2</sup>The minimum coursework required for a PhD in Plant and Soil Sciences with a Horticulture concentration is 24 hours beyond the Master's degree requirements.</p>		<p><sup>1</sup>A graduate-level statistics course is required as part of the credit hours.</p> <p><sup>2</sup>The minimum coursework required for a PhD in Plant and Soil Sciences with a Horticulture concentration is 24 hours beyond the Master's degree requirements.</p>	
Total Hours – Horticulture	44	Total Hours – Horticulture	44
Concentration 3. Weed Science			
ST 8114 Statistical Methods (or other graduate level statistics course) <sup>1</sup>	4	ST 8114 Statistical Methods (or other graduate level statistics course) <sup>1</sup>	4
Additional graduate-level coursework <sup>2</sup>	14	Additional graduate-level coursework <sup>2</sup>	14
<p><sup>1</sup>A graduate-level statistics course is required as part of the credit hours.</p> <p><sup>2</sup>The minimum coursework required for a PhD in Plant and Soil Sciences is 20 hours beyond the Master's degree requirements. Up to 9 hours of PSS 8701-8771 Current Topics</p>		<p><sup>1</sup>A graduate-level statistics course is required as part of the credit hours.</p> <p><sup>2</sup>The minimum coursework required for a PhD in Plant and Soil Sciences is 20 hours beyond the Master's degree requirements. Up to 9 hours of PSS 8701-8771 Current Topics</p>	

may be included to meet these requirements.		may be included to meet these requirements.	
Total Hours	40	Total Hours	40

### 3. JUSTIFICATION FOR DISTANCE LEARNING OFFEREING

Adding a distance education option (campus 5) will open the possibility of reaching a greater number of students needing an advanced degree in Plant Sciences. It will provide flexibility to meet emerging graduate student needs and reach a larger audience. Adding distance education option will make the PSS program accessible to professionals who live away from campus as well as individuals who travel frequently or who may not have access or ability to travel to campus to pursue a graduate degree.

#### TARGET AUDIENCE

The target audience for the online PSS MS degree is those students who currently work in the field and desire professional development and career advancement opportunities. It includes non-traditional students and/or early/mid-career individuals seeking a terminal degree by distance learning. Specific target audience examples include; non-traditional students, Extension agents/personnel, early/mid-career individuals in agricultural industries, military personnel, and State/Federal employees.

The following courses have been approved for online instruction (either Campus 1 or/and Campus 5) providing a path to obtain the degree online. The department also participates in a course share MOA (ACCEPtS) with three other universities in which the courses are offered online Campus 1 at Mississippi State University. PSS will add the Campus 5 option to additional courses as the program grows.

#### These courses satisfy the Biochemistry requirement for the Horticulture PhD.

BCH 6013 Prin. Biochemistry (Campus 5)

BCH 6903 Plant Biochem & Mol Biol. (Campus 1 online, ACCEPtS and Campus 5)

#### The following are PSS courses offered online.

PSS 6013 Prin. Floral Design II (**Campus 5 proposal submitted**)

PSS 6023 Floral Management (Campus 1 online)

PSS 6033 Case Studies in Floral Management (Campus 1 online)

PSS 6043 International Horticulture (Campus 1 online, ACCEPtS)

PSS 6113 Agricultural Crop Physiology (Campus 1 online, ACCEPtS)

PSS 6153 Sustainable Agroecology (Campus 1 online, ACCEPtS)

PSS 6313 Soil Fertility and Fertilizers (Campus 5)

PSS 6333 Soil Conservation and Land Use (Campus 1 online & 5)

PSS 6341 Controlled Environment Agriculture Laboratory (Campus 1 online, ACCEPtS)

PSS 6343 Controlled Environment Agriculture (Campus 1 online, ACCEPtS)

PSS 6363 Sustainable Nursery Production (Campus 1 online, ACCEPtS)

PSS 6383 Agriculture Remote Sensing I (Campus 1 online)

PSS 6443 Athletic Field Mgmt (Campus 1 online, ACCEPtS; **Campus 5 submitted**)

PSS 6453 Vegetable Production (**Campus 5 proposal submitted**)

PSS 6473 Hydroponic and Soilless Crop Production (**Campus 5 proposal submitted**)

PSS 6483 Intro. To Remote Sensing Technologies (Campus 5)

PSS 6553 Plant Growth and Development (Campus 1 online, ACCEPtS)  
PSS 6603 Soil Chemistry (Campus 5)  
PSS 6833 Temperature Stress Physiology (Campus 1 online, ACCEPtS)  
PSS 7000 Directed Individual Study (Campus 5)  
PSS 8012 Thesis Proposal Writing (Campus 1 online)  
PSS 8103 Pasture Development (Campus 5)  
PSS 8123 Crop Ecology (Campus 5)  
PSS 8333 Advanced Soil Fertility (Campus 5)  
PSS 8343 Soil Plant Atmosphere Relationships (Campus 5)  
PSS 8553 Phytohormones and Growth Regulation (**Campus 5 proposal submitted**)

The following Statistics courses have been approved for Campus 5 and may satisfy the Graduate Statistics requirements if offered.

ST 8114 Statistical Methods (Campus 5)  
ST 8123 Statistical Thinking: Prob. Models & Theory of Stats (Campus 5)  
ST 8253 Regression Analysis (Campus 5)

4. LEARNING OUTCOMES (No change from current program and will be the same for in-person and online students)

Expected Learning Outcomes

1. Students will be able to demonstrate a broad based knowledge in their respective discipline.
2. Students will demonstrate a broad based knowledge related to identification and management of issues in Mississippi and how these relate to issues regionally and globally within their respective discipline.
3. Students will know and understand current trends and important issues within their respective discipline.
4. Students will have a working knowledge of research methodology, experimental design, data management and interpretation.
5. Students will be able to communicate effectively with clientele and peers in their disciplines.

Assessment Methods.

Students in the Doctor of Philosophy Plant and Soil Sciences degree program will be required to complete the following before earning their degree.

Ph.D. — A qualifying examination may be administered at the beginning of the student's program to determine deficiencies in prior training. The student must successfully complete a program of study as approved by the major advisor and graduate committee. A minimum number of 20 hours coursework (including a graduate level statistics course, and two seminars (PSS 8821-8831)) and a minimum of 20 hours of research/dissertation (PSS 9000) are required. The first seminar, which should be done in within the first year of the student's program, will present the research proposal and include a review of relevant literature, and the second, or exit seminar, will describe the results of the student's dissertation research. The student must pass a written and oral preliminary exam administered by the graduate committee after completion or within 6 hours of

completing coursework to be considered a doctoral candidate. Original research and a dissertation are required of all candidates for the doctorate. An oral dissertation defense and exam are required. At least one semester of teaching experience is strongly encouraged. The graduate committee must approve the dissertation topic, research proposal, program of study, and final dissertation.

5. EFFECTIVE DATE  
Fall 2022

6. CONTACT PERSON  
Richard Harkess  
662-325-4556  
richard.harkess@msstate.edu

7. SUPPORT  
A letter of support is included from the Department of Plant and Soil Sciences Courses and Curriculum Committee.



**MISSISSIPPI STATE**  
UNIVERSITY

**COLLEGE OF AGRICULTURE & LIFE SCIENCES**  
Department of Plant and Soil Sciences

117 Dorman Hall, Box 9555  
32 Creelman Street  
Mississippi State, MS 39762

P. 662.325.2311

F. 662.325.8742

[www.pss.msstate.edu](http://www.pss.msstate.edu)

24 January 2022

University Courses & Curriculum Committee

Andy Perkins, Chair

281 Garner Hall;

Post Office Box 5268

Mailstop: 9702

Mississippi State, MS 39762

UCCC:

The PSS CCC met as a committee to discuss the proposed addition of Campus 5 Distance Education to our Masters and Doctorate degree programs. After review and discussion with the committee and input from department faculty, the PSS Curriculum Committee voted unanimously to support the addition of the Campus 5 Distance Education degree programs. The committee determined the addition of Distance Education degree option reflects current teaching practices, is relevant to student needs, and will fulfill department constituent needs. These programs do not represent a duplication of effort from other programs offered at Mississippi State University.

Sincerely,

**Richard L Harkess**

Richard L. Harkess, Chair

Plant and Soil Sciences Courses & Curriculum Committee

PSS CCommittee:

**Michael Cox**

Michael Cox

**William**

William Kingery

**Fred Musser**

Fred Musser

**Cole Etheredge**

Cole Etheredge

**David Lang**

David Lang

**Barry Stewart**

Barry Stewart

**Darrin M. Dodds**

Darrin Dodds, Dept. Head, PSS

c: Cindy Williams, Administrative Assistant

Signature: Michael Cox  
Michael Cox (Jan 28, 2022 11:41 CST)  
Email: msc15@msstate.edu

Signature: Fred Musser  
Fred Musser (Jan 31, 2022 11:04 CST)  
Email: fm61@msstate.edu

Signature: David Lang  
David J. Lang (Feb 1, 2022 12:11 CST)  
Email: dlang@pss.msstate.edu

Signature: Darrin M. Dodds  
Darrin M. Dodds (Feb 1, 2022 11:51 CST)  
Email: dmd76@msstate.edu

Signature: William Kingery  
William Kingery (Jan 24, 2022 11:59 CST)  
Email: wlk2@msstate.edu

Signature: Coleman Etheredge  
Coleman Etheredge (Feb 1, 2022 11:50 CST)  
Email: cle248@msstate.edu

Signature: Barry Stewart  
Barry Stewart (Feb 1, 2022 11:30 CST)  
Email: brs40@msstate.edu

Signature: Richard L. Hobbs  
Email: rlh18@msstate.edu













# PSS CCC Support letter Online Grad Degree Programs


Final Audit Report


2022-02-01


Created:	2022-01-24
By:	Richard Harkess (rharkess@pss.msstate.edu)
Status:	Signed
Transaction ID:	CBJCHBCAABAABAWHrJSJi6_YYeGOK4-B99maMZVPIWyG1R


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**Appendix 10: Report of Intent to Offer an Existing Degree Program by Distance Learning**  
 (Submit Appendix 10 in PDF format with signatures)

**Institution:** Mississippi State University

**Date of Initial Program Approval:** Fall 2015      **Date of Implementation:** Spring 2016      **Cost to Offer by Distance Learning:** \$2,000

**Program Title as It Appears on Academic Program Inventory, Diploma, and Transcript:** Plant and Soil Sciences Doctor of Philosophy      **Six-Digit CIP Code(s) & Four-Digit Sequence Code(s):** 01.1101  
CIP & Sequence codes: ULL Active Program Inventory

**Degree(s) to be Awarded:** Doctor of Philosophy      **Credit Hour Requirements:** 40

**Can this program be completed entirely online?**  Yes  No

**Will this program require separate admission from those offered on-campus?**  Yes  No

**Responsible Academic Unit(s):**  
 Department of Plant and Soil Sciences

**Institutional Contact:** Dr. Darrin Dodds  
**Phone:** 662-325-2698  
**Email:** dmd76@msstate.edu

**Number of Students Expected to Enroll in First Six Years:**

Year One 2  
 Year Two 4  
 Year Three 6  
 Year Four 6  
 Year Five 6  
 Year Six 6  
 Total 30

**Number of Graduates Expected in First Six Years:**

Year One 0  
 Year Two 0  
 Year Three 2  
 Year Four 4  
 Year Five 6  
 Year Six 6  
 Total 18

**Program Summary:**

This degree modification will add the option of distance education. Students choosing this option will have the ability to complete their degree online under the supervision of graduate faculty in the department. An online option will open the degree program to a wider population seeking graduate education in the Plant and Soil Sciences and provide opportunity for industry/University collaboration.

  
 Chief Academic Officer Signature

2-3-22  
 Date

  
 Institutional Executive Officer Signature

2-3-22  
 Date





**MISSISSIPPI STATE**  
UNIVERSITY

Office of the Provost and  
Executive Vice President

P.O. Box BQ  
3500 Lee Hall  
Mississippi State, MS 39762-5566

P: 662.325.3742  
F: 662.325.4039

February 24, 2022

**IHL BOARD NOTIFICATION**

TO: Scott Willard  
Dean, College of Ag & Life Sciences

FROM: David Shaw   
Provost and Executive Vice President

Please be advised the following *Intent to Offer an Existing Degree Program by Distance Learning* submitted to the Mississippi Board of Trustees of State Institutions of Higher Learning for their Information agenda has been accepted.

- Master of Science in Plant & Soil Sciences (CIP 01.1101)
- Doctor of Philosophy in Plant & Soil Sciences (CIP 01.1101)

c: Mark Keenum, President  
Peter Ryan, Executive Vice Provost & Dean, Graduate School  
Keith Coble, VP, DAFVM  
Brent Fountain, Vice Provost, Academic Affairs  
Jim Dunne, Associate VP, Academic Affairs  
John Dickerson, Assistant VP, Enrollment  
Emily Shaw, Associate Registrar  
Amy Adkerson, Special Projects Coordinator, Registrar's office  
Nancy Fultz, Academic Programs Support Manager  
Tracey Baham, Assistant VP, Institutional Strategy & Effectiveness  
Andy Perkins, Chair, UCCC



APPROVAL FORM FOR  
**DEGREE PROGRAMS**  
MISSISSIPPI STATE UNIVERSITY

NOTE: This form is a cover sheet that must accompany the degree program change proposal. The actual proposal should be prepared in accordance with format requirements provided in the *Guide and Format for Curriculum Proposals* published by the UCCC. Both cover sheet and proposal should be submitted to UCCC Mail Stop 9702 (281 Garner Hall), Phone: 325-9410.

College: CALS Department: Human Sciences  
Contact Person: Charles Freeman Mail Stop: 9745 E-mail: cf617@msstate.edu  
Nature of Change: Modification Date Initiated: SP 2022 Effective Date: FA 2022

Current Degree Program Name: M.S. Fashion Design & Merchandising  
Major: Fashion Design & Merchandising Concentration: Design & Product Development or Merchandising

New Degree Program Name: M.S. Fashion Design & Merchandising  
Major: Fashion Design & Merchandising Concentration: Design & Product Development, Merchandising, or Research in Fashion Design and Merchandising

Summary of Proposed Changes: Changed to course offerings to be more in line with accreditation at the university. We have added a third concentration for research/thesis track students and streamlined our professional/non-thesis concentrations. We have modified 8000 courses and elective offerings to meet the 12/15 8000-level hour requirement for graduation. We have reduced the number of hours to be more in line with current offerings in the school.

Approved: \_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_  
Department Head

\_\_\_\_\_  
Chair, College or School Curriculum Committee

\_\_\_\_\_  
Dean of College or School

\_\_\_\_\_  
Chair, University Committee on Courses and Curricula

*Rebecca Polichaux Davis* 4/1/2022  
\_\_\_\_\_  
Chair, Graduate Council (if applicable)

*Peter L. Ryan* 12<sup>th</sup> May, 2022  
\_\_\_\_\_  
Chair, Deans Council

APPROVAL FORM FOR  
**DEGREE PROGRAMS**  
MISSISSIPPI STATE UNIVERSITY

NOTE: This form is a cover sheet that must accompany the degree program change proposal. The actual proposal should be prepared in accordance with format requirements provided in the *Guide and Format for Curriculum Proposals* published by the UCCC. Both cover sheet and proposal should be submitted to UCCC Mail Stop 9702 (281 Garner Hall), Phone: 325-9410.

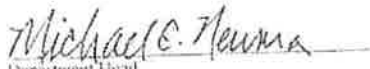
College: CALS Department: Human Sciences  
Contact Person: Charles Freeman Mail Stop: 9745 E-mail: cf617@msstate.edu  
Nature of Change: Modification Date Initiated: SP 2022 Effective Date: FA 2022  
Current Degree Program Name: M.S. Fashion Design & Merchandising

Major: Fashion Design & Merchandising Concentration: Design & Product Development or Merchandising  
New Degree Program Name: Concentration:  
Major:

Summary of Proposed Changes: Changed to course offerings to be more in line with accreditation at the university. We have added a third concentration for research/thesis track students and streamlined our professional/non-thesis concentrations. We have modified 8000 courses and elective offerings to meet the 12/15 8000-level hour requirement for graduation. We have reduced the number of hours to be more in line with current offerings in the school.

Approved:

Date:

  
Department Head

2-16-22

  
Chair, College or School Curriculum Committee

2/25/2022

  
Dean of College or School

3/3/2022

  
Chair, University Committee on Courses and Curricula

3/31/2022

  
Chair, Graduate Council (if applicable)

4/1/2022

Chair, Deans Council



**GRADUATE DEGREE MODIFICATION OUTLINE FORM**

Use the chart below to make modifications to an existing Graduate Degree. All deleted courses and information should be shown in *italics* and all new courses and information in **bold**. Please include the course prefix, number, and title in both columns. Expand rows as needed.

CURRENT Degree Description	PROPOSED Degree Description
<p>Degree: Master of Science (M.S.)                      Major: Fashion Design and Merchandising                      Concentration 1: Merchandising                      Concentration 2: Design and Product Development</p>	<p>Degree: Master of Science (M.S.)                      Major: Fashion Design and Merchandising                      Concentration 1: Design and Product Development                      Concentration 2: Merchandising  <b>Concentration 3: Research in Fashion Design and Merchandising</b></p>
<p>The graduate degree (M.S.) in Fashion Design and Merchandising (FDM) will be offered through the School of Human Sciences at Mississippi State University. FDM is based on an interdisciplinary approach to understand consumers, fashion businesses and fashion and related industries in the context of fashion culture in the society. Graduates will become future leaders in the textile, apparel, and retail industries to promote the economic development of industry sectors that increase the quality of life for people around the world. They will also advance research and policy in areas related to the fashion industry to broaden the effects of academic application of research in practice, as well as governmental actions on the fashion complex. This degree is designed to provide students with an in-depth understanding of the fashion and retail industry, consumer behavior, product development, business principles, and technology applications. Students select a concentration in one of <i>two areas: Merchandising or Design and Product Development.</i></p> <p><b>Admission Requirements</b>                      An individual must have a valid admission status in the Office of The Graduate School to secure enrollment. Admission to graduate study is limited to the pursuit of requirements for the degree and the field of study as specified in the student's application and statement of purpose. Qualified applicants for the FDM graduate program are expected to have interests and goals that are consistent with the department's faculty expertise and interests, as well as course offerings. <i>Once all application materials have been submitted, applicants should contact the FDM graduate coordinator at (662)325-2950 to schedule an interview with members of the FDM graduate faculty. To accommodate international</i></p>	<p>The graduate degree (M.S.) in Fashion Design and Merchandising (FDM) will be offered through the School of Human Sciences at Mississippi State University. FDM is based on an interdisciplinary approach to understand consumers, fashion businesses and fashion and related industries in the context of fashion culture in the society. Graduates will become future leaders in the textile, apparel, and retail industries to promote the economic development of industry sectors that increase the quality of life for people around the world. They will also advance research and policy in areas related to the fashion industry to broaden the effects of academic application of research in practice, as well as governmental actions on the fashion complex. This degree is designed to provide students with an in-depth understanding of the fashion and retail industry, consumer behavior, product development, business principles, and technology applications. Students select a concentration in one of <b>three areas: (1) Design and Product Development (2) Merchandising, and (3) Research in Fashion Design and Merchandising.</b></p> <p><b>Admission Requirements</b>                      An individual must have a valid admission status in the Office of The Graduate School to secure enrollment. Admission to graduate study is limited to the pursuit of requirements for the degree and the field of study as specified in the student's application and statement of purpose. Qualified applicants for the FDM graduate program are expected to have interests and goals that are consistent with the department's faculty expertise and interests, as well as course offerings. Admission decisions are based on a holistic consideration of the applicant's credentials. For international, non-native speakers of English, a TOEFL score indicative of ability to successfully complete graduate work is required. See English</p>

applicants, interviews can be conducted using distance technology. Admission decisions are based on a holistic consideration of the applicant's credentials.

For international, non-native speakers of English, a TOEFL score indicative of ability to successfully complete graduate work is required. See English Language Test Score Requirements in the MSU Graduate School catalog for more information.

#### Master's Admission Requirements

- meet all MSU Graduate School requirements for admission;
- have earned a baccalaureate degree in FDM or a related field;
- submit *Graduate Record Examination (GRE)* scores competitive with other applicants;
- submit three letters of recommendation, with at least two of the letters coming from individuals familiar with the applicant's academic work;
- current resume or CV
- submit a personal statement (500-1,000 words) describing the applicant's purpose for undertaking graduate study, statement of commitment to concentration area (merchandising or design & product development), professional plans, career goals, and detailed research interests.

For those applicants not possessing a B.S. in Fashion Design and Merchandising, admission will be considered on a case-by-case basis. If accepted, those students *will* be required to complete up to four leveling courses from the FDM undergraduate core curriculum.

#### Design and Product Development:

- FDM 1533 Basic Apparel Construction
- FDM 2524 Textiles for Apparel
- FDM 2593 Product Development II
- FDM 4343 Patternmaking and Design

#### Merchandising:

- FDM 2333 Intro to Buying and Management
- FDM 2524 Textiles for Apparel
- FDM 3553 Fashion Retail Pricing
- FDM 4533 Merchandise Planning and Buying

#### Coursework

*The master's degree in FDM requires 38 hours of course work and has a thesis and a non-thesis*

Language Test Score Requirements in the MSU Graduate Catalog for more information.

#### Master's Admission Requirements

- meet all MSU Graduate School requirements for admission;
- have earned a baccalaureate degree in FDM or a related field;
- submit three letters of recommendation, with at least two of the letters coming from individuals familiar with the applicant's academic work;
- current resume or CV
- submit a personal statement (500-1,000 words) describing the applicant's purpose for undertaking graduate study, **statement of commitment to concentration area (merchandising, design & product development or research in fashion design and merchandising)**, professional plans, career goals, and detailed research interests.

For those applicants not possessing a B.S. in Fashion Design and Merchandising, admission will be considered on a case-by-case basis. If accepted, those students **may** be required to complete up to four leveling courses from the FDM undergraduate core curriculum.

#### Design and Product Development:

- FDM 1533 Basic Apparel Construction
- FDM 2524 Textiles for Apparel
- FDM 2593 Product Development II
- FDM 4343 Patternmaking and Design

#### Merchandising:

- FDM 2333 Intro to Buying and Management
- FDM 2524 Textiles for Apparel
- FDM 3553 Fashion Retail Pricing
- FDM 4533 Merchandise Planning and Buying

#### Coursework

The master's degree in FDM requires a **minimum of 30** hours of course work.

Although the School of Human Sciences does have a limited number of assistantship opportunities, students are responsible for making their own arrangements for financing their graduate studies. For information about financial aid options and/or to complete a Free Application for Federal Student Aid (FAFSA), visit [www.sfa.msstate.edu](http://www.sfa.msstate.edu).

<p><i>option. A specialization will require 12 hours of coursework completed in one of the areas at the master's level</i></p> <p><i>Financing Your Graduate Education</i>  Although the School of Human Sciences does have a limited number of assistantship opportunities, students are responsible for making their own arrangements for financing their graduate studies. For information about financial aid options and/or to complete a Free Application for Federal Student Aid (FAFSA), visit <a href="http://www.sfa.msstate.edu">www.sfa.msstate.edu</a>.</p>		
<p>The Merchandising concentration explores the business and product development aspects of the fashion and retail industry from finalized design to the end use by consumers and beyond. Coursework prepares students to conduct in-depth research and analysis in a variety of fields such as merchandising, buying, international trade, fashion business and retail operations. Students learn real-world application through lab experiences in settings that align with the students' career goals.</p> <p>The Design and Product Development concentration explores the creative and product development aspects of the fashion and retail industry from trend innovation and concept to an end-use product and beyond. Coursework prepares students to conduct in-depth research and analysis in a variety of fields such as creative design, technical design, design processes and related creative industries. Students learn real-world application through lab experiences in settings that align with the students' career goals.</p>	<p>The Design and Product Development concentration explores the creative and product development aspects of the fashion and retail industry from trend innovation and concept to an end-use product and beyond. Coursework prepares students to conduct in-depth research and analysis in a variety of fields such as creative design, technical design, design processes and related creative industries. Students learn real-world application through lab experiences in settings that align with the students' career goals.</p> <p>The Merchandising concentration explores the business and product development aspects of the fashion and retail industry from finalized design to the end use by consumers and beyond. Coursework prepares students to conduct in-depth research and analysis in a variety of fields such as merchandising, buying, international trade, fashion business and retail operations. Students learn real-world application through lab experiences in settings that align with the students' career goals.</p> <p><b>The Research in Fashion Design and Merchandising concentration prepares a graduate to pursue a Ph.D. in Fashion Design and Merchandising or a related field. Coursework prepares students to conduct research across a variety of disciplines and methods. Students will conduct a research study as part of their final thesis, which is required in order to graduate with this concentration.</b></p>	

<b>CURRENT CURRICULUM OUTLINE</b>	<b>Required Hours</b>	<b>PROPOSED CURRICULUM OUTLINE</b>	<b>Required Hours</b>	
<i>College Required Courses</i> N/A		<b>College Required Courses</b> N/A		
<i>Major Required Courses</i> AELC 8803 <i>App Res Meth to AEE</i> (3) EPY 6214 <i>Educational and Psychological Statistics</i> (4) FDM 6424 <i>Teaching Methods in Agriculture and Human Sciences</i> (4) or AELC 8403 <i>Directed Learning Experiences</i> (3) if above course taken at undergraduate level FDM 6613 <i>Research in Fashion Consumer Behavior</i> (3) HDFS 8813 <i>Seminar in HDFS</i> (3) FDM 8000 <i>Research/thesis (thesis option)</i> (9) or FDM 8100 <i>Creative Project (non-thesis option)</i> (9)	25-26	<b>Major Required Courses</b> HDFS 8813 <i>Seminar in HDFS</i> (3) FDM 8803 <i>Research in FDM</i> (3)	6	
<i>Merchandising Concentration Courses:</i> FDM 6683 <i>Research and Application in Fashion Entrepreneurship</i> (3) FDM 6793 <i>Research and Application in Digital Fashion Retailing</i> (3) <i>Restricted Electives</i> (6) * * With approval of major professor and graduate committee, select one course related to student area of study.	12	<b>Design and Product Development Concentration Courses<sup>1</sup></b>  FDM 6443 <i>Advanced Patternmaking and Design</i> (3) OR FDM 6343 <i>Patternmaking &amp; Design</i> (3) FDM 6563 <i>Advanced Draping</i> (3) OR FDM 6363 <i>Draping</i> (3) FDM 6783 <i>Experimental Fashion Design</i> (3) OR FDM 6593 <i>Creative Design Tech</i> (3) FDM 6873 <i>Advanced Computer Design</i> (3) OR FDM 6733 <i>Computer-Aided Design</i> (3) FDM 7000 <i>Directed Individual Study</i> (6) OR Courses approved by Graduate Major Professor (6) FDM 8100 <i>Creative Project</i> (6) <sup>1</sup> All pre-requisites, including undergraduate courses must be met to enroll.	24	
<i>Design and Product Development Concentration Courses: (Select 4)</i> FDM 6123: <i>Research and Application in Product Development</i> FDM 6443 <i>Advanced Patternmaking and Design</i> (3) FDM 6563 <i>Advanced Draping</i> (3) FDM 6573: <i>Advanced Portfolio Development</i>	12	<b>Merchandising Concentration Courses<sup>1</sup></b>  FDM 6603 <i>Global Sourcing in the Textile and Apparel Industry</i> (3) FDM 6613 <i>Research in Fashion Consumer Behavior</i> (3) OR FDM 6513 <i>Fashion Consumer Behavior</i> (3) FDM 6683 <i>Research in Fashion Entrepreneurship</i> (3) OR FDM 6583 <i>Fashion Entrepreneurship</i> (3)	24	

<i>FDM 6783 Experimental Fashion Design (3)</i> <i>FDM 6873 Advanced Computer-Aided Design for Fashion (3)</i>		<b>FDM 6793 Research in Digital Fashion Retailing (3)</b> <b>FDM 7000 Directed Individual Study (6)</b> <b>OR Courses approved by Graduate Major Professor (6)</b> <b>FDM 8100 Creative Project (6)</b> <sup>1</sup> All pre-requisites, including undergraduate courses must be met to enroll.		
		<b>Research in Fashion Design and Merchandising Concentration Courses<sup>1</sup></b>  <b>EPY 6214 Educational and Psychological Statistics (4)</b> <b>Two (2) Research Courses approved by Graduate Thesis Committee and Major Professor (6)</b> <b>FDM 7000 Directed Individual Study (6)</b> <b>FDM 8000 Research/thesis (thesis option) (9)</b> <sup>1</sup> All pre-requisites, including undergraduate courses must be met to enroll.	25	
Total Hours	37-38	Total Hours	30 – 31	

### 3. Justification and Learning Outcomes:

Since our last degree modification in 2019, the FDM graduate program has introduced a variety of non-thesis options for students as well as an accelerated program. Due to the way courses are listed in the catalog and what we offer each semester, there has been some confusion for the students. This modification is an attempt to clarify these issues and account for the accelerated offerings in the graduate catalog. In addition, we have added a concentration with a focus on research in preparing students to pursue a PhD., which we do not offer. Students applying for these programs need to specialize in research and have that clear on their transcript. This new concentration will be focused on preparing them to enter academia or industry as a qualified and well-trained researcher. Lastly, since our last modification, we are offering more courses and have seen an increase in enrollment. This has enabled us to not have the need to rely on courses being taught outside the discipline and this modification cleans up some of the substitutions currently being done through CAPP. Learning objectives for the degree are listed below.

- Students will demonstrate the synergistic, integrative nature of the textile and apparel industries focusing on the apparel production, creative design, product development, merchandising, and retail operations, and students will apply this understanding to the current issues and opportunities of the globalized fashion and retail industry.
- Students will apply knowledge from their programs of study to the issues of creative design, communication of dress, technical and instructional design communication, and the business of a global fashion and retail industry.
- Students will integrate concepts of global interdependence as they relate to apparel and agriculture in their areas of specialization.
- Students will understand and apply appropriate technologies in addressing issues concerning the global fashion and retail industry.

- Students will understand resource development and sustainability and the impact that those concepts have on the growth of the global fashion and retail industry.

#### **4. Support**

Please see the attached letters of support.

#### **5. Proposed 4 Letter Abbreviation**

FDM

#### **6. Effective Date**

Fall 2022



**MISSISSIPPI STATE**  
UNIVERSITY.

SCHOOL OF HUMAN SCIENCES  
P. O. Box 9745  
Mississippi State, MS 39762  
P. 662.325.2950  
humansci.msstate.edu

February 16, 2022

Dr. William G Davis  
Chair, CALS Curriculum Committee  
Mississippi State, MS 39762

Dear Dr. Davis:

The School of Human Sciences Curriculum Committee affirms support for the modified FDM graduate program proposal. The modified proposal is aligned with accreditation requirements.

Sincerely,

*Julie Parker*  
Julie C. Parker, Chair

*Charles Freeman*  
Charles Freeman Member

*OP McCubbins*  
Andrew McCubbins, Member

*Carley Morrison*  
Carley Morrison, Member

*Chelsea Parise-Barron*  
Chelsea Parise-Barron, Member





Approved:

Date:

*Ei May*

3/2/2022

Department Head

*Ridolfi*

March 10, 2022

Chair, College or School Curriculum Committee

*Kimberly R. Hall*

03.10.2022

Dean of College or School

*Chris Peterson*

3/28/2022

Chair, University Committee on Courses and Curricula

*Rebecca Robinson Davis*

4/1/2022

Chair, Graduate Council (if applicable)

*Peter L. Ryan*

12<sup>th</sup> May, 2022

Chair, Deans Council

**GRADUATE DEGREE MODIFICATION OUTLINE FORM**

Use the chart below to make modifications to an existing Graduate Degree. All deleted courses and information should be shown in *italics* and all new courses and information in **bold**. Please include the course prefix, number, and title in both columns. Expand rows as needed.

CURRENT Degree Description		PROPOSED Degree Description	
Degree: Doctor of Education (Ed.D.) Major: Education Concentrations: <i>Educational Leadership</i>		Degree: Doctor of Education (Ed.D.) Major: Education Concentrations: <b>P-12 School Leadership</b>	
The Doctor of Education (Ed.D.) program offers a terminal degree designed to prepare scholar-practitioners serving in P-12 leadership positions. By combining educational theory with action research, students learn how to critically examine problems and provide solutions to needs at the building and district levels. Graduates will possess the content knowledge and research skills to improve schools in the P-12 educational system.		The Doctor of Education (Ed.D.) program offers a terminal degree designed to prepare scholar-practitioners serving in P-12 leadership positions. By combining educational theory with action research, students learn how to critically examine problems and provide solutions to needs at the building and district levels. Graduates will possess the content knowledge and research skills to improve schools in the P-12 educational system.	
The <i>Educational Leadership</i> concentration is designed to prepare educators in the P-12 School Leadership arena for leadership at the building and district levels.		The <b>P-12 School Leadership</b> concentration is designed to prepare educators in the P-12 School Leadership arena for leadership at the building and district levels.	
CURRENT CURRICULUM OUTLINE	Required Hours	PROPOSED CURRICULUM OUTLINE	Required Hours
College Required Courses None		College Required Courses None	
Major Required Courses EDA 8163 Public School Finance EDA 8223 Seminar in Administration EDA 8423 Law and Ethics in Educational Leadership EDA 8433 The Superintendency EDA 8443 Politics and Policy in Educational Leadership EDA 8453 Instructional Leadership EDA 8463 Technology and Communication in Educational Leadership EDA 8283 Educational Leadership EDA 8353 Applications of Theory to Educational Administration EDA 8413 Human Resources Administration in Educational Leadership EDA Elective 1 EDA Elective 2	- 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	Major Required Courses EDA 8163 Public School Finance EDA 8223 Seminar in Administration EDA 8423 Law and Ethics in Educational Leadership EDA 8433 The Superintendency EDA 8443 Politics and Policy in Educational Leadership EDA 8453 Instructional Leadership EDA 8463 Technology and Communication in Educational Leadership EDA 8283 Educational Leadership EDA 8353 Applications of Theory to Educational Administration EDA 8413 Human Resources Administration in Educational Leadership EDA Elective 1 EDA Elective 2	- 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
Concentration 1. Courses EDA 8473 Introduction to Research in Educational Leadership EDA 8493 Action Research EDA 8483 Survey Research EDA 8563 Program Evaluation EDA 8623 Doctoral Capstone 1 EDA 8633 Doctoral Capstone 2 EDA 8643 Doctoral Capstone 3	- 3 3 3 3 3 3 3	Concentration 1. Courses EDA 8473 Introduction to Research in Educational Leadership EDA 8493 Action Research EDA 8483 Survey Research EDA 8563 Program Evaluation EDA 8623 Doctoral Capstone 1 EDA 8633 Doctoral Capstone 2 EDA 8643 Doctoral Capstone 3	- 3 3 3 3 3 3 3
Concentration 2. Courses None		Concentration 2. Courses None	
Total Hours	57	Total Hours	57

## **JUSTIFICATION FOR CURRENT PROPOSAL (SUBMITTED AS A FOLLOW-UP TO A PROPOSAL APPROVED IN 2021)**

This proposal addresses a name change for a previously approved concentration under the Ed.D. in Education due to a technical error identified at the end of the proposal process.

The Ed.D. in Education with a concentration in Educational Leadership was fully approved by the UCCC in 2021. However, when IHL attempted to code the degree into their system, they found that "Educational Leadership" was not an option for the concentration title. To fix the problem, the Department of Educational Leadership was instructed to submit a subsequent request to change the concentration from Educational Leadership to P-12 School Leadership, a concentration title that already exists in the system. No changes have been made to the previously approved program or courses.

## **JUSTIFICATION AND LEARNING OUTCOMES FOR THE ORIGINAL PROPOSAL (APPROVED IN 2021)**

In an effort to better meet the needs of P-12 School Leadership students pursuing doctorate degrees in Educational Leadership we are proposing these modifications to the Doctor of Education (Ed.D.) degree in Educational Leadership. The modifications being proposed to the Ed.D. Program are requested to place the needs of P-12 doctoral students at the forefront. The overwhelming majority of our doctoral graduates pursue doctoral degrees in order to increase their qualifications for upper leadership positions at the school and district P-12 levels. These students also pursue doctoral degrees to increase their knowledgebase positioning them to be more effective P-12 school leaders. Traditionally, there has been a disconnect in research training for P-12 school leaders pursuing doctorate level education. Although the overwhelming majority of our doctoral candidates intend to remain as leaders in the P-12 setting, the research training offered in the Ph.D. Program and in our current Ed.D. Program is tailored more towards traditional theoretical research rather than applied research which is much more appropriate and applicable to the work that they do in the P-12 setting. Lastly, there is a sweeping trend in the P-12 Educational Leadership Field within the state of Mississippi and beyond which has resulted in more and more P-12 Educational Leadership Programs implementing Ed.D. Programs with a more applied research focus. Most of these programs require a capstone project or an applied research project as the culminating project rather than a traditional dissertation. These field-based capstone projects are designed to address a specific problem within their school or school district. This is what many P-12 Leaders are looking for when they pursue a doctoral program. In order to remain competitive with other doctoral programs within our state and within our region it is important that we are able to offer a similar program experience for potential and current students looking to advance their careers and knowledgebase.

### **Learning Outcomes**

Students will develop the skills and knowledge needed to engage in meaningful action research.

Students will learn and explore the legal and ethical implications as they relate to addressing action research.

Students will acquire the requisite knowledge needed to develop appropriate survey and sampling techniques to support their research.

Students will learn the principles of program evaluation as applied to educational problems of practice.

Students will learn the fundamental of investigating problems of practice and proposing solutions to address those problems.

Students will learn the fundamentals of data collection and analysis.

Students will develop research skills and knowledge appropriate for scholar practitioners.

Students will develop a deeper knowledge of the school leader's role in instructional leadership by promoting the effective instructional practices that will advance student achievement.

Students will be prepared to utilize the principles of human resources management from the perspective of an advanced educational leader.

Students will explore many of the critical elements of politics and policy impacting the field of educational leadership.

Students will gain a greater understanding of the complexities and responsibilities associated with the position of school superintendent.



**MISSISSIPPI STATE**  
UNIVERSITY™

**COLLEGE OF EDUCATION**  
Department of Educational Leadership

P.O. Box 6037  
245 Allen Hall  
175 President's Circle  
Mississippi State, MS 39762

P. 662.325.0969  
F. 662.325.0975  
educ.msstate.edu


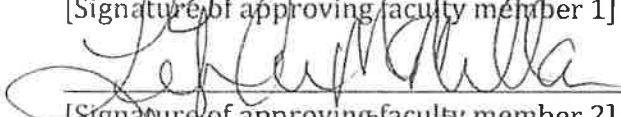
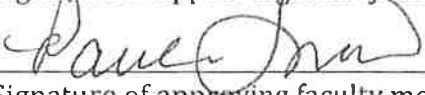
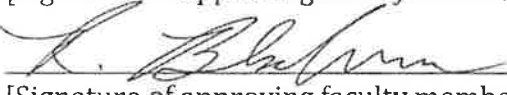
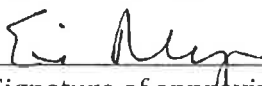
TO: UCCC

FROM: Myron Labat Jr., Educational Leadership Department Head

RE: Support for change of concentration to the Ed.D. program

DATE: November 1, 2021

This letter of support is offered by the P-12 Leadership faculty in the Department of Educational Leadership for a proposed change in the "concentration" of the Ed.D. The current program is listed with a major in "Education" with a concentration in "Educational Leadership." A concentration in "Educational Leadership" does not exist, so the Correct concentration area should be "P-12 School Leadership." As indicated by the signatures below, the program area faculty support the proposal as written for submission to the UCCC. Program Area Faculty:

	11/8/21
[Signature of approving faculty member 1]	[Date]
	11/15/21
[Signature of approving faculty member 2]	[Date]
	11/17/21
[Signature of approving faculty member 3]	[Date]
	11/30/21
[Signature of approving faculty member 4]	[Date]
	11/30/21
[Signature of approving faculty member 5]	[Date]

APPROVAL FORM FOR  
**DEGREE PROGRAMS**  
MISSISSIPPI STATE UNIVERSITY

**NOTE:** This form is a cover sheet that must accompany the degree program change proposal. The actual proposal should be prepared in accordance with format requirements provided in the *Guide and Format for Curriculum Proposals* published by the UCCC. Both cover sheet and proposal should be submitted to UCCC Mail Stop 9702 (281 Garner Hall), Phone: 325-9410.

**College:** Bagley College of Engineering **Department:** Electrical & Computer Engineering

**Contact Person:** Jean Mohammadi-Aragh **Mail Stop:** 9571 **E-mail:** jean@ece.msstate.edu

**Nature of Change:** add distance learning to an existing program

**Date Initiated:** 12/21/21 **Effective Date:** Fall 2022

**Current Degree Program Name:** Bachelor of Science in Electrical Engineering

**Major:** Electrical Engineering

**Concentration:** Electrical Engineering,  
Power and Energy Engineering

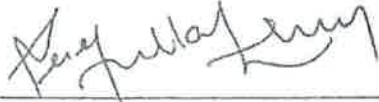
**Major:** no change

**Concentration:** no change

**Summary of Proposed Changes:**

Add distance learning to existing degree

**Approved:**



Department Head

**John Ball, PhD**

Digitally signed by John Ball, PhD  
(CN: cn=John Ball, PhD, o=MSU, ou=ECE,  
email=jball@ce.msu.edu, c=US  
Date: 2021.12.22 20:29:44 -06'00')

Chair, College or School Curriculum Committee

**Kari Babski-Reeves for Jason Keith**

Digitally signed by Karl Babski-Reeves for Jason Keith  
Date: 2022.01.06 08:51:35 -06'00'

Dean of College or School



Chair, University Committee on Courses and Curricula

Chair, Graduate Council (if applicable)



Chair, Deans Council

**Date:**

12/21/21

12/22/21

5/2/2022

12<sup>th</sup> May, 2022

## **PROPOSAL FOR THE MODIFICATION OF THE B.S. IN ELECTRICAL ENGINEERING**

### **1. CATALOG DESCRIPTION**

Alumni, employers, faculty and students participate in a process used to develop educational objectives for the undergraduate programs in Electrical Engineering and Computer Engineering. Within a few years of graduation, program graduates completing the baccalaureate degree in Electrical or Computer Engineering will:

- Be recognized by their peers as fundamentally sound in the application of mathematics, science, computing, and engineering.
- Be engaged in the practice of Electrical or Computer Engineering as innovative problem solvers with a strong work ethic, by identifying and implementing solutions using the proper tools, practical approaches, and flexible thinking.
- Be productive and demonstrate leadership in the practice of Electrical or Computer Engineering, both individually and within multidisciplinary teams, using effective oral and written communication skills when working with peers, supervisors, and the public.
- Be responsible in the practice of Electrical or Computer Engineering, relying on sound engineering ethics, a commitment to lifelong learning and a genuine concern for society and the environment.

The electrical engineer is a principal contributor to the modern technological age in which we live today. Following in the footsteps of inventors such as Thomas Edison and Alexander Graham Bell, the electrical engineer is developing technology that improves the quality of life. Developments in microelectronics, telecommunications, and power systems have had a profound effect on each of us. Electrical engineers have affected all segments of our society such as transportation, medicine, and the entertainment industry, to name only a few. Indeed, the electrical engineer has principally been responsible for the advent of the computer age in which we live today as well as the computer's miniaturization and rapid expansion in computational power.

The curriculum in electrical engineering has a foundation based on the principles of the electrical and physical sciences and uses mathematics as a common language to facilitate the solution of engineering problems. The core curriculum consists of a sequence of courses in digital devices, circuits and electronics, electromagnetic field theory, and modern energy conversion. In the senior year, students have the opportunity to take additional course work in one or more technical areas that include: telecommunications, electromagnetics, power systems, high voltage, feedback control systems, microelectronics, signal processing, and computer systems. Supporting course work outside electrical engineering consists of a strong background in mathematics, physical sciences, computer programming, social sciences, fine arts, humanities, and personal communication skills. Computers are used extensively throughout the curriculum, and students are expected to become proficient in higher-order programming languages and several application software tools. Although the concept of design is stressed throughout the program so as to emphasize the problem-solving skills of the engineer, the senior year includes a capstone design experience where much of the previous study is culminated.



Through this two-semester design course sequence, students are required to integrate design and analytical problem-solving skills together with communication skills in a team environment. Students expecting to graduate from Mississippi State University with a bachelor of science degree in electrical engineering, in addition to satisfactorily completing the EE curriculum requirements, must meet the following minimum GPA requirements for graduation:

- make an overall C average on all hours scheduled and rescheduled at all institutions attended, including MSU (2.00 or better cumulative GPA)
- make a C average on all hours scheduled and rescheduled at MSU (2.00 or better MSU GPA)
- earn at least a 2.00 cumulative grade point average on all courses scheduled and rescheduled (average on all attempts) at MSU that are applied toward meeting degree requirements
- earn at least a 2.5/4.0 average on all hours with ECE or CSE course prefixes at all institutions attended, including MSU, that are applied toward meeting degree requirements

The electrical engineering program is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>.

For a list of online tuition, instructional support, and other distance fees, please see the Controller's web site at: <https://www.controller.msstate.edu/accountservices/tuition/>

## 2. CURRICULUM OUTLINE

Our Electrical Engineering program has two concentrations: Electrical Engineering and Power and Energy Engineering. The curriculum for both is very similar but key differences will be addressed.

### **Extent of the degree that is offered through distance learning:**

For the Electrical Engineering concentration, as of this submission, 100 out of 128 hours required for the degree are approved and offered via distance; 78% of the program can be completed via distance. For the Power and Energy Engineering concentration, as of this submission, 94 out of 128 hours required for the degree are approved and offered via distance; 73% of the program can be completed via distance.

For both concentrations, by Fall 2022, we anticipate **115 out of 128 total hours (~90%)** required for both degree concentrations will be approved and offered through MSU's distance education offerings. The remaining **13 hours** will currently need to be completed through MSU's Starkville, Meridian, or Gulf Coast campus offerings, or transferred to MSU from another institution.

### **Details of courses currently offered / planned to be offered as face-to-face only:**

For both concentrations, the courses (13 hours) that are either not currently approved for MSU's distance offerings (and not pending approval) **or** are not offered online frequently enough to meet our undergraduate student needs are listed as follows:

- CH 1211 Chemistry Lab
- CH 1213 Chemistry I
- PH 2213 Physics I
- PH 2223 Physics II
- MA 2743 Calculus IV

After consulting with the departments associated with these courses, we anticipate 10 hours (CH and PH courses) will remain face-to-face for the foreseeable future. It is possible MA 2743 may become a distance-approved course. These courses are the 13 hours that will need to be completed through MSU's Starkville, Meridian, or Gulf Coast campus offerings, or transferred to MSU from another institution.

All 13 hours are widely available on MSU campuses and at Mississippi community colleges and other institutions of higher learning throughout the country. We do not anticipate any hardships for students related to access for these 13 credit-hours.

**Details of courses currently offered as face-to-face but planned to be offered via distance:**

For both concentrations, within our Department, there are currently 15 hours of ECE courses required for the B.S. in Electrical Engineering that are pending distance approval in the UCCC workflow. Details are as follows:

- ECE 3323 Electromagnetics II – passed contingent at Sept 3, 2021 meeting; contingencies have been addressed and are pending final approval
- ECE 3614 Fundamentals of Energy Systems – in UCCC workflow for distance approval
- ECE 3714 Digital Devices and Logic Design – in UCCC workflow for distance approval
- ECE 3724 Microprocessors – in UCCC workflow for distance approval

For the Power and Energy Concentration only, there are 6 additional required hours that are not approved for distance at the 4000-level (but are approved and taught via distance at the 6000-level). Due to prerequisites requirements, newly admitted distance EE students would not be eligible to enroll in these courses until Spring 2023 at the earliest. We plan to submit these courses for distance approval in the near future. However, until they are approved for distance, students enrolled in the Power and Energy Concentration will be required to complete these courses on the Starkville campus or transfer an equivalent course taken at another institution.

- ECE 4613 Power Transmission Systems – approved at 6000-level for distance and will submit for 4000-level distance approval; until approved students will need to take on Starkville campus or transfer an equivalent course.
- ECE 4633 Power Distribution Systems – approved at 6000-level for distance and will submit for 4000-level distance approval; until approved students will need to take on Starkville campus or transfer an equivalent course.

**No changes are proposed to the curriculum. The current curriculum tables are provided below for reference.**

CURRENT Degree Description	PROPOSED Degree Description
Degree: Bachelor of Science in Electrical Engineering Major: Electrical Engineering Concentration: N/A	Degree: Bachelor of Science in Electrical Engineering Major: Electrical Engineering Concentration: N/A

Alumni, employers, faculty and students participate in a process used to develop educational objectives for the undergraduate programs in Electrical Engineering and Computer Engineering. Within a few years of graduation, program graduates completing the baccalaureate degree in Electrical or Computer Engineering will:

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The electrical engineering program is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>.

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Fine Arts: see General Education courses	3	Fine Arts: see General Education courses	3
Natural Sciences see Major Core		Natural Sciences see Major Core	

Math see Major Core		Math see Major Core	
Humanities see General Education courses	6	Humanities see General Education courses	6
Social/Behavioral Sciences see General Education courses	6	Social/Behavioral Sciences see General Education courses	6
Major Core Courses Math and Basic Science (31h) MA 1713 Calculus I MA 1723 Calculus II MA 2733 Calculus III MA 2743 Calculus IV MA 3113 Introduction to Linear Algebra MA 3253 Differential Equations I IE 4613 Engineering Statistics I CH 1213 Chemistry I CH 1211 Investigations in Chemistry I PH 2213 Physics I PH 2223 Physics II  Engineering Topics (76h) CSE 1284 Introduction to Computer Programming CSE 1384 Intermediate Computer Programming CSE 2383 Data Structures and Analysis of Algorithms ECE 1013 Introduction to ECE Design I ECE 1022 Introduction to ECE Design II ECE 3423 Circuits I ECE 3421 Circuits I Lab ECE 3433 Circuits II ECE 3244 Electronics I ECE 3443 Signals and Systems ECE 3313 Electromagnetics I ECE 3323 Electromagnetics II ECE 3614 Fundamentals of Energy Systems ECE 4512 EE Design I ECE 4522 EE Design II ECE 3714 Digital Devices and Logic Design ECE 3724 Microprocessors EM 2413 Engineering Mechanics I or ME 3513 Thermodynamics I EE technical electives Engineering Science elective (3h) Professional Enrichment elective (3h)  Oral Communication Requirement Fulfilled in ECE 1013, ECE 1022, ECE 4512, ECE 4522, and GE 3513	3 3 3 3 3 3 3 3 1 3 3  4 4 3 3 2 3 1 3 3 4 3 3 3 4 2 2 4 4 3 12 3 3	Major Core Courses Math and Basic Science (31h) MA 1713 Calculus I MA 1723 Calculus II MA 2733 Calculus III MA 2743 Calculus IV MA 3113 Introduction to Linear Algebra MA 3253 Differential Equations I IE 4613 Engineering Statistics I CH 1213 Chemistry I CH 1211 Investigations in Chemistry I PH 2213 Physics I PH 2223 Physics II  Engineering Topics (76h) CSE 1284 Introduction to Computer Programming CSE 1384 Intermediate Computer Programming CSE 2383 Data Structures and Analysis of Algorithms ECE 1013 Introduction to ECE Design I ECE 1022 Introduction to ECE Design II ECE 3423 Circuits I ECE 3421 Circuits I Lab ECE 3433 Circuits II ECE 3244 Electronics I ECE 3443 Signals and Systems ECE 3313 Electromagnetics I ECE 3323 Electromagnetics II ECE 3614 Fundamentals of Energy Systems ECE 4512 EE Design I ECE 4522 EE Design II ECE 3714 Digital Devices and Logic Design ECE 3724 Microprocessors EM 2413 Engineering Mechanics I or ME 3513 Thermodynamics I EE technical electives Engineering Science elective (3h) Professional Enrichment elective (3h)  Oral Communication Requirement Fulfilled in ECE 1013, ECE 1022, ECE 4512, ECE 4522, and GE 3513	3 3 3 3 3 3 3 1 3 3  4 4 3 3 2 3 1 3 3 4 3 3 3 4 2 2 4 4 3 12 3 3

Writing Requirement GE 3513 Technical Writing	3	Writing Requirement GE 3513 Technical Writing	3
Computer Literacy Fulfilled in Engineering Topics courses		Computer Literacy Fulfilled in Engineering Topics courses	
Concentration Courses		Concentration Courses	
	12		12
Total Hours	128	Total Hours	128

CURRENT Degree Description	PROPOSED Degree Description
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<p>The electrical engineering concentration allows students the flexibility to take a broad range of course in a minimum of two topic areas. Students may take a variety of courses that fit their individual interests in electrical engineering.</p>		<p>The electrical engineering concentration allows students the flexibility to take a broad range of course in a minimum of two topic areas. Students may take a variety of courses that fit their individual interests in electrical engineering.</p>	
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Engineering Topics (64h) CSE 1284 Introduction to Computer Programming	4	Engineering Topics (64h) CSE 1284 Introduction to Computer Programming	4



CSE 1384 Intermediate Computer Programming	4	CSE 1384 Intermediate Computer Programming	4
CSE 2383 Data Structures and Analysis of Algorithms	3	CSE 2383 Data Structures and Analysis of Algorithms	3
ECE 1013 Introduction to ECE Design I	3	ECE 1013 Introduction to ECE Design I	3
ECE 1022 Introduction to ECE Design II	2	ECE 1022 Introduction to ECE Design II	2
ECE 3423 Circuits I	3	ECE 3423 Circuits I	3
ECE 3421 Circuits I Lab	1	ECE 3421 Circuits I Lab	1
ECE 3433 Circuits II	3	ECE 3433 Circuits II	3
ECE 3244 Electronics I	4	ECE 3244 Electronics I	4
ECE 3443 Signals and Systems	3	ECE 3443 Signals and Systems	3
ECE 3313 Electromagnetics I	3	ECE 3313 Electromagnetics I	3
ECE 3323 Electromagnetics II	3	ECE 3323 Electromagnetics II	3
ECE 3614 Fundamentals of Energy Systems	4	ECE 3614 Fundamentals of Energy Systems	4
ECE 4512 EE Design I	2	ECE 4512 EE Design I	2
ECE 4522 EE Design II	2	ECE 4522 EE Design II	2
ECE 3714 Digital Devices and Logic Design	4	ECE 3714 Digital Devices and Logic Design	4
ECE 3724 Microprocessors	4	ECE 3724 Microprocessors	4
EM 2413 Engineering Mechanics I or ME 3513 Thermodynamics I	3	EM 2413 Engineering Mechanics I or ME 3513 Thermodynamics I	3
Engineering Science elective (3h)	3	Engineering Science elective (3h)	3
Professional Enrichment elective (3h)	3	Professional Enrichment elective (3h)	3
Oral Communication Requirement Fulfilled in ECE 1013, ECE 1022, ECE 4512, ECE 4522, and GE 3513		Oral Communication Requirement Fulfilled in ECE 1013, ECE 1022, ECE 4512, ECE 4522, and GE 3513	
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<b>Concentration Courses</b>		<b>Concentration Courses</b>	
Power and Energy Engineering (6h) ECE 4613 Power Transmission Systems	3	Power and Energy Engineering (6h) ECE 4613 Power Transmission Systems	3
ECE 4633 Power Distribution Systems	3	ECE 4633 Power Distribution Systems	3
Power and Energy Electives (6h)	6	Power and Energy Electives (6h)	6
Choose from: ECE 4643 Power Systems Relaying & Control ECE 4653 Power Electronics ECE 4663 Insulation Coordination in Electric Power Systems ECE 4673 Fundamentals of High Voltage Engineering (see advisor for list of additional approved elective courses)		Choose from: ECE 4643 Power Systems Relaying & Control ECE 4653 Power Electronics ECE 4663 Insulation Coordination in Electric Power Systems ECE 4673 Fundamentals of High Voltage Engineering (see advisor for list of additional approved elective courses)	

Total Hours	128	Total Hours	128

### 3. JUSTIFICATION FOR DISTANCE LEARNING OUTCOMES

Electrical engineering is an important field for a wide range of audiences. Electrical engineers are employed in a variety of industries. We have had numerous inquiries about distance offerings from potential students who have earned a two-year electrical technology or similar degree and are working full-time in industry. They cannot take 2-3 years off from work to complete the requirements for an electrical engineering degree, but not having the degree prevents them from advancing their careers. To some extent, our EE degree program on the MS Gulf Coast campus has addressed this for potential students located on the coast – we offer night classes on the Gulf Coast campus. However, the face-to-face requirement still excludes numerous potential students. An online program will allow those students to fulfill their needs and earn an EE degree.

The ECE faculty are committed to distance education. Numerous ECE faculty have been successfully supporting our well-established online graduate degrees in Electrical and Computer Engineering for over a decade. Current distance courses in ECE include a variety of online learning techniques such as videos with quizzes, synchronous activities, office hours, and other active learning activities. In the Fall 2021 semester, ECE faculty participated in two distance training sessions arranged for the department by BCOE distance education staff. ECE distance classes have received positive student survey results, and we intend to use our proven methods for offering courses for our undergraduate students. The program will be delivered through a mix of synchronous and asynchronous courses recorded via Webex or in the BCOE distance classrooms.

#### TARGET AUDIENCES

- Regional traditional students who need the option of distance education to complete their degree for various reasons, including taking care of sick parent, needing to work full-time, co-op, or any other reason.
- Non-traditional students who already work in the electrical field and want to complete a degree in the area in which they see a long-term future.
- Non-traditional students who started a degree in electrical engineering at some point, never finished the degree, and have a desire to finish the degree.
- Veterans and military personnel wanting to work in electrical and computer engineering.

### 4. LEARNING OUTCOMES

As a result of this degree program modification, there are no changes to the student learning outcomes. The EE student learning outcomes are as follows:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

**5. EFFECTIVE DATE**

Fall 2022

**6. CONTACT PERSON**

Jean Mohammadi-Aragh, [jean@ece.msstate.edu](mailto:jean@ece.msstate.edu), 662-325-2042

**7. LETTER OF SUPPORT**

See attached

**8. IHL FORM**

See attached

APPROVAL FORM FOR  
**DEGREE PROGRAMS**  
MISSISSIPPI STATE UNIVERSITY

**NOTE:** This form is a cover sheet that must accompany the degree program change proposal. The actual proposal should be prepared in accordance with format requirements provided in the *Guide and Format for Curriculum Proposals* published by the UCCC. Both cover sheet and proposal should be submitted to UCCC Mail Stop 9702 (281 Garner Hall), Phone: 325-9410.

**College:** BCoE

**Department:** Industrial and Systems Engineering

**Contact Person:** Dr. Linkan Bian

**Mail Stop:** 9542

**E-mail:** bian@ise.msstate.edu

**Nature of Change:** Modification

**Date Initiated:** 02/25/2022

**Effective Date:** 08/16/2022

**Degree Program Name:** Master of Science in Industrial and Systems Engineering

**Major:** Industrial and Systems Engineering

**Concentration:** 1. Human Factors and Ergonomics

2. Industrial Systems

3. Operations Research

4. Management Systems Engineering

5. Manufacturing Systems

**Major:** Industrial and Systems Engineering

**Concentration:** 1. Human Factors and Ergonomics

2. Industrial Systems

3. Operations Research

4. Management Systems Engineering

5. Manufacturing Systems

6. Data Analytics

**Proposed 4-letter Abbreviation:** DAAS

**Summary of Proposed Changes:** The Data Analytics (DAAS) concentration option is designed for students who wish to advance their careers in data analytics. The industry-relevant curriculum gives students the skills to extract valuable insights from big data. In this program, students will learn expertise in statistical modeling, data management, machine learning, data visualization, and data-driven decision making related to industrial engineering applications, to meet the growing needs of industry, not-for-profits, government agencies, and other organizations.

Approved:

Date:



3/1/2022

Department Head



3/10/22

Chair, College or School Curriculum Committee



for Jason Keith

3/11/2022

Dean of College or School



3/29/2022

Chair, University Committee on Courses and Curricula



4/1/2022

Chair, Graduate Council (if applicable)



12<sup>th</sup> May, 2022

Chair, Deans Council



MISSISSIPPI STATE UNIVERSITY  
JAMES WORTH  
**BAGLEY**  
COLLEGE OF ENGINEERING

DEPARTMENT OF INDUSTRIAL  
& SYSTEMS ENGINEERING

Linkan Bian, Ph.D.  
bian@ise.msstate.edu

February 25, 2022

University Committee on Courses and Curricula  
Mailstop: 9702  
Mississippi State, MS 39762

Dear UCCC,

The Industrial & Systems Engineering (ISE) faculty and the Graduate Committee support the approval of offering the Data Analytics (DAAS) MS Concentration program via on-campus and distance learning. All classes currently proposed to comprise the MS concentration program either have companion 6000 level sections or are 8000 courses that are approved for campus 1 and 5.

The ISE faculty voted unanimously to accept this new concentration into ISE curriculum offerings on February 25th should it be approved by UCCC.

These approvals are evidenced by the minutes from the ISE February 2022 meeting and the signature from the Graduate Committee Chair below.

Kari Babski-Reeves, PhD, CPE  
Professor and Head  
Industrial and Systems Engineering  
Larry G Brown Endowed Professor  
Associate Dean, Bagley College of Engineering

Linkan Bian, Ph.D.  
Thomas B. & Terri L. Nusz Professor  
Associate Professor  
Graduate Committee Chair  
Industrial and Systems Engineering

**Linkan  
Bian**

Digitally signed  
by Linkan Bian  
Date: 2022.03.01  
08:04:03 -06'00'

### GRADUATE DEGREE MODIFICATION OUTLINE FORM

Use the chart below to make modifications to an existing Graduate Degree. All deleted courses and information should be shown in *italics* and all new courses and information in **bold**. Please include the course prefix, number, and title in both columns. Expand rows as needed.

CURRENT Degree Description	PROPOSED Degree Description
<p>Degree: M.S.            Major: Industrial Engineering            Concentrations: Human Factors and Ergonomics, Industrial Systems, Operations Research, Management Systems Engineering, Manufacturing Systems</p>	<p>Degree: M.S.            Major: Industrial and Systems Engineering            Concentrations: Human Factors and Ergonomics, Industrial Systems, Operations Research, Management Systems Engineering, Manufacturing Systems</p>
<p>Old degree catalog description:</p> <p>Admission Criteria            Typically, an entering M.S. student should have a grade point average of 3.00 out of 4.00 for the junior and senior years. Likewise, an entering Ph.D. student with an M.S. degree should have a 3.50 out of 4.00 grade point average on the M.S. work, while a Ph.D. student entering with only a B.S. degree is expected to have a 3.50 out of 4.00 on the last two years of the undergraduate program. A student with a lower GPA may still be eligible for admission based on outstanding qualifications in other areas. All entering students must submit GRE general-test scores. International students must have a minimum TOEFL score of 550 PBT (79 iBT) or IELTS score of 6.5.            The department reviews completed applications four times a year: February 15, May 15, August 15, and November 15. Incomplete or not fully processed applications will be reviewed during the next cycle.</p> <p>Provisional Admission            An applicant who has not fully met the GPA requirement stipulated by the University may be admitted on a provisional basis. The provisionally-admitted student is eligible for a change to regular status after receiving a 3.00 GPA on the first 9 hours of graduate courses at Mississippi State University (with no grade lower than a C). The first 9 hours of graduate courses must be within the student's Program of Study. Courses with an S grade, transfer credits, or credits earned while in Unclassified status cannot be used to satisfy this requirement. If a 3.00 is not attained, the provisional student <b>shall</b> be dismissed from the graduate program. Academic departments may set higher standards for students to fulfill provisional requirements; a student admitted with provisional status should contact the graduate coordinator for the program's specific requirements. While in the provisional status, a student is not eligible to hold a graduate assistantship.</p> <p>Academic Performance            In addition to the criteria defined in the current Bulletin of the Graduate School, <u>unsatisfactory performance in</u></p>	<p>New degree catalog description:</p> <p>Admission Criteria            Typically, an entering M.S. student should have a grade point average of 3.00 out of 4.00 for the junior and senior years. Likewise, an entering Ph.D. student with an M.S. degree should have a 3.50 out of 4.00 grade point average on the M.S. work, while a Ph.D. student entering with only a B.S. degree is expected to have a 3.50 out of 4.00 on the last two years of the undergraduate program. A student with a lower GPA may still be eligible for admission based on outstanding qualifications in other areas. All entering students must submit GRE general-test scores. International students must have a minimum TOEFL score of 550 PBT (79 iBT) or IELTS score of 6.5.            The department reviews completed applications four times a year: February 15, May 15, August 15, and November 15. Incomplete or not fully processed applications will be reviewed during the next cycle.</p> <p>Provisional Admission            An applicant who has not fully met the GPA requirement stipulated by the University may be admitted on a provisional basis. The provisionally-admitted student is eligible for a change to regular status after receiving a 3.00 GPA on the first 9 hours of graduate courses at Mississippi State University (with no grade lower than a C). The first 9 hours of graduate courses must be within the student's Program of Study. Courses with an S grade, transfer credits, or credits earned while in Unclassified status cannot be used to satisfy this requirement. If a 3.00 is not attained, the provisional student <b>shall</b> be dismissed from the graduate program. Academic departments may set higher standards for students to fulfill provisional requirements; a student admitted with provisional status should contact the graduate coordinator for the program's specific requirements. While in the provisional status, a student is not eligible to hold a graduate assistantship.</p> <p>Academic Performance            In addition to the criteria defined in the current Bulletin of the Graduate School, <u>unsatisfactory performance in</u></p>

the graduate program in Industrial and Systems Engineering is defined as any of the following.

- Failure to maintain a 3.00 average in the M.S. program or 3.30 in the Ph.D. program,
- Failure of the qualifying exam (Ph.D. students only),
- Failure of the preliminary exam (Ph.D. students only);
- Failure of the comprehensive final exam (M.S. non-thesis option only),
- Unsatisfactory evaluation of thesis or dissertation, or
- A failure of the required component of the program of study.

Any one of these will constitute the basis for review for possible dismissal. If the student drops six or more quality points below the required average (3.00 for M.S. or 3.30 for Ph.D.), the graduate coordinator will review the record along with the student's graduate committee and will recommend a final course of action, which will be immediate dismissal or the establishment of a probationary period in which corrective action must take place.

While on probation, the student is not eligible to receive an assistantship and is required to raise his/her cumulative GPA to 3.00 for M.S. or 3.30 for Ph.D. by the end of the following semester of enrollment. During that semester, the student must enroll in 9 credit hours of coursework; Directed Individual Study courses are excluded.

the graduate program in Industrial and Systems Engineering is defined as any of the following.

- Failure to maintain a 3.00 average in the M.S. program or 3.30 in the Ph.D. program,
- Failure of the qualifying exam (Ph.D. students only),
- Failure of the preliminary exam (Ph.D. students only);
- Failure of the comprehensive final exam (M.S. non-thesis option only),
- Unsatisfactory evaluation of thesis or dissertation, or
- A failure of the required component of the program of study.

Any one of these will constitute the basis for review for possible dismissal. If the student drops six or more quality points below the required average (3.00 for M.S. or 3.30 for Ph.D.), the graduate coordinator will review the record along with the student's graduate committee and will recommend a final course of action, which will be immediate dismissal or the establishment of a probationary period in which corrective action must take place.

While on probation, the student is not eligible to receive an assistantship and is required to raise his/her cumulative GPA to 3.00 for M.S. or 3.30 for Ph.D. by the end of the following semester of enrollment. During that semester, the student must enroll in 9 credit hours of coursework; Directed Individual Study courses are excluded.

Old Concentration description:

Master of Science in Industrial Engineering with Human Factors and Ergonomics Concentration (HFE) – Thesis

Prerequisites (foundational courses) are:

- MA 1713
- MA 1723
- MA 2733
- MA 2743
- IE 3123
- IE 4613/6613

IE 6773 Systems Simulation I 3

IE 6623 Engineering Statistics II 3

At least 3 HFE ISE courses 9

IE 8000 Thesis Research/ Thesis in Industrial Engineering 6

At least one non-HFE ISE course 3

New Concentration description:

Master of Science in Industrial Engineering with Human Factors and Ergonomics Concentration (HFE) – Thesis

Prerequisites (foundational courses) are:

- MA 1713
- MA 1723
- MA 2733
- MA 2743
- IE 3123
- IE 4613/6613

IE 6773 Systems Simulation I 3

IE 6623 Engineering Statistics II 3

At least 3 HFE ISE courses 9

IE 8000 Thesis Research/ Thesis in Industrial Engineering 6

At least one non-HFE ISE course 3



At least one course from Mathematics (MA) or Statistics (ST)	3
At least one course from a supporting area (Biological Engineering [ABE], Psychology [PSY], Kinesiology [KI], Mechanical Engineering [ME], Mathematics [MA], Statistics [ST], etc.)	3
<b>Total Hours</b>	<b>30</b>

A thesis and an oral comprehensive examination in defense of the thesis are required.  
 Additional requirements are:

1. A minimum of 12 hours coursework must be at the 8000-level or higher.
2. No ISE graduate student may list ST 8114 or IE 6613 on his/her graduate program
3. No program can contain more than 9 hours of courses that are required in the bachelor's degree curriculum
4. No program can contain more than 6 hours of Directed Individual Study (IE 7000).

The thesis-option Master of Science in Industrial Engineering requires at least 24 credit hours of coursework above the baccalaureate degree. IE 9000 does not apply to M.S. students.

Master of Science in Industrial Engineering with Human Factors and Ergonomics Concentration (HFE) - Non-Thesis

- Prerequisites (foundational courses) are:
- MA 1713
  - MA 1723
  - MA 2733
  - MA 2743
  - IE 3123
  - IE 4613/6613

<u>IE 6773</u> Systems Simulation I	3
<u>IE 6623</u> Engineering Statistics II	3
At least three HFE ISE courses	9
At least two non-HFE ISE courses	6
At least two courses from Mathematics (MA) or Statistics (ST)	6
At least one course from a supporting area (Biological Engineering [ABE], Psychology [PSY], Kinesiology [KI], Mechanical Engineering [ME], Mathematics [MA], Statistics [ST], etc.)	3
<b>Total Hours</b>	<b>30</b>

A written and oral comprehensive final exam on the

At least one course from Mathematics (MA) or Statistics (ST)	3
At least one course from a supporting area (Biological Engineering [ABE], Psychology [PSY], Kinesiology [KI], Mechanical Engineering [ME], Mathematics [MA], Statistics [ST], etc.)	3
<b>Total Hours</b>	<b>30</b>

A thesis and an oral comprehensive examination in defense of the thesis are required.  
 Additional requirements are:

5. A minimum of 12 hours coursework must be at the 8000-level or higher.
6. No ISE graduate student may list ST 8114 or IE 6613 on his/her graduate program
7. No program can contain more than 9 hours of courses that are required in the bachelor's degree curriculum
8. No program can contain more than 6 hours of Directed Individual Study (IE 7000).

The thesis-option Master of Science in Industrial Engineering requires at least 24 credit hours of coursework above the baccalaureate degree. IE 9000 does not apply to M.S. students.

Master of Science in Industrial Engineering with Human Factors and Ergonomics Concentration (HFE) - Non-Thesis

- Prerequisites (foundational courses) are:
- MA 1713
  - MA 1723
  - MA 2733
  - MA 2743
  - IE 3123
  - IE 4613/6613

<u>IE 6773</u> Systems Simulation I	3
<u>IE 6623</u> Engineering Statistics II	3
At least three HFE ISE courses	9
At least two non-HFE ISE courses	6
At least two courses from Mathematics (MA) or Statistics (ST)	6
At least one course from a supporting area (Biological Engineering [ABE], Psychology [PSY], Kinesiology [KI], Mechanical Engineering [ME], Mathematics [MA], Statistics [ST], etc.)	3
<b>Total Hours</b>	<b>30</b>

A written and oral comprehensive final exam on the

coursework. At least 15 hours for the M.S. non-thesis degree must be from 8000-level courses or above. The specific courses required depend upon the student's area of concentration. IE 8000 Research/Thesis does not apply to non-thesis students.

Additional requirements are:

1. No ISE graduate student may list ST 8114 or IE 6613 on his/her graduate program.
2. No program can contain more than 9 hours of courses that are required in the bachelor's degree curriculum.
3. No program can contain more than 6 hours of Directed Individual Study (IE 7000).

The non-thesis Master of Science requires at least 30 credit hours of coursework above the baccalaureate degree. IE 9000 does not apply to M.S. students.

Master of Science in Industrial Engineering with Industrial Systems Concentration (SYS) - Thesis

Prerequisites (foundational courses) are:

- MA 1713
- MA 1723
- MA 2733
- MA 2743
- Computer programming proficiency
- IE 3123
- IE 3913
- IE 4333
- IE 4613/6613

<u>IE 6773</u>	Systems Simulation I	3
<u>IE 8000</u>	Thesis Research/ Thesis in Industrial Engineering	6
All other courses to be selected by the student along with the academic advisor and graduate program committee		21
<b>Total Hours</b>		<b>30</b>

A thesis and an oral comprehensive examination in defense of the thesis are required.

Additional requirements are:

1. A minimum of 12 hours coursework must be at the 8000-level or higher.
2. No ISE graduate student may list ST 8114 or IE 6613 on his/her graduate program.
3. No program can contain more than 9 hours of courses that are required in the bachelor's degree curriculum.
4. No program can contain more than 6 hours of

coursework. At least 15 hours for the M.S. non-thesis degree must be from 8000-level courses or above. The specific courses required depend upon the student's area of concentration. IE 8000 Research/Thesis does not apply to non-thesis students.

Additional requirements are:

4. No ISE graduate student may list ST 8114 or IE 6613 on his/her graduate program.
5. No program can contain more than 9 hours of courses that are required in the bachelor's degree curriculum.
6. No program can contain more than 6 hours of Directed Individual Study (IE 7000).

The non-thesis Master of Science requires at least 30 credit hours of coursework above the baccalaureate degree. IE 9000 does not apply to M.S. students.

Master of Science in Industrial Engineering with Industrial Systems Concentration (SYS) - Thesis

Prerequisites (foundational courses) are:

- MA 1713
- MA 1723
- MA 2733
- MA 2743
- Computer programming proficiency
- IE 3123
- IE 3913
- IE 4333
- IE 4613/6613

<u>IE 6773</u>	Systems Simulation I	3
<u>IE 8000</u>	Thesis Research/ Thesis in Industrial Engineering	6
All other courses to be selected by the student along with the academic advisor and graduate program committee		21
<b>Total Hours</b>		<b>30</b>

A thesis and an oral comprehensive examination in defense of the thesis are required.

Additional requirements are:

5. A minimum of 12 hours coursework must be at the 8000-level or higher.
6. No ISE graduate student may list ST 8114 or IE 6613 on his/her graduate program.
7. No program can contain more than 9 hours of courses that are required in the bachelor's degree curriculum.
8. No program can contain more than 6 hours of

Directed Individual Study (~~IE 7000~~).

The thesis-option Master of Science in Industrial Engineering requires at least 24 credit hours of coursework above the baccalaureate degree. IE 9000 does not apply to M.S. students.

Master of Science in Industrial Engineering with Industrial Systems Concentration (SYS) - Non-Thesis

Prerequisites (foundational courses) are:

- MA 1713
- MA 1723
- MA 2733
- MA 2743
- Computer programming proficiency
- IE 3123
- IE 3913
- IE 4333
- IE 4613/6613

At least 15 hours of 8000-level courses selected by the student along with the academic advisor and grade program committee. 15

Other courses to be selected by the student along with the academic advisor and grade program committee. 15

**Total Hours 30**

A written and oral comprehensive final exam on the coursework. At least 15 hours for the M.S. non-thesis degree must be from 8000-level courses or above. The specific courses required depend upon the student's area of concentration. IE 8000 Research/Thesis does not apply to non-thesis students.

Additional requirements are:

1. No ISE graduate student may list ~~ST 8114~~ or ~~IE 6613~~ on his/her graduate program.
2. No program can contain more than 9 hours of courses that are required in the bachelor's degree curriculum
3. No program can contain more than 6 hours of Directed Individual Study (~~IE 7000~~).

The non-thesis Master of Science requires at least 30 credit hours of coursework above the baccalaureate degree. IE 9000 does not apply to M.S. students.

Master of Science in Industrial Engineering with Management Systems Engineering Concentration (MGTS) – Thesis

Prerequisites (foundational courses) are:

- B.S. in engineering from an ABET-accredited

Directed Individual Study (~~IE 7000~~).

The thesis-option Master of Science in Industrial Engineering requires at least 24 credit hours of coursework above the baccalaureate degree. IE 9000 does not apply to M.S. students.

Master of Science in Industrial Engineering with Industrial Systems Concentration (SYS) - Non-Thesis

Prerequisites (foundational courses) are:

- MA 1713
- MA 1723
- MA 2733
- MA 2743
- Computer programming proficiency
- IE 3123
- IE 3913
- IE 4333
- IE 4613/6613

At least 15 hours of 8000-level courses selected by the student along with the academic advisor and grade program committee. 15

Other courses to be selected by the student along with the academic advisor and grade program committee. 15

**Total Hours 30**

A written and oral comprehensive final exam on the coursework. At least 15 hours for the M.S. non-thesis degree must be from 8000-level courses or above. The specific courses required depend upon the student's area of concentration. IE 8000 Research/Thesis does not apply to non-thesis students.

Additional requirements are:

4. No ISE graduate student may list ~~ST 8114~~ or ~~IE 6613~~ on his/her graduate program.
5. No program can contain more than 9 hours of courses that are required in the bachelor's degree curriculum
6. No program can contain more than 6 hours of Directed Individual Study (~~IE 7000~~).

The non-thesis Master of Science requires at least 30 credit hours of coursework above the baccalaureate degree. IE 9000 does not apply to M.S. students.

Master of Science in Industrial Engineering with Management Systems Engineering Concentration (MGTS) – Thesis

Prerequisites (foundational courses) are:

- B.S. in engineering from an ABET-accredited

program or permission from the MSE Technical Committee		
<ul style="list-style-type: none"> <li>• IE 3913</li> <li>• IE 4613/6613</li> </ul>		
<u>IE 6513</u>	Engineering Administration	3
<u>IE 6533</u>	Project Management	3
<u>IE 6573</u>	Process Improvement Engineering	3
<u>IE 8583</u>	Enterprise Systems Engineering	3
<u>IE 8913</u>	Engineering Economy II	3
<u>IE 8000</u>	Thesis Research/ Thesis in Industrial Engineering	6
At least two non-MSE ISE courses		6
Course to be selected by the student along with academic advisor and graduate program committee		3
<b>Total Hours</b>		<b>30</b>
<p>A thesis and an oral comprehensive examination in defense of the thesis are required.</p> <p>Additional requirements are:</p> <ol style="list-style-type: none"> <li>1. A minimum of 12 hours at the 8000-level is required.</li> <li>2. No ISE graduate student may list <u>ST 8114</u> or <u>IE 6613</u> on his/her graduate program</li> <li>3. No program can contain more than 9 hours of courses that are required in the bachelor's degree curriculum</li> <li>4. No program can contain more than 6 hours of Directed Individual Study (<u>IE 7000</u>).</li> </ol> <p>The thesis-option Master of Science in Industrial Engineering requires at least 24 credit hours of coursework above the baccalaureate degree. IE 9000 does not apply to M.S. students.</p> <p>Master of Science in Industrial Engineering with Management Systems Engineering Concentration (MGTS) - Non-Thesis</p> <p>Prerequisites (foundational courses) are:</p> <ul style="list-style-type: none"> <li>• B.S. in engineering from an ABET-accredited program or permission from the MSE Technical Committee</li> <li>• IE 3913</li> <li>• IE 4613/6613</li> </ul>		
<u>IE 6513</u>	Engineering Administration	3
<u>IE 6533</u>	Project Management	3
<u>IE 6573</u>	Process Improvement Engineering	3
<u>IE 8583</u>	Enterprise Systems Engineering	3

program or permission from the MSE Technical Committee		
<ul style="list-style-type: none"> <li>• IE 3913</li> <li>• IE 4613/6613</li> </ul>		
<u>IE 6513</u>	Engineering Administration	3
<u>IE 6533</u>	Project Management	3
<u>IE 6573</u>	Process Improvement Engineering	3
<u>IE 8583</u>	Enterprise Systems Engineering	3
<u>IE 8913</u>	Engineering Economy II	3
<u>IE 8000</u>	Thesis Research/ Thesis in Industrial Engineering	6
At least two non-MSE ISE courses		6
Course to be selected by the student along with academic advisor and graduate program committee		3
<b>Total Hours</b>		<b>30</b>
<p>A thesis and an oral comprehensive examination in defense of the thesis are required.</p> <p>Additional requirements are:</p> <ol style="list-style-type: none"> <li>5. A minimum of 12 hours at the 8000-level is required.</li> <li>6. No ISE graduate student may list <u>ST 8114</u> or <u>IE 6613</u> on his/her graduate program</li> <li>7. No program can contain more than 9 hours of courses that are required in the bachelor's degree curriculum</li> <li>8. No program can contain more than 6 hours of Directed Individual Study (<u>IE 7000</u>).</li> </ol> <p>The thesis-option Master of Science in Industrial Engineering requires at least 24 credit hours of coursework above the baccalaureate degree. IE 9000 does not apply to M.S. students.</p> <p>Master of Science in Industrial Engineering with Management Systems Engineering Concentration (MGTS) - Non-Thesis</p> <p>Prerequisites (foundational courses) are:</p> <ul style="list-style-type: none"> <li>• B.S. in engineering from an ABET-accredited program or permission from the MSE Technical Committee</li> <li>• IE 3913</li> <li>• IE 4613/6613</li> </ul>		
<u>IE 6513</u>	Engineering Administration	3
<u>IE 6533</u>	Project Management	3
<u>IE 6573</u>	Process Improvement Engineering	3
<u>IE 8583</u>	Enterprise Systems Engineering	3

<u>IE 8913</u>	Engineering Economy II	3
	At least two non-MSE ISE courses	6
	Other courses to be selected by the student along with the academic advisor and graduate program committee	9
<b>Total Hours</b>		<b>30</b>

A written and oral comprehensive final exam on the coursework. At least 15 hours for the M.S. non-thesis degree must be from 8000-level courses or above. The specific courses required depend upon the student's area of concentration. IE 8000 Research/Thesis does not apply to non-thesis students.

Additional requirements are:

1. No ISE graduate student may list ST 8114 or IE 6613 on his/her graduate program
2. No program can contain more than 9 hours of courses that are required in the bachelor's degree curriculum
3. No program can contain more than 6 hours of Directed Individual Study (IE 7000).

The non-thesis Master of Science requires at least 30 credit hours of coursework above the baccalaureate degree. IE 9000 does not apply to M.S. students.

Master of Science in Industrial Engineering with Manufacturing Systems Concentration (MFGS) – Thesis

Prerequisites (foundational courses) are:

- B.S. in engineering from an ABET-accredited program or permission from the Manufacturing Systems Technical Committee
- Computer programming proficiency
- IE 4333/6333
- IE 4613/6613

<u>IE 6653</u>	Industrial Quality Control	3
<u>IE 8333</u>	Production Control Systems II	3
<u>IE 8353</u>	Manufacturing Systems Modeling	3
<u>IE 8000</u>	Thesis Research/ Thesis in Industrial Engineering	6
	At least two Manufacturing Systems ISE courses	6
	At least two non-Manufacturing Systems ISE courses	6
	Course to be selected by the student along with the academic advisor and graduate program committee	3
<b>Total Hours</b>		<b>30</b>

A thesis and an oral comprehensive examination in defense of the thesis are required.

<u>IE 8913</u>	Engineering Economy II	3
	At least two non-MSE ISE courses	6
	Other courses to be selected by the student along with the academic advisor and graduate program committee	9
<b>Total Hours</b>		<b>30</b>

A written and oral comprehensive final exam on the coursework. At least 15 hours for the M.S. non-thesis degree must be from 8000-level courses or above. The specific courses required depend upon the student's area of concentration. IE 8000 Research/Thesis does not apply to non-thesis students.

Additional requirements are:

4. No ISE graduate student may list ST 8114 or IE 6613 on his/her graduate program
5. No program can contain more than 9 hours of courses that are required in the bachelor's degree curriculum
6. No program can contain more than 6 hours of Directed Individual Study (IE 7000).

The non-thesis Master of Science requires at least 30 credit hours of coursework above the baccalaureate degree. IE 9000 does not apply to M.S. students.

Master of Science in Industrial Engineering with Manufacturing Systems Concentration (MFGS) – Thesis

Prerequisites (foundational courses) are:

- B.S. in engineering from an ABET-accredited program or permission from the Manufacturing Systems Technical Committee
- Computer programming proficiency
- IE 4333/6333
- IE 4613/6613

<u>IE 6653</u>	Industrial Quality Control	3
<u>IE 8333</u>	Production Control Systems II	3
<u>IE 8353</u>	Manufacturing Systems Modeling	3
<u>IE 8000</u>	Thesis Research/ Thesis in Industrial Engineering	6
	At least two Manufacturing Systems ISE courses	6
	At least two non-Manufacturing Systems ISE courses	6
	Course to be selected by the student along with the academic advisor and graduate program committee	3
<b>Total Hours</b>		<b>30</b>

A thesis and an oral comprehensive examination in defense of the thesis are required.

Additional requirements are:

1. A minimum of 12 hours coursework must be at the 8000-level or higher.
2. No ISE graduate student may list ST 8114 or IE 6613 on his/her graduate program
3. No program can contain more than 9 hours of courses that are required in the bachelor's degree curriculum
4. No program can contain more than 6 hours of Directed Individual Study (IE 7000).

The thesis-option Master of Science in Industrial Engineering requires at least 24 credit hours of coursework above the baccalaureate degree. IE 9000 does not apply to M.S. students.

Master of Science in Industrial Engineering with Manufacturing Systems Concentration (MFGS) - Non-Thesis

Prerequisites (foundational courses) are:

- B.S. in engineering from an ABET-accredited program or permission from the Manufacturing Systems Technical Committee
- Computer programming proficiency
- IE 4333/6333
- IE 4613/6613

<u>IE 6653</u>	Industrial Quality Control	3
<u>IE 8333</u>	Production Control Systems II	3
<u>IE 8353</u>	Manufacturing Systems Modeling	3
	At least two Manufacturing Systems ISE courses	6
	At least two non-Manufacturing Systems ISE courses	6
	Other courses to be selected by the student along with the academic advisor and graduate program committee	9
<b>Total Hours</b>		<b>30</b>

A written and oral comprehensive final exam on the coursework. At least 15 hours for the M.S. non-thesis degree must be from 8000-level courses or above. The specific courses required depend upon the student's area of concentration. IE 8000 Research/Thesis does not apply to non-thesis students. IE 9000 does not apply to M.S. students.

Additional requirements are:

1. No ISE graduate student may list ST 8114 or IE 6613 on his/her graduate program
2. No program can contain more than 9 hours of courses that are required in the bachelor's degree curriculum

Additional requirements are:

5. A minimum of 12 hours coursework must be at the 8000-level or higher.
6. No ISE graduate student may list ST 8114 or IE 6613 on his/her graduate program
7. No program can contain more than 9 hours of courses that are required in the bachelor's degree curriculum
8. No program can contain more than 6 hours of Directed Individual Study (IE 7000).

The thesis-option Master of Science in Industrial Engineering requires at least 24 credit hours of coursework above the baccalaureate degree. IE 9000 does not apply to M.S. students.

Master of Science in Industrial Engineering with Manufacturing Systems Concentration (MFGS) - Non-Thesis

Prerequisites (foundational courses) are:

- B.S. in engineering from an ABET-accredited program or permission from the Manufacturing Systems Technical Committee
- Computer programming proficiency
- IE 4333/6333
- IE 4613/6613

<u>IE 6653</u>	Industrial Quality Control	3
<u>IE 8333</u>	Production Control Systems II	3
<u>IE 8353</u>	Manufacturing Systems Modeling	3
	At least two Manufacturing Systems ISE courses	6
	At least two non-Manufacturing Systems ISE courses	6
	Other courses to be selected by the student along with the academic advisor and graduate program committee	9
<b>Total Hours</b>		<b>30</b>

A written and oral comprehensive final exam on the coursework. At least 15 hours for the M.S. non-thesis degree must be from 8000-level courses or above. The specific courses required depend upon the student's area of concentration. IE 8000 Research/Thesis does not apply to non-thesis students. IE 9000 does not apply to M.S. students.

Additional requirements are:

4. No ISE graduate student may list ST 8114 or IE 6613 on his/her graduate program
5. No program can contain more than 9 hours of courses that are required in the bachelor's degree curriculum

3. No program can contain more than 6 hours of Directed Individual Study (IE 7000).  
The non-thesis Master of Science requires at least 30 credit hours of coursework above the baccalaureate degree. IE 9000 does not apply to M.S. students.

Master of Science in Industrial Engineering with Operations Research Concentration (OPRS) – Thesis

Prerequisites (foundational courses) are:

- MA 1713
- MA 1723
- MA 2733
- MA 2743
- Computer programming proficiency
- IE 4613/6613

<u>IE 6733</u>	Linear Programming	3
<u>IE 6773</u>	Systems Simulation I	3
<u>IE 8000</u>	Thesis Research/ Thesis in Industrial Engineering	6
	At least two OR ISE courses	6
	At least two non-OR ISE courses	6
	At least one course from Computer Science (CSE), Mathematics (MA), or Statistics (ST)	3
	Course to be selected by the student along with the academic advisor and graduate program committee	3
<b>Total Hours</b>		<b>30</b>

A thesis and an oral comprehensive examination in defense of the thesis are required.

Additional requirements are:

1. A minimum of 12 hours coursework must be at the 8000-level or higher.
2. No ISE graduate student may list ST 8114 or IE 6613 on his/her graduate program
3. No program can contain more than 9 hours of courses that are required in the bachelor's degree curriculum
4. No program can contain more than 6 hours of Directed Individual Study (IE 7000).

The thesis-option Master of Science in Industrial Engineering requires at least 24 credit hours of coursework above the baccalaureate degree. IE 9000 does not apply to M.S. students.

Master of Science in Industrial Engineering with Operations Research Concentration (OPRS) - Non-Thesis

6. No program can contain more than 6 hours of Directed Individual Study (IE 7000).  
The non-thesis Master of Science requires at least 30 credit hours of coursework above the baccalaureate degree. IE 9000 does not apply to M.S. students.

Master of Science in Industrial Engineering with Operations Research Concentration (OPRS) – Thesis

Prerequisites (foundational courses) are:

- MA 1713
- MA 1723
- MA 2733
- MA 2743
- Computer programming proficiency
- IE 4613/6613

<u>IE 6733</u>	Linear Programming	3
<u>IE 6773</u>	Systems Simulation I	3
<u>IE 8000</u>	Thesis Research/ Thesis in Industrial Engineering	6
	At least two OR ISE courses	6
	At least two non-OR ISE courses	6
	At least one course from Computer Science (CSE), Mathematics (MA), or Statistics (ST)	3
	Course to be selected by the student along with the academic advisor and graduate program committee	3
<b>Total Hours</b>		<b>30</b>

A thesis and an oral comprehensive examination in defense of the thesis are required.

Additional requirements are:

5. A minimum of 12 hours coursework must be at the 8000-level or higher.
6. No ISE graduate student may list ST 8114 or IE 6613 on his/her graduate program
7. No program can contain more than 9 hours of courses that are required in the bachelor's degree curriculum
8. No program can contain more than 6 hours of Directed Individual Study (IE 7000).

The thesis-option Master of Science in Industrial Engineering requires at least 24 credit hours of coursework above the baccalaureate degree. IE 9000 does not apply to M.S. students.

Master of Science in Industrial Engineering with Operations Research Concentration (OPRS) - Non-Thesis

Prerequisites (foundational courses) are:

- MA 1713
- MA 1723
- MA 2733
- MA 2743
- Computer programming proficiency
- IE 4613/6613

<u>IE 6733</u>	Linear Programming	3
<u>IE 6773</u>	Systems Simulation I	3
At least two Operations Research ISE courses		6
At least two non-Operations Research ISE courses		6
At least one course com Computer Science (CSE), Mathematics (MA), or Statistics (ST)		3
Courses to be selected by the student along with the academic advisor and graduate program committee		9
<b>Total Hours</b>		<b>30</b>

A written and oral comprehensive final exam on the coursework. At least 15 hours for the M.S. non-thesis degree must be from 8000-level courses or above. The specific courses required depend upon the student's area of concentration. IE 8000 Research/Thesis does not apply to non-thesis students. IE 9000 does not apply to M.S. students.

Additional requirements are:

1. No ISE graduate student may list ST 8114 or IE 6613 on his/her graduate program
2. No program can contain more than 9 hours of courses that are required in the bachelor's degree curriculum
3. No program can contain more than 6 hours of Directed Individual Study (IE 7000).

The non-thesis Master of Science requires at least 30 credit hours of coursework above the baccalaureate degree. IE 9000 does not apply to M.S. students.

Prerequisites (foundational courses) are:

- MA 1713
- MA 1723
- MA 2733
- MA 2743
- Computer programming proficiency
- IE 4613/6613

<u>IE 6733</u>	Linear Programming	3
<u>IE 6773</u>	Systems Simulation I	3
At least two Operations Research ISE courses		6
At least two non-Operations Research ISE courses		6
At least one course com Computer Science (CSE), Mathematics (MA), or Statistics (ST)		3
Courses to be selected by the student along with the academic advisor and graduate program committee		9
<b>Total Hours</b>		<b>30</b>

A written and oral comprehensive final exam on the coursework. At least 15 hours for the M.S. non-thesis degree must be from 8000-level courses or above. The specific courses required depend upon the student's area of concentration. IE 8000 Research/Thesis does not apply to non-thesis students. IE 9000 does not apply to M.S. students.

Additional requirements are:

4. No ISE graduate student may list ST 8114 or IE 6613 on his/her graduate program
5. No program can contain more than 9 hours of courses that are required in the bachelor's degree curriculum
6. No program can contain more than 6 hours of Directed Individual Study (IE 7000).

The non-thesis Master of Science requires at least 30 credit hours of coursework above the baccalaureate degree. IE 9000 does not apply to M.S. students.

#### **Master of Science in Industrial Engineering with Data Analytics Concentration (DAAS) – Thesis**

**The Data Analytics (DAAS) concentration option is designed for students who wish to advance their careers in data analytics. The industry-relevant curriculum gives students the skills to extract valuable insights from big data. In this program, students will learn expertise in statistical modeling, data management, machine learning, data**



visualization, and data-driven decision making related to industrial engineering applications, to meet the growing needs of industry, not-for-profits, government agencies, and other organizations.

Prerequisites (foundational courses) are:

- Calculus 1-4
- IE 4613 Engineering Statistics 1
- MA 3113 Introduction to Linear Algebra
- Computer Programming Proficiency

IE 6623	Engineering Statistics 2	3
IE 6683	Machine Learning with Industrial Engineering Applications	3
IE 8623	Adv Data Analytics	3
At least three ISE elective courses in Data Analytics. See academic advisor for list of approved electives.		9
At least one graduate class from CSE, ECE, or Math/Stat		3
Courses to be selected by the student along with the academic advisor and graduate program committee		3
IE 8000	Thesis in ISE	6
Total Hours		30

The thesis-option Master of Science in Industrial Engineering requires at least 24 credit hours of coursework above the baccalaureate degree. IE 9000 does not apply to M.S. students.

**Master of Science in Industrial Engineering with Data Analytics Concentration (DAAS) – Non-Thesis**

Prerequisites (foundational courses) are:

- Calculus 1-4
- IE 4613 Engineering Statistics 1
- MA 3113 Introduction to Linear Algebra
- Computer Programming Proficiency

IE 6623	Engineering Statistics 2	3
IE 6683	Machine Learning with Industrial Engineering Applications	3
IE 8623	Adv Data Analytics	3

		At least three ISE elective courses in Data Analytics. See academic advisor for list of approved electives.	9
		At least one graduate class from CSE, ECE, or Math/Stat	3
		Courses to be selected by the student along with the academic advisor and graduate program committee	9
		<b>Total Hours</b>	<b>30</b>
		<p>A written and oral comprehensive final exam on the coursework. At least 15 hours for the M.S. non-thesis degree must be from 8000-level courses or above. The specific courses required depend upon the student's area of concentration. IE 8000 Research/Thesis does not apply to non-thesis students. IE 9000 does not apply to M.S. students.</p>	
<b>CURRENT CURRICULUM OUTLINE</b>	Required Hours	<b>PROPOSED CURRICULUM OUTLINE</b>	Required Hours
See above section – Concentration Description and Curriculum Outline/hours are now combined in the Graduate Catalog; therefore, outline is not repeated here.		See above section – Concentration Description and Curriculum Outline/hours are now combined in the Graduate Catalog; therefore, outline is not repeated here.	

APPROVAL FORM FOR  
**DEGREE PROGRAMS**  
MISSISSIPPI STATE UNIVERSITY

NOTE: This form is a cover sheet that must accompany the degree program change proposal. The actual proposal should be prepared in accordance with format requirements provided in the *Guide and Format for Curriculum Proposals* published by the UCCC. Both cover sheet and proposal should be submitted to UCCC Mail Stop 9702 (281 Garner Hall), Phone: 325-9410.

College: Engineering

Department: Electrical and Computer Engineering

Contact Person: Qian Du

Mail Stop: 9571

E-mail: du@ece.msstate.edu

Nature of Change: Ph.D. Admission Date Initiated: Fall 2021 Effective Date: Fall 2022

Current Degree Program Name: Ph.D. in Electrical and Computer Engineering

Major: Electrical and Computer Engineering

Concentration:

New Degree Program Name:

Major:

Concentration:

**Summary of Proposed Changes:**

The ECE department proposes modification of the Ph.D. admission criterion as follows:  
For students with M.S. degrees, "3.25/4.00 GPA on an M.S. degree for admission to the Ph.D. degree program."

There is no change to the curriculum of the Ph.D. program.

Approved:

Date:

  
\_\_\_\_\_  
Department Head

2/28/22  
\_\_\_\_\_

  
\_\_\_\_\_  
Chair, College or School Curriculum Committee

3/10/22  
\_\_\_\_\_

 for Jason Keith  
\_\_\_\_\_  
Dean of College or School

3/11/2022  
\_\_\_\_\_

  
\_\_\_\_\_  
Chair, University Committee on Courses and Curricula

3/30/22  
\_\_\_\_\_

 4/1/2022  
\_\_\_\_\_  
Chair, Graduate Council(if applicable)

  
\_\_\_\_\_  
Chair, Deans Council

12<sup>th</sup> May, 2022  
\_\_\_\_\_

### 1. CATALOG DESCRIPTION

CURRENT Catalog Description	PROPOSED Catalog Description
Admission Criteria <ul style="list-style-type: none"> <li>• 3.00/4.00 GPA on a B.S. degree for admission to the M.S. degree program</li> <li>• 3.50/4.00 GPA on a B.S. or M.S. degree for admission to the Ph.D. degree program</li> </ul>	Admission Criteria <ul style="list-style-type: none"> <li>• 3.00/4.00 GPA on a B.S. degree for admission to the M.S. degree program</li> <li>• <b>3.25/4.00 GPA on an M.S. degree for admission to the Ph.D. degree program</b></li> <li>• <b>3.50/4.00 GPA on a B.S. degree for direct admission to the Ph.D. degree program</b></li> </ul>

### 2. CURRICULUM OUTLINE

There is no change in the ECE Ph.D. curriculum.

CURRENT Degree Description		PROPOSED Degree Description	
Degree: Ph.D. Major: Electrical and Computer Engineering Concentrations: N/A		Degree: Ph.D. Major: Electrical and Computer Engineering Concentrations: N/A	
The Department of Electrical and Computer Engineering at Mississippi State University offers graduate programs of study leading to Doctor of Philosophy (Ph.D.) degrees in Electrical and Computer Engineering (ECE). The graduate degrees are offered by both on-campus study as well as distance education. These programs prepare graduates for leadership roles in the constantly changing activities of research, development, product design, consulting, and education.		The Department of Electrical and Computer Engineering at Mississippi State University offers graduate programs of study leading to Doctor of Philosophy (Ph.D.) degrees in Electrical and Computer Engineering (ECE). The graduate degrees are offered by both on-campus study as well as distance education. These programs prepare graduates for leadership roles in the constantly changing activities of research, development, product design, consulting, and education.	
"[Click here and type old concentration description]" N/A		"[Click here and type new concentration description]"	
CURRENT CURRICULUM OUTLINE	Required Hours	PROPOSED CURRICULUM OUTLINE	Required Hours
College Required Courses		College Required Courses	
Major Required Courses		Major Required Courses	
Ph.D. in ECE:		Ph.D. in ECE:	
ECE 8xxx Graduate-level Courses	12	ECE 8xxx Graduate-level Courses	12
ECE xxxx Additional graduate-level Courses	12	ECE xxxx Additional graduate-level Courses	12
ECE 9000 Dissertation Research	24	ECE 9000 Dissertation Research	24
Ph.D. in ECE – Direct-Admit:		Ph.D. in ECE – Direct-Admit:	
ECE 8xxx Graduate-level Courses	21	ECE 8xxx Graduate-level Courses	21
ECE xxxx Additional graduate-level Courses	21	ECE xxxx Additional graduate-level Courses	21
ECE 9000 Dissertation Research	24	ECE 9000 Dissertation Research	24
Concentration 1. Courses		Concentration 1. Courses	
Concentration 2. Courses		Concentration 2. Courses	
Total Hours		Total Hours	
Ph.D. in ECE	48	Ph.D. in ECE	48
Ph.D. in ECE – Direct-Admit	66	Ph.D. in ECE – Direct-Admit	66

### 3. JUSTIFICATION AND STUDENT LEARNING OBJECTIVES

The ECE faculty would like to reduce the GPA requirement from 3.5 to 3.25 on Ph.D. admission for students with M.S. degree. These students usually have research experience, and admission evaluation should be about the overall academic preparation, including publications, recommendation letters, in addition to GPA. Moreover, most of Ph.D. applications are from international students, whose universities may have different curricula and more rigid grading systems. After considering the Ph.D. admission requirements in our peer and peer plus institutes, we think 3.25 GPA in the M.S. program would be a more reasonable threshold which will help us recruit students with great research potentials for their Ph.D. study.

There is no change to learning outcomes with this admission modification.

Expected Outcomes	Assessment Criteria/Procedures
<p><b>1. Technical knowledge -</b> Graduates will demonstrate technical knowledge that is broad across Electrical and Computer Engineering and deep in their specific area of study.</p>	<p><b>1a. Each student is required to fulfill the Ph.D. qualifier, i.e., earn a 3.5 GPA on the first 18 credit hours of ECE graduate coursework (at least 50% of credit hours must be at 8000-level). The program of study should be approved by the major professor and committee members by the end of the first semester of doctoral enrollment.</b> <b>Criterion: At least 90% of full-time graduates pass the Ph.D. qualifier within the first two years of doctoral enrollment.</b></p> <p><b>1b. Before graduation, each student will orally defend their dissertation to the faculty of their graduate committee. At the dissertation defense, the faculty of the student's graduate committee will complete the ECE Thesis and Dissertation Evaluation Form, a rubric evaluating the areas of technical content and presentation skills on a scale of 1.0 to 5.0.</b> <b>Criterion: At least 80% of graduates will achieve an average score of at least 3.0 on a scale of 1.0 to 5.0 on the technical-content portion of the ECE Thesis and Dissertation Defense Evaluation Form.</b></p>
<p><b>2. Communication of advanced-level research -</b> Graduates will demonstrate ability to communicate advanced-level research that contributes to the profession.</p>	<p><b>2a. At the time of graduation, each student will complete the ECE Graduation Form, a graduation exit survey; each student will list all papers submitted to or published at technical symposia or conferences during their degree studies on the ECE Graduation Form.</b> <b>Criterion: At least 70% of graduates will have published one or more papers at technical symposia or conferences.</b></p> <p><b>2b. At the time of graduation, each student will complete the ECE Graduation Form, a graduation exit survey; each student will list all papers submitted to or published by peer-reviewed journals during their degree studies on the ECE Graduation Form.</b> <b>Criterion: At least 70% of graduates will have submitted one or more papers to peer-reviewed journals.</b></p> <p><b>2c. At the time of graduation, each student will complete the ECE Graduation Form, a graduation exit survey; each student will list all presentations made at technical symposia or conferences.</b> <b>Criterion: At least 70% of graduates will have presented orally one or more papers at technical symposia or conferences.</b></p> <p><b>2d. Before graduation, each student will orally defend their dissertation to the faculty of their graduate committee. At the dissertation defense, the faculty of the student's graduate committee will complete the ECE Thesis and Dissertation Evaluation Form, a rubric evaluating the areas of technical content and presentation skills on a scale of 1.0 to 5.0.</b> <b>Criterion: At least 80% of graduates will achieve an average score of at least 3.0 on a scale of 1.0 to 5.0 on the presentation-skills portion of the ECE Thesis and Dissertation Defense Evaluation Form.</b></p>
<p><b>3. Prepared for professional career -</b></p>	<p><b>3a. At the time of graduation, each student will complete the ECE Graduation Form, a graduation exit survey; each student will indicate their subsequent</b></p>

<p>Graduates will be readily employable in their professional field.</p>	<p>employment status on the ECE Graduation Form. Students who do not indicate subsequent employment on the ECE Graduation Form will be contacted by the departmental graduate program director the summer after their graduation and asked to complete a post-graduation email survey on employment.  <b>Criterion:</b> At least 70% of graduates will have garnered employment at the time of graduation or shortly thereafter.</p> <p>3b. At the time of graduation, each student will complete the ECE Graduation Form, a graduation exit survey; each student will indicate any memberships in professional societies, thereby indicating that they understand the important role that such societies play in introducing new graduates to the professional community as well as in providing resources for lifelong learning and professional development.  <b>Criterion:</b> At least 70% of graduates will be members of the IEEE or other appropriate professional society.</p>
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**4. SUPPORT**

See attached letter from the departmental Graduate Committee.

**5. PROPOSED 4-LETTER ABBREVIATION**

ECPE

**6. EFFECTIVE DATE**

Fall 2022



February 28, 2022

To Whom It May Concern:

The Graduate Committee in the Department of Electrical and Computer Engineering (ECE) is in full support of the proposal of reducing the grade point average (GPA) requirement from 3.5 to 3.25 on Ph.D. admission for students with M.S. degree. We considered fourteen peer and peer plus American universities, and found that our current 3.5 M.S. GPA requirement is the highest and 3.25 GPA would be a more reasonable threshold. The students with M.S. degree often have research experience, and their admission evaluation should be about the overall academic record, including publications, recommendation letters, and GPA. In addition, most of Ph.D. applications are from international students, whose universities may have different curricula and more rigid grading systems. We believe this modification will help the ECE department recruit students with great potentials to succeed in their Ph.D. study.

We wish this proposal of modification would be reviewed favorably. If there is any question, please feel free to contact Dr. Qian (Jenny) Du at [du@ece.msstate.edu](mailto:du@ece.msstate.edu) or 662-325-2035.

Sincerely,

The ECE Graduate Committee

Qian Du (Chair) \_\_\_\_\_

Masoud Karimi \_\_\_\_\_

Chun-Hung Liu \_\_\_\_\_

Chaomin Luo \_\_\_\_\_

Bo Tang \_\_\_\_\_





# Doctor of Philosophy in Engineering, Concentration in Biological Engineering

## Degree Program Modification

### 1. Catalog Description

The proposed modification does not require a change to the catalog description (see below).

### 2. Curriculum Outline

#### DEGREE MODIFICATION OUTLINE FORM

CURRENT Degree Description	PROPOSED Degree Description
Degree: Doctor of Philosophy Major: Biomedical Engineering  Concentration: None	Degree: Doctor of Philosophy Major: Biomedical Engineering  Concentration: None
<p><b>Department Head: Dr. Alex Thomasson</b>  <b>Graduate Coordinator: Dr. Steven Elder</b>                      100 Ag and Bio Engineering Building                      Box 9632                      Mississippi State, MS 39762                      Telephone: (662) 325-3282                      E-mail: <a href="mailto:selder@abe.msstate.edu">selder@abe.msstate.edu</a>                      Website: <a href="http://www.abe.msstate.edu">http://www.abe.msstate.edu</a></p> <p>An Interdisciplinary Curriculum</p> <p>The interdisciplinary Biomedical Engineering program is administered through Agricultural and Biological Engineering for the College of Engineering. Programs of study and research leading to both the Master of Science and the Doctor of Philosophy degrees in Biomedical Engineering are available. Biomedical Engineering is the engineering discipline that applies engineering principles to study and finds solutions for problems associated with the human body, medicine, and the health care field. At MSU, students can concentrate on research in areas such as injury biomechanics and bio-inspired design, computational modeling, vascular calcification, hemodynamics and sickle cell disease, bone fracture healing, and cartilage regeneration.</p> <p>Admission Criteria</p> <p>Regular admission into the M.S. or Ph.D. programs requires the student meet the following criteria:</p>	<p><b>Department Head: Dr. Alex Thomasson</b>  <b>Graduate Coordinator: Dr. Steven Elder</b>                      100 Ag and Bio Engineering Building                      Box 9632                      Mississippi State, MS 39762                      Telephone: (662) 325-3282                      E-mail: <a href="mailto:selder@abe.msstate.edu">selder@abe.msstate.edu</a>                      Website: <a href="http://www.abe.msstate.edu">http://www.abe.msstate.edu</a></p> <p>An Interdisciplinary Curriculum</p> <p>The interdisciplinary Biomedical Engineering program is administered through Agricultural and Biological Engineering for the College of Engineering. Programs of study and research leading to both the Master of Science and the Doctor of Philosophy degrees in Biomedical Engineering are available. Biomedical Engineering is the engineering discipline that applies engineering principles to study and finds solutions for problems associated with the human body, medicine, and the health care field. At MSU, students can concentrate on research in areas such as injury biomechanics and bio-inspired design, computational modeling, vascular calcification, hemodynamics and sickle cell disease, bone fracture healing, and cartilage regeneration.</p> <p>Admission Criteria</p> <p>Regular admission into the M.S. or Ph.D. programs requires the student meet the following criteria:</p>

Meet the admission requirements of the Graduate School

Have earned a bachelor's degree in an engineering discipline

Submit GRE scores

Receive a positive recommendation by the coordinating committee of the biomedical engineering graduate program

Be accepted as a student by a member of the biomedical engineering graduate faculty

The student must have a 3.00 grade point average or higher and, if applicable, a *TOEFL score of 600 PBT (96 iBT) or IELTS score of 7.5 or greater*. A student entering the Ph.D. program should have an M.S. in an engineering discipline. Special consideration may be given to exceptional students with a B.S. degree in engineering who may wish to bypass the M.S. in completing the requirements for the doctoral degree.

#### Provisional Admission

An applicant who has not fully met the GPA requirement stipulated by the University may be admitted on a provisional basis. The provisionally-admitted student is eligible for a change to regular status after receiving a 3.00 GPA on the first 9 hours of graduate courses at Mississippi State University (with no grade lower than a C). The first 9 hours of graduate courses must be within the student's program of study. Courses with an S grade, transfer credits, or credits earned while in Unclassified status cannot be used to satisfy this requirement. If a 3.00 is not attained, the provisional student shall be dismissed from the graduate program. Academic departments may set higher standards for students to fulfill provisional requirements; a student admitted with provisional status should contact the graduate coordinator for the program's specific requirements. While in the provisional status, a student is not eligible to hold a graduate assistantship.

#### Contingent Admission

If a student applying to the M.S. program does not have an undergraduate degree in engineering or an approved C.S. degree, the student will be required to complete approximately 45-48 hours of prerequisite coursework in mathematics, the sciences, or engineering. The student will be granted contingent admission until the course requirement has been satisfied. If a student applying to the Ph.D. program does not have a B.S. or M.S. in engineering or C.S., the same set of 45-48 hours of courses will be required before the student is fully admitted.

Meet the admission requirements of the Graduate School

Have earned a bachelor's degree in an engineering discipline

Submit GRE scores

Receive a positive recommendation by the coordinating committee of the biomedical engineering graduate program

Be accepted as a student by a member of the biomedical engineering graduate faculty

The student must have a 3.00 grade point average or higher and, if applicable, a **TOEFL iBT score of 96 or equivalent**. A student entering the Ph.D. program should have an M.S. in an engineering discipline. Special consideration may be given to exceptional students with a B.S. degree in engineering who may wish to bypass the M.S. in completing the requirements for the doctoral degree.

#### Provisional Admission

An applicant who has not fully met the GPA requirement stipulated by the University may be admitted on a provisional basis. The provisionally-admitted student is eligible for a change to regular status after receiving a 3.00 GPA on the first 9 hours of graduate courses at Mississippi State University (with no grade lower than a C). The first 9 hours of graduate courses must be within the student's program of study. Courses with an S grade, transfer credits, or credits earned while in Unclassified status cannot be used to satisfy this requirement. If a 3.00 is not attained, the provisional student shall be dismissed from the graduate program. Academic departments may set higher standards for students to fulfill provisional requirements; a student admitted with provisional status should contact the graduate coordinator for the program's specific requirements. While in the provisional status, a student is not eligible to hold a graduate assistantship.

#### Contingent Admission

If a student applying to the M.S. program does not have an undergraduate degree in engineering or an approved C.S. degree, the student will be required to complete approximately 45-48 hours of prerequisite coursework in mathematics, the sciences, or engineering. The student will be granted contingent admission until the course requirement has been satisfied. If a student applying to the Ph.D. program does not have a B.S. or M.S. in engineering or C.S., the same set of 45-48 hours of courses will be required before the student is fully admitted.

## Graduate Committees

The graduate committee for each M.S. and Ph.D. student will be composed of a minimum of four and five faculty members, respectively. Faculty members on the graduate Biomedical Engineering faculty hold appointments in departments in the College of Engineering at MSU, the Department of Chemistry at MSU, the Department of Animal and Dairy Sciences at MSU, the College of Veterinary Medicine (CVM) at MSU, and in departments of the University of Mississippi Medical Center (UMMC) in Jackson, Mississippi.

The following requirements for an M.S. graduate committee will apply:

*Chair must be an MSU engineering faculty member*

*One member must be a clinician (CVM faculty, UMC faculty, or practicing clinician)*

*Two or more members must be engineers*

*Two or more members must be MSU faculty members*

The following requirements for a Ph.D. graduate committee will apply:

*Chair must be an MSU engineering faculty member*

*One member must be a clinician (CVM faculty, UMC faculty, or practicing clinician)*

*Three or more members must be engineers*

*Three or more members must be MSU faculty members*

### Academic Performance

Unsatisfactory performance in the graduate program in Biomedical Engineering is defined as any of the following:

Failure to maintain a B average in attempted graduate courses after admission to the program

A grade of D or F in any course

More than two grades below a B

Failure of the qualifying or preliminary exam (Ph.D. students only)

Failure of the thesis/dissertation defense

## Graduate Committees

The graduate committee for each M.S. and Ph.D. student will be composed of a minimum of four and five faculty members, respectively. Faculty members on the graduate Biomedical Engineering faculty hold appointments in departments in the College of Engineering at MSU, the Department of Chemistry at MSU, the Department of Animal and Dairy Sciences at MSU, the College of Veterinary Medicine (CVM) at MSU, and in departments of the University of Mississippi Medical Center (UMMC) in Jackson, Mississippi.

The following requirements for an M.S. graduate committee will apply:

**Chair and at least one other member must be from the Department of Agricultural & Biological Engineering**

**At least three members must hold a Graduate Faculty appointment**

**One member must be a clinician (CVM faculty, UMC faculty, or practicing clinician)**

The following requirements for a Ph.D. graduate committee will apply:

**Chair and at least one other member must be from the Department of Agricultural & Biological Engineering**

**At least three members must hold a Graduate Faculty appointment**

**One member must be a clinician (CVM faculty, UMC faculty, or practicing clinician)**

### Academic Performance

Unsatisfactory performance in the graduate program in Biomedical Engineering is defined as any of the following:

Failure to maintain a B average in attempted graduate courses after admission to the program

A grade of D or F in any course

More than two grades below a B

Failure of the qualifying or preliminary exam (Ph.D. students only)

Failure of the thesis/dissertation defense

**Unsatisfactory evaluation of a thesis or dissertation**

Receiving a second grade of U in ABE 8000 Research/Thesis or ABE 9000 Research/Dissertation (A student who receives a grade of U will be placed on academic probation the following semester. A second grade of U in ABE 8000/9000 in the probationary semester or any thereafter will result in dismissal from the program.)

Any one of these or a combination of these will constitute the basis for review for possible dismissal. The graduate coordinator will review the record along with the student's graduate committee and take a final course of action which will be recommendation for immediate dismissal or the establishment of a probationary period in which corrective action must take place. Appeal of dismissal can be made by submitting a written appeal statement to the department head. If the dismissal is upheld by the department head upon the student's appeal, the student can then submit a written appeal to the dean of the College of Engineering.

**Unsatisfactory evaluation of a thesis or dissertation**

Receiving a second grade of U in ABE 8000 Research/Thesis or ABE 9000 Research/Dissertation (A student who receives a grade of U will be placed on academic probation the following semester. A second grade of U in ABE 8000/9000 in the probationary semester or any thereafter will result in dismissal from the program.)

Any one of these or a combination of these will constitute the basis for review for possible dismissal. The graduate coordinator will review the record along with the student's graduate committee and take a final course of action which will be recommendation for immediate dismissal or the establishment of a probationary period in which corrective action must take place. Appeal of dismissal can be made by submitting a written appeal statement to the department head. If the dismissal is upheld by the department head upon the student's appeal, the student can then submit a written appeal to the dean of the College of Engineering.

**CURRENT CURRICULUM OUTLINE**

Hours

ABE 8621 Methods of Biomedical Engineering Research

1

ABE 8801 Clinical Experience for Biomedical Engineering

1

BIO 6514 Animal Physiology or BIO 6114 Cellular Physiology

4

ST 8114 Statistical Methods

4

8000-level or higher coursework

6

MA XXXX Graduate-level mathematics course<sup>1</sup>

3

Additional graduate-level coursework

29

Dissertation research/dissertation

20-32

Total Hours

80

<sup>1</sup> Or approved substitute, such as an additional graduate level statistics course.

*The Ph.D. degree requires that the student pass a qualifying exam, a preliminary exam, a dissertation defense, and a minimum of 48 coursework hours beyond the B.S., and 20-32 dissertation research*

**PROPOSED CURRICULUM OUTLINE**

Hours

**Beyond the baccalaureate degree**

ABE 8621 Methods of Biomedical Engineering Research

1

ABE 8801 Clinical Experience for Biomedical Engineering

1

BIO 6514 Animal Physiology or BIO 6114 Cellular Physiology

4

ST 8114 Statistical Methods

4

8000-level or higher coursework

6

MA XXXX Graduate-level mathematics course<sup>1</sup>

3

Additional graduate-level coursework

29

Dissertation research/dissertation

20-32

Total Hours

80

**Beyond the master's degree (any discipline of engineering)**

ABE 8621 Methods of Biomedical Engineering Research

1

ABE 8801 Clinical Experience for Biomedical Engineering

1

		BIO 6514 Animal Physiology or BIO 6114 Cellular Physiology	4
		ST 8114 Statistical Methods	4
		8000-level or higher coursework	6
		MA XXXX Graduate-level mathematics course <sup>1</sup>	3
		Additional graduate-level coursework	5
		Dissertation research/dissertation	20-32
		<b>Total Hours</b>	<b>56</b>
		A preliminary examination, a dissertation, and an oral examination in defense of the dissertation are required. Doctoral students are required to take or have credit in a graduate level math course, complete a minimum of 48 credit hours of coursework beyond the baccalaureate degree or a minimum of 24 credit hours of coursework beyond the master's degree, and complete 20-32 hours of dissertation research.	
<i>Total Hours</i>	80	<b>Minimum Total Hours</b>	<b>80 beyond B.S</b>  <b>56 beyond M.S.</b>

### 3. Justification and Student Learning Outcomes

The proposed change will not impact student learning outcomes. It is intended to clarify the degree requirements for current and prospective students who have already earned a master's degree. Twenty-four is the standard GPA credit hour requirement for a Master of Science in engineering with a thesis requirement (total hours = 24 GPA + 6 research/thesis). Thus, the proposed total 24 GPA credit hour requirement beyond the master's degree is equivalent to the 48 GPA credit hour requirement beyond the bachelor's degree. These GPA credit hours are in addition to the required 6 and 20 credit hours of research/thesis/dissertation which are required for the M.S. and Ph.D., respectively.

a. Will this program change result in duplication in the System?

No. The proposed change is a very minor one to an existing program.

- b. Will this program change/advance student diversity within the discipline?

The proposed change is not expected to impact diversity of our graduate student population. We have always promoted participation by students from all national, racial, cultural, and ethnic backgrounds and will continue to do so.

- c. Will this program change result in an increase in the potential placement of graduates in MS, the Southeast, and the U.S.?

The proposed change does not alter the overall curriculum. We hope that it will encourage students with a master's degree to apply to the doctoral program.

- d. Will the program change result in an increase in the potential salaries of graduates in MS, the Southeast, and the U.S.?

The proposed change will not affect potential salaries.

4. Support (see letter attached)
5. Proposed 4-Letter Abbreviation: No change
6. Effective Date: June 2, 2022



# MISSISSIPPI STATE UNIVERSITY

Agricultural and Biological Engineering  
Box 9632  
Mississippi State, MS 39762  
(662) 325-3282 / FAX (662) 325-3853

Date: January 3, 2022

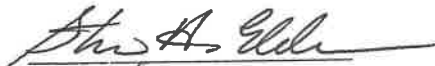
University Committee on Courses and Curricula  
Mailstop: 9702  
Mississippi State, MS 39762

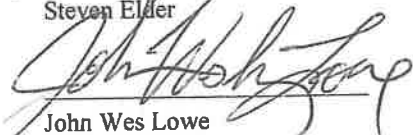
Dear UCCC,

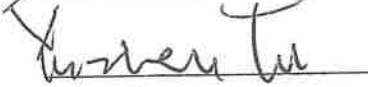
As indicated by our signatures below, we, as faculty members of the Agricultural & Biological Engineering Department, support the proposed change to the GPA credit hour requirement for the Biomedical Engineering Doctor of Philosophy program. We understand the new requirement would be a minimum of 48 credit hours of coursework beyond the baccalaureate degree or a minimum of 24 credit hours of coursework beyond the master's degree.

Sincerely,

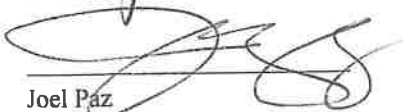
  
Daniel Chesser

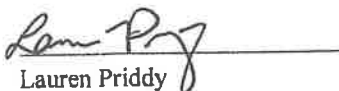
  
Steven Elder

  
John Wes Lowe

  
Yuzhen Lu

  
Prem Parajuli

  
Joel Paz

  
Lauren Priddy

  
Fei Yu

  
C. LaShan Simpson

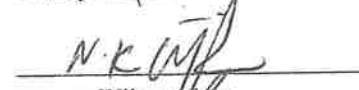
  
Amirtana Taebi


  
Mary Love Tagert

  
J. Alex Thomasson

  
S. D. Filip Ito

  
David Vandenhoeffer

  
Nuwan Wijewardane

  
Xin Zhang





**Approved:**

**Donald L.  
Grebner**

Digitally signed by Donald L.  
Grebner  
Date: 2022.04.05 14:49:19 -05'00'

Department Head

Chair, College or School Curriculum Committee

**Steve Bullard on  
behalf of Wes Burger**

Digitally signed by Steve Bullard  
on behalf of Wes Burger  
Date: 2022.04.08 10:52:32  
-05'00'

Dean of College or School

  
Chair, University Committee on Courses and Curricula

Chair, Graduate Council (if applicable)

  
Chair, Deans Council

**Date:**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

5/2/2022

\_\_\_\_\_

12<sup>th</sup> May, 2022

7. Footnote numbering has been revised so that numbers reset at the beginning of each section.
8. In Social/Behavioral Science (Gen Ed) in the General Education Section, "Business Elective (3) – (BL 2414 [sic] Legal Environment of Business)<sup>2</sup>" was deleted with its associated footnote. BL 2414 [sic] was mistakenly placed here in the 2020 modification and is not an approved Social/Behavioral Science course. The credit hours in this section have also been reduced from 6 to 3.
9. In Major Core Courses, the 3 credit hours for "FO 4113 Forest Resource Economics" were deleted because it is simultaneously listed as a Social/Behavioral Science (Gen Ed) Course in the General Education Section. It remains in the Major Core Courses listing with the footnote "FO 4113 is also used concurrently to meet university social/behavioral sciences requirement."
10. The subtotal for Major Core Courses was corrected from 57 to 54. Previously 3 credits of FO 4113 were counted both here and in the General Education Section. Those 3 credits are now only counted in the General Education Section.
11. In the Environmental Conservation concentration, "MA 1313 College Algebra<sup>1</sup>" has been added to the concentration courses with the footnote "MA 1313 is also used concurrently to meet university math requirement. Three credit hours are counted in general education subtotal." per the edits in #5 above. The credit hours for this course are not listed in the right-hand column because they are included in the subtotal in the General Education section.
12. In the Environmental Conservation concentration, the course name of WFA 3133 has been revised to the new course name "Applied Ecology." The course is the same, only the name has been changed.
13. In the Forest Management concentration, "MA 1313 College Algebra<sup>1</sup>" has been added to the concentration courses with the footnote "MA 1313 is also used concurrently to meet university math requirement. Three credit hours are counted in general education subtotal." per the edits in #5 above. The credit hours for this course are not listed in the right-hand column because they are included in the subtotal in the General Education section.
14. In the Forest Products concentration, "MA 1613 Calculus for Business and Life Sciences I OR MA 1713 Calculus I" has been added to the concentration courses with the footnote "MA 1613 OR MA 1713 is also used concurrently to meet university math requirement. Three credit hours are counted in general education subtotal." to correct for its omission in the previous degree modification and per the edits in #5 above. This course is specifically required for this concentration. The credit hours for this course are not listed in the right-hand column because they are included in the subtotal in the General Education section.
15. In the Forest Products concentration, the course codes FP have been revised to SBP to reflect the change in the department name.
16. In the Urban Forestry concentration, "MA 1313 College Algebra<sup>1</sup>" has been added to the concentration courses with the footnote "MA 1313 is also used concurrently to meet university math requirement. Three credit hours are counted in general education subtotal." per the edits in #5 above. The credit hours for this course are not listed in the right-hand column because they are included in the subtotal in the General Education section.

17. In the Urban Forestry concentration, FO 4473 GIS Nat Res Mgt has been corrected from FO 4472/4471.
18. In the Wildlife Management concentration, "MA 1313 College Algebra<sup>1</sup>" has been added to the concentration courses with the footnote "MA 1313 is also used concurrently to meet university math requirement. Three credit hours are counted in general education subtotal." per the edits in #5 above. The credit hours for this course are not listed in the right-hand column because they are included in the subtotal in the General Education section.
19. In the Wildlife Management concentration, "Physical Science Elective (3)" was deleted because it is already listed in the General Education section per the edits in #4 above. However, it was also identified that "FO 3213 Tree Physiology OR BIO 4214 General Plant Physiology OR WFA 4223 Wildlife Plant Identification OR BIO 4203 Taxonomy of Spermatophytes" had also been omitted in the 2020 modification. These required courses are currently listed in the Undergraduate Catalog for the concentration.
20. In the Wildlife Management concentration, the course name of WFA 3133 has been revised to the new course name "Applied Ecology." The course is the same, only the name has been changed.
21. In the Forest Business concentration, "MA 1313 College Algebra<sup>1</sup>" has been added to the concentration courses with the footnote "MA 1313 is also used concurrently to meet university math requirement. Three credit hours are counted in general education subtotal." per the edits in #5 above. The credit hours for this course are not listed in the right-hand column because they are included in the subtotal in the General Education section.
22. In the Forest Business concentration, "Forest Business Elective" and "Forest Elective" and associated credit hours have been deleted and the "Business Elective" credit hours have been changed from 15-21 to just 21 with the footnote describing the scenario when a business minor may not require all 21 credits and how to fulfill the remaining credits.

## DEGREE MODIFICATION OUTLINE FORM

All deleted courses and information are in *italics* and all new courses and information in **bold**.

CURRENT Degree Description	PROPOSED Degree Description
<p>Degree: Bachelor of Science  Major: Forestry  Concentration: Environmental Concentration; Forest Management, Forest Products, Urban Forestry, Wildlife Management, Forest Business</p>	<p>Degree: Bachelor of Science  Major: Forestry  Concentration: Environmental Concentration; Forest Management, Forest Products, Urban Forestry, Wildlife Management, Forest Business</p>
<p>New degree description:</p> <p>The forestry major is a science-based program leading to a Bachelor of Science degree in Forestry and consists of six concentrations: Environmental Conservation, Forest Management, Forest Products, Urban Forestry, Wildlife Management, and Forest Business Concentration. The Bachelor of Science degree in Forestry is accredited by the Society of American Foresters (SAF). The Forest Products concentration is also accredited by the Society of Wood Science and Technology (SWST). By combining a general education with specialized professional courses, the curriculum is designed to produce graduates who have skills in interpersonal communications, written and oral communications, and cultural understanding. Graduates of the major are qualified to become a Registered Forester in Mississippi after successfully completing an examination for this purpose with the Board of Registration for Foresters (BORF) in Mississippi. Graduates are also qualified to become Society of American Forester Certified Foresters if successfully completing an exam.</p> <p>Graduates are fully qualified as entry-level professionals and prepared for career advancement into positions of responsibility, while serving the current and future needs of society. The forestry major also prepares students for graduate school in any natural resource-related field.</p>	<p>New degree description:</p> <p>The forestry major is a science-based program leading to a Bachelor of Science degree in Forestry and consists of six concentrations: Environmental Conservation, Forest Management, Forest Products, Urban Forestry, Wildlife Management, and Forest Business Concentration. The Bachelor of Science degree in Forestry is accredited by the Society of American Foresters (SAF). The Forest Products concentration is also accredited by the Society of Wood Science and Technology (SWST). By combining a general education with specialized professional courses, the curriculum is designed to produce graduates who have skills in interpersonal communications, written and oral communications, and cultural understanding. Graduates of the major are qualified to become a Registered Forester in Mississippi after successfully completing an examination for this purpose with the Board of Registration for Foresters (BORF) in Mississippi. Graduates are also qualified to become Society of American Forester Certified Foresters if successfully completing an exam.</p> <p>Graduates are fully qualified as entry-level professionals and prepared for career advancement into positions of responsibility, while serving the current and future needs of society. The forestry major also prepares students for graduate school in any natural resource-related field.</p>
<p>Old concentration description:</p> <p><u><i>Environmental Concentration (FO/ENCO)</i></u>  Advisor: Dr. Heidi Renninger, Thompson Hall, room 313</p> <p>Today's forestry professionals strive to balance commodity production with environmental conservation. This concentration is designed for students interested in focusing on complex environmental issues in the realm of natural resource management. While being educated as foresters, students concentrate on contemporary environmental concerns within three emphasis areas: social, land, and science.</p> <p><u><i>Forest Management Concentration (FO/FOMG)</i></u>  Advisor: Dr. Krishna Poudel, Thompson Hall, room 315</p> <p>Designed for students who intend to pursue professional careers in forest land and timber management and use in</p>	<p>New concentration description:</p> <p><u><b>Environmental Conservation Concentration (FO/ENCO)</b></u>  Advisor: Dr. Heidi Renninger, Thompson Hall, room 313</p> <p>Today's forestry professionals strive to balance commodity production with environmental conservation. This concentration is designed for students interested in focusing on complex environmental issues in the realm of natural resource management. While being educated as foresters, students concentrate on contemporary environmental concerns within three emphasis areas: social, land, and science.</p> <p><u><b>Forest Management Concentration (FO/FOMG)</b></u>  Advisor: Dr. Krishna Poudel, Thompson Hall, room 315</p> <p>Designed for students who intend to pursue professional careers in forest land and timber management and use in</p>

both the public and private sectors. Students may select from a wide range of electives to meet specific career objectives; for example, emphasis in areas such as business, communications, and geographical information systems in forestry and related sciences.

Forest Products Concentration (FO/FP)

Advisor: Dr. Joshua Granger, Thompson Hall, room 321

The use of wood as a material requires a fundamental understanding of wood properties, manufacturing processes, and the marketing of wood products. Students are prepared for positions in wood manufacturing, marketing, and research. Employers include lumber, pulp and paper mills, furniture manufacturers, and retail marketers of wood materials.

Urban Forestry Concentration (FO/URBN)

Advisor: Dr. Stephen C. Grado, Thompson Hall, room 357

Addresses an emerging need for the management of trees in towns and cities, and the urban/wildland interface. Urban and community foresters manage trees along city streets, in municipal parks, private woodlots, and utility right-of-ways. Employers include federal, state, and municipal governments, private consultants, and industry.

Wildlife Management Conservation (FO/WFMG)

Advisor: Dr. Heather D. Alexander, Thompson Hall, room 327

Designed for students interested in careers that emphasize wildlife management within the context of multiple-use management of forest land. The concentration fulfills course requirements for certification as wildlife biologists by The Wildlife Society. Many graduates of this concentration undertake graduate studies in wildlife biology and related areas to qualify for entry-level positions as wildlife biologists.

Forest Business Concentration (FO/BUSN)

Advisor: Dr. Robert K. Grala, Thompson Hall, room 343

Designed for students interested in careers that emphasize business aspects of forestry such as timber markets, timber trade, timberland investment and insurance, forest real estate planning and investment, and timber procurement. Students may select from a wide range of electives to meet specific career objectives. Depending on career objectives and learning interests, student will follow a carefully designed set of core courses and electives, and upon coursework completion will qualify for one of the following College of Business minors: accounting, business administration, business information systems, insurance, economics, entrepreneurship, finance,

both the public and private sectors. Students may select from a wide range of electives to meet specific career objectives; for example, emphasis in areas such as business, communications, and geographical information systems in forestry and related sciences.

Forest Products Concentration (FO/FP)

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Wildlife Management Concentration (FO/WFMG)

Advisor: Dr. Austin Himes, Thompson Hall, room 353

Designed for students interested in careers that emphasize wildlife management within the context of multiple-use management of forest land. The concentration fulfills course requirements for certification as wildlife biologists by The Wildlife Society. Many graduates of this concentration undertake graduate studies in wildlife biology and related areas to qualify for entry-level positions as wildlife biologists.

Forest Business Concentration (FO/FOBN)

Advisor: Dr. Robert K. Grala, Thompson Hall, room 343

Designed for students interested in careers that emphasize business aspects of forestry such as timber markets, timber trade, timberland investment and insurance, forest real estate planning and investment, and timber procurement. Students may select from a wide range of electives to meet specific career objectives. Depending on career objectives and learning interests, student will follow a carefully designed set of core courses and electives, and upon coursework completion will qualify for one of the following College of Business minors: accounting, business administration, business information systems, insurance, economics, entrepreneurship, finance, management,



management, marketing, real estate, or business analytics.		marketing, real estate, or business analytics.	
CURRENT CURRICULUM OUTLINE	Required Hours	PROPOSED CURRICULUM OUTLINE	Required Hours
<u>English:</u> EN 1103 English Composition I EN 1113 English Composition II	6	<u>English:</u> EN 1103 English Composition I EN 1113 English Composition II	6
<u>Fine Arts (General Education):</u> Any General Education Course	3	<u>Fine Arts (General Education):</u> Any General Education Course	3
<u>Natural Sciences (2 labs required from Gen Ed):</u> BIO 1134 Biology I BIO 1144 Biology II  See concentrations for additional requirements.	8	<u>Natural Sciences (2 labs required from Gen Ed):</u> BIO 1134 Biology I BIO 1144 Biology II  See concentrations for additional requirements.	8
<u>Extra Science (Chemistry):</u> CH 1043 Survey of Chemistry PH 1113 General Physics or Physical Science Elective (3) depending on a concentration	6	<u>Extra Science (Chemistry):</u> CH 1043 Survey of Chemistry <b>Physical Science Elective (3) or PH 1113 General Physics<sup>1</sup></b>  <sup>1</sup> Applies only to students who select the Forest Products Concentration.	6
<u>Math (General Education):</u> MA 1313 College Algebra ST 2113 Intro to Statistics or BQA 2113 (Business Statistical Methods) <sup>1</sup>  <sup>1</sup> Applies only to students who select the Forest Business Concentration and whose business minor includes a business statistics course. In other cases, students will take ST 2113.	6	<u>Math (General Education):</u> <b>See Concentration (3)</b> ST 2113 Intro to Statistics or BQA 2113 (Business Statistical Methods) <sup>2</sup>  <sup>2</sup> Applies only to students who select the Forest Business Concentration and whose business minor includes a business statistics course. In other cases, students will take ST 2113.	6
<u>Humanities (General Education):</u> Any General Education course.	6	<u>Humanities (General Education):</u> Any General Education course.	6
<u>Social/Behavioral Sciences (Gen Ed):</u> AEC 2713 Intro to Food and Resource Econ <i>Business Elective (3) – (BL 2414 Legal Environment of Business)<sup>2</sup></i> FO 4113 Forest Resource Economics  <sup>2</sup> Applies only to students who select the Forest Business Concentration and whose business minor includes a course qualifying as a substitute for AEC 2713. In other cases, students will take AEC 2713.	6	<u>Social/Behavioral Sciences (Gen Ed):</u> AEC 2713 Intro to Food and Resource Econ  FO 4113 Forest Resource Economics	6
<u>Oral Communication:</u> CO 1003 Fund. Of Public Speaking	3	<u>Oral Communication:</u> CO 1003 Fund. Of Public Speaking	3
<u>Writing:</u> AELC 3203 Prof. Wri in Ag, NR & Hu Sci	3	<u>Writing:</u> AELC 3203 Prof. Wri in Ag, NR & Hu Sci	3
<u>Subtotal</u>	47	<u>Subtotal</u>	47

<p>Major Core Courses<sup>3</sup>:</p> <p>FO 1101 Forest Resource Survey 1  FO 2113 Dendrology 3  FO 2213 Forest Measurements 3  FO 3012 Intro to Forest Communities 2  FO 3015 Forest Descript. and Analysis 5  FO 3103 Computer Appl. For. Res. 3  FO 4113 Forest Resource Economics<sup>4</sup> 3  FO 4123 Forest Ecology 3  FO 4213 Forest Biometrics 3  FO 4221 Practice of Silviculture Lab 1  FO 4223 Practice of Silviculture 3  FO 4231 Intro to Wood Supply Systems 1  FO 4233 For. Op. and Harv. 3  FO 4313 Spatial Tech. in Nat. Res. 3  FO 4323 For. Res. Mgt. 3  FO 4413 Natural Res. Policy 3  FO 4423 Prof. Practice 3  WFA 3031 Intro to Wild. and Fish. Prac. 1  WFA 4153 Prin. Wildlife Cons. and Mgt. 3  PSS 3303 Soils 3  EPP 3124 Forest Pest Management 4</p> <p style="text-align: right;"><u>Subtotal</u> 57</p> <p><sup>3</sup> Pre-requisites and co-requisites are strictly enforced in the College of Forest Resources. It is the student's responsibility to be aware of pre-requisites and co-requisites identified in the Course Description section of the Bulletin.</p> <p><sup>4</sup> FO 4113 is also used concurrently to meet university social/behavioral sciences requirement.</p>		<p>Major Core Courses<sup>3</sup>:</p> <p>FO 1101 Forest Resource Survey 1  FO 2113 Dendrology 3  FO 2213 Forest Measurements 3  FO 3012 Intro to Forest Communities 2  FO 3015 Forest Descript. and Analysis 5  FO 3103 Computer Appl. For. Res. 3  FO 4113 Forest Resource Economics<sup>4</sup> -  FO 4123 Forest Ecology 3  FO 4213 Forest Biometrics 3  FO 4221 Practice of Silviculture Lab 1  FO 4223 Practice of Silviculture 3  FO 4231 Intro to Wood Supply Systems 1  FO 4233 For. Op. and Harv. 3  FO 4313 Spatial Tech. in Nat. Res. 3  FO 4323 For. Res. Mgt. 3  FO 4413 Natural Res. Policy 3  FO 4423 Prof. Practice 3  WFA 3031 Intro to Wild. and Fish. Prac. 1  WFA 4153 Prin. Wildlife Cons. and Mgt. 3  PSS 3303 Soils 3  EPP 3124 Forest Pest Management 4</p> <p style="text-align: right;"><u>Subtotal</u> 54</p> <p><sup>3</sup> Pre-requisites and co-requisites are strictly enforced in the College of Forest Resources. It is the student's responsibility to be aware of pre-requisites and co-requisites identified in the Course Description section of the Bulletin.</p> <p><sup>4</sup> FO 4113 is also used concurrently to meet university social/behavioral sciences requirement.</p>	
<p>Concentration Courses:</p> <p>Courses to be taken in addition to forestry major core curriculum include:</p> <p><u>Environmental Concentration (FO/ENCO)</u>  Advisor: Dr. Heidi Renninger, Thompson Hall, room 313</p> <p>FO 3113 Forest Recreation Mgt. 3  WFA 3133 App Aqua. &amp; Terr. Eco. 3  FO 4453 Remote Sensing Appl. 3  FO 4463 Forest Hydro &amp; Watershed Mgt. 3  Emphasis Elective (14)<sup>4</sup> 14</p>		<p>Concentration Courses:</p> <p>Courses to be taken in addition to forestry major core curriculum include:</p> <p><u>Environmental Conservation Concentration (FO/ENCO)</u>  Advisor: Dr. Heidi Renninger, Thompson Hall, room 313</p> <p>MA 1313 College Algebra<sup>1</sup> -  FO 3113 Forest Recreation Mgt. 3  WFA 3133 Applied Ecology 3  FO 4453 Remote Sensing Appl. 3  FO 4463 Forest Hydro &amp; Watershed Mgt. 3  Emphasis Elective (14)<sup>2</sup> 14</p>	



<p><sup>4</sup>Electives are selected from the list of electives approved by the Department of Forestry faculty.</p>		<p><sup>1</sup>MA 1313 is also used concurrently to meet university math requirement. Three credit hours are counted in general education subtotal.</p>	
<p style="text-align: right;"><u>Subtotal</u> <u>Curriculum Total</u></p>	<p style="text-align: center;">26 127</p>	<p><sup>2</sup>Electives are selected from the list of electives approved by the Department of Forestry faculty.</p>	<p style="text-align: center;"><u>Subtotal</u> <u>Curriculum Total</u></p> <p style="text-align: center;">26 127</p>
<p><u>Forest Management Concentration (FO/FOMG)</u> Advisor: Dr. Krishna Poudel, Thompson Hall, room 315</p>		<p><u>Forest Management Concentration (FO/FOMG)</u> Advisor: Dr. Krishna Poudel, Thompson Hall, room 315</p>	
<p>SBP 1103 Intro to Sustainable Bioproducts 3 FO 3113 Forest Recreation Mgt. 3 Business/Science Elective (9)<sup>4</sup> 9 Professional Elective (9)<sup>4</sup> 9 Free Elective (3)<sup>4</sup> 3</p>		<p>MA 1313 College Algebra<sup>1</sup> - SBP 1103 Intro to Sustainable Bioproducts 3 FO 3113 Forest Recreation Mgt. 3 Business/Science Elective (9)<sup>2</sup> 9 Professional Elective (9)<sup>2</sup> 9 Free Elective (3)<sup>2</sup> 3</p>	
<p><sup>4</sup>Electives are selected from the list of electives approved by the Department of Forestry faculty.</p>		<p><sup>1</sup>MA 1313 is also used concurrently to meet university math requirement. Three credit hours are counted in general education subtotal.</p>	
<p style="text-align: right;"><u>Subtotal</u> <u>Curriculum Total</u></p>	<p style="text-align: center;">27 128</p>	<p><sup>2</sup>Electives are selected from the list of electives approved by the Department of Forestry faculty.</p>	<p style="text-align: center;"><u>Subtotal</u> <u>Curriculum Total</u></p> <p style="text-align: center;">27 128</p>
<p><u>Forest Products Concentration (FO/FP)</u> Advisor: Dr. Joshua Granger, Thompson Hall, room 321</p>		<p><u>Forest Products Concentration (FO/FP)</u> Advisor: Dr. Joshua Granger, Thompson Hall, room 321</p>	
<p>SBP 1103 Intro to Sustainable Bioproducts 3 CH 1053 Survey of Chemistry II 3 FP 4013 Wood Anatomy 3 FP Processing Elective (3)<sup>4</sup> 3 FP Elective (12)<sup>4</sup> 12 SBP 3113 Biomaterial Phy. and Mechanics 3</p>		<p>MA 1613 Calculus for Business and Life Sciences I OR - MA 1713 Calculus I<sup>1</sup> SBP 1103 Intro to Sustainable Bioproducts 3 CH 1053 Survey of Chemistry II 3 SBP 4013 Wood Anatomy 3 SBP Processing Elective (3)<sup>2</sup> 3 SBP Elective (12)<sup>2</sup> 12 SBP 3113 Biomaterial Phy. and Mechanics 3</p>	
		<p><sup>1</sup>MA 1613 OR MA 1713 is also used concurrently to meet university math requirement. Three credit hours are counted in general education subtotal.</p>	

<p><sup>4</sup>Electives are selected from the list of electives approved by the Department of Forestry faculty.</p>		<p><sup>2</sup>Electives are selected from the list of electives approved by the Department of Forestry faculty.</p>	
<p style="text-align: right;"><u>Subtotal</u> <u>Curriculum Total</u></p>	<p style="text-align: right;">27 128</p>	<p style="text-align: right;"><u>Subtotal</u> <u>Curriculum Total</u></p>	<p style="text-align: right;">27 128</p>
<p><u>Urban Forestry Concentration (FO/URBN)</u> Advisor: Dr. Stephen C. Grado, Thompson Hall, room 357</p>		<p><u>Urban Forestry Concentration (FO/URBN)</u> Advisor: Dr. Stephen C. Grado, Thompson Hall, room 357</p>	
<p>PS 1113 American Government 3 PSS 2423 Plant Materials I 3 LA 3623 Urban Planning 3 REF 3333 Principles of Real Estate 3 PSS 3473 Plant Material II 3 FO 3113 Forest Recreation Mgt. 3 PSS 4353 Arboricul. and Landsc. Mainten. 3 FO 4472/4471 GIS Nat. Res. Mgt. + Lab 3 FO 4683 Intro Urban Community Forestry 3</p>		<p>MA 1313 College Algebra<sup>1</sup> 3 PS 1113 American Government 3 PSS 2423 Plant Materials I 3 LA 3623 Urban Planning 3 REF 3333 Principles of Real Estate 3 PSS 3473 Plant Material II 3 FO 3113 Forest Recreation Mgt. 3 PSS 4353 Arboricul. and Landsc. Mainten. 3 FO 4473 GIS Nat Res Mgt 3 FO 4683 Intro Urban Community Forestry</p>	<p>- 3 3 3 3 3 3 3 3 3</p>
<p style="text-align: right;"><u>Subtotal</u> <u>Curriculum Total</u></p>	<p style="text-align: right;">27 128</p>	<p style="text-align: right;"><u>Subtotal</u> <u>Curriculum Total</u></p>	<p style="text-align: right;">27 128</p>
<p><u>Wildlife Management Conservation (FO/WFMG)</u> Advisor: Dr. Heather D. Alexander, Thompson Hall, room 327</p>		<p><u>Wildlife Management Concentration (FO/WFMG)</u> Advisor: Dr. Austin Himes, Thompson Hall, room 353</p>	
<p>Physical Science Elective (3)<sup>4</sup> 3 WFA 3133 Appl. Aqua. &amp; Terr. Ecol. 3 Professional Elective (3)<sup>2</sup> 3 BIO 3524 Biology of Vertebrates 4 WFA 4433 Mammalogy 3 WFA 4443 Ornithology 3 FO 4353 Natural Resource Law 3 WFA 4243 Wildlife Techniques 3</p>		<p>MA 1313 College Algebra<sup>1</sup> 3 FO 3213 Tree Physiology OR 3 BIO 4214 General Plant Physiology OR WFA 4223 Wildlife Plant Identification OR BIO 4203 Taxonomy of Spermatophytes WFA 3133 Applied Ecology 3 Professional Elective (3)<sup>2</sup> 3 BIO 3524 Biology of Vertebrates 4 WFA 4433 Mammalogy 3 WFA 4443 Ornithology 3 FO 4353 Natural Resource Law 3 WFA 4243 Wildlife Techniques 3</p>	<p>- 3 3 3 3 3 3 3 3 3</p>
<p><sup>4</sup>Electives are selected from the list of electives approved by the Department of</p>		<p><sup>1</sup>MA 1313 is also used concurrently to meet university math requirement. Three credit hours are counted in general education subtotal.</p> <p><sup>2</sup>Electives are selected from the list of electives approved by the Department of Forestry</p>	

Forestry faculty.		faculty.	
	<u>Subtotal</u> <u>Curriculum Total</u>		<u>Subtotal</u> <u>Curriculum Total</u>
	25 126		25 126
<u>Forest Business Concentration (FO/BUSN)</u> Advisor: Dr. Robert K. Grala, Thompson Hall, room 343		<u>Forest Business Concentration (FO/FOBN)</u> Advisor: Dr. Robert K. Grala, Thompson Hall, room 343	
SBP 1103 Intro to Sustainable Bioproducts	3	MA 1313 College Algebra <sup>1</sup>	-
FO 3113 Forest Recreation Mgt.	3	SBP 1103 Intro to Sustainable Bioproducts	3
<i>Forest Business Elective<sup>5</sup></i>	0-6	FO 3113 Forest Recreation Mgt.	3
<i>Forest elective</i>	0-6		
Business Elective from the College of Business (from 15 to 21 credit hours depending on a selected business minor)	15-21	Business Elective from the College of Business (from 15 to 21 credit hours depending on a selected business minor) <sup>2</sup>	21
		<b><sup>1</sup>MA 1313 is also used concurrently to meet university math requirement. Three credit hours are counted in general education subtotal.</b>	
		<b><sup>2</sup>If a business minor has a course load less than 21 credit hours required by a minor in business administration (e.g. 18 credit hours required by a minor in finance), a student will substitute the difference in credit hours by enrolling in an additional forest business elective<sup>3</sup>. If a business minor requires less than 18 credit hours (e.g. 15 credit hours required by a minor in real estate), a student will substitute the difference in credit hours by enrolling in an additional forest business elective first and then enrolling in professional electives to maintain the program total of 128 credits hours.</b>	
		<b><sup>3</sup>Electives are selected from the list of electives approved by the Department of Forestry faculty.</b>	
	<u>Subtotal</u> <u>Curriculum Total</u>		<u>Subtotal</u> <u>Curriculum Total</u>
	27 128		27 128

## JUSTIFICATION AND STUDENT LEARNING OUTCOMES

Technical changes listed within represent corrections to the curriculum that were inadvertently changed in a previous modification. No changes to the curriculum are present.

## EFFECTIVE DATE

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MEMO TO: Dr. Andy Perkins, Chair, University Committee on Courses and Curricula (UCCC)

FROM: Dr. Courtney Siegert, Chair, Department of Forestry Undergraduate Curriculum Committee (UGCC)

DATE: March 24, 2022

SUBJECT: Technical Modifications to Forestry Major Curriculum

As per UCCC policy, I am providing documentation that the Department of Forestry's UGCC has reviewed and approved the technical modification changes included within this submission.

The UGCC members have indicated below their approval (or disapproval) of these technical modifications. All Committee members approved the documents that were developed and submitted.

APPROVE

DISAPPROVE

Table with 3 columns: Name, Signature/Stamp, and Approval Status. Rows include Stephen Grado, Robert Grala, Joshua Granger, Austin Himes, Krishna Poudel, Heidi Renninger, Courtney Siegert, and Changyou Sun.