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Dr. John R. Kelly
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Jean Massey, Associate Superintendent of Education for the Office of Career and Technical Education at the Mississippi Department of Education, assembled a taskforce committee to provide input throughout the development of the Agricultural and Natural Resources Curriculum Framework and Supporting Materials.

Brad Skelton, Instructional Design Specialist for the Research and Curriculum Unit at Mississippi State University researched and authored this framework. 
[Bradley.skelton@rcu.msstate.edu]

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The courses in this document reflect the statutory requirements as found in Section 37-3-49, Mississippi Code of 1972, as amended (Section 37-3-46). In addition, this curriculum reflects guidelines imposed by federal and state mandates (Laws, 1988, Ch. 487, §14; Laws, 1991, Ch. 423, §1; Laws, 1992, Ch. 519, §4 eff. from and after July 1, 1992; Carl D. Perkins Vocational Education Act IV, 2007; and No Child Left Behind Act of 2001).
Executive Summary

Pathway Description

Agricultural and Natural Resources is a pathway to introduce the student to the broad field of agriculture and natural resources, including the production of plants and animals and the management of natural resources. The program includes instruction in the applied sciences related to plant and animal production and natural resource conservation and management, as well as introducing the student to agribusiness management practices and maintenance of facilities and equipment. Students in the pathway will participate in active learning exercises including integral activities of the FFA organization and supervised experiences. Students who successfully complete the competencies in this pathway will possess fundamental knowledge and skills that can be used to secure entry-level employment or as a foundation for continuing their education. Industry standards are adapted from the publication Career Cluster Resources for Agriculture, Food, and Natural Resources, developed by the National Association of State Directors of Career and Technical Education.

Industry Certification

No national industry-recognized certifications are known to exist at this time in the field of Agricultural and Natural Resources. Competencies and suggested performance indicators in the horticulture courses have been correlated, however, to the AFNR Career Cluster Content Standards that have been reviewed and endorsed at the national level by the National Council on Agricultural Education.

Assessment

The latest assessment blueprint for the curriculum can be found at http://www.reu.msstate.edu/Curriculum/CurriculumDownload.aspx

Student Prerequisites

In order for students to be able to experience success in the program, the following student prerequisites are suggested:

1. C or higher in Science (the previous year)
2. C or higher in English (the previous year)
3. C or higher in Math (last course taken or the instructor can specify the math)
4. Instructor approval

Applied Academic Credit

The latest academic credit information can be found at http://www.reu.msstate.edu/Curriculum/MDECourseCode.aspx
Once there, click the “MDE Course Code Tool” link, then click “MDE Category” drop-down menu to select your course, next select the correct course code in the “Course Code” drop-down menu, then click “View Report”. Check this site often as it is updated frequently.

Teacher Licensure

The latest teacher licensure information can be found at http://www.mde.k12.ms.us/educator-licensure

Professional Learning

If you have specific questions about the content of any of training sessions provided, please contact the Research and Curriculum Unit at 662.325.2510.
Course Outlines

Option 1—Four One-Carnegie-Unit Courses

This curriculum consists of four one-credit courses, which should be completed in the following sequence:

1. Fundamentals of Agricultural and Natural Resources — Course Code: 991102
2. Agricultural and Natural Resources: Soils and Ag Lab Operations — Course Code: 991103
3. Agricultural and Natural Resources: Environmental Science — Course Code: 991104
4. Agricultural and Natural Resources: Equipment Operation and Business MGT — Course Code: 991105

Course Description: **Fundamentals of Agricultural and Natural Resources** is designed to introduce the student to fundamental concepts and principles of the modern agricultural and natural resources industry. Emphasis is placed on career and leadership skills and basic principles of plant, animal, and soil science.

Course Description: **Agricultural and Natural Resources: Soils and Ag Lab Operations** is designed to provide knowledge and skills concerning basic mechanical technologies in the field.

Course Description: **Agricultural and Natural Resources: Environmental Science** is designed to provide concepts and principles associated with agriculture and natural resources. Emphasis is placed on the conservation and management of natural resources; agricultural business management practices; and the environment as it relates to water quality, forestry, and wildlife.

Course Description: **Agricultural and Natural Resources: Equipment Operation and Business MGT** is designed to provide instruction on basic agriculture construction techniques and agriculture business management and processes.

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<thead>
<tr>
<th>Fundamentals of Agricultural and Natural Resources — Course Code: 991102</th>
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<tr>
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<thead>
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Agricultural and Natural Resources: Environmental Science — Course Code: 991104

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<tr>
<td>12</td>
<td>Science of Forestry and the Environment</td>
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<td>13</td>
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<td>14</td>
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Agricultural and Natural Resources: Equipment Operation and Business MGT — Course Code: 991105

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<th>Unit</th>
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<tr>
<td>15</td>
<td>Construction/Agricultural Equipment Operation and Maintenance</td>
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<tr>
<td>16</td>
<td>Agricultural Business Management and Processes*</td>
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</table>

* Units not MS-CPAS2 tested

Option 2 — Two Two-Carnegie-Unit Courses

This curriculum consists of two two-credit courses, which should be completed in the following sequence:

1. Agricultural and Natural Resources I — Course Code 991100

2. Agricultural and Natural Resources II — Course Code 991101

Course Description: Agricultural and Natural Resources I is designed to introduce the student to fundamental concepts and principles of the modern agricultural and natural resources industry. Emphasis is placed on career and leadership skills; basic principles of plant, animal, and soil science; and basic mechanical technologies in the field. (2–2.5 Carnegie units depending on time spent in course)
**Course Description:** Agricultural and Natural Resources II is designed to continue the exploration of fundamental concepts and principles associated with agriculture and natural resources. Emphasis is placed on the conservation and management of natural resources; agricultural business management practices; and the environment as it relates to water quality, forestry, and wildlife. Instruction is provided on basic agriculture construction techniques and agriculture business management and processes. (2–2.5 Carnegie units depending on time spent in course)

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</tr>
<tr>
<td>2</td>
<td>Agricultural Leadership and Career Development*</td>
<td>15</td>
</tr>
<tr>
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<td>Introduction to Experiential Learning (SAE)*</td>
<td>12</td>
</tr>
<tr>
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<td>Science of Plants</td>
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</tr>
<tr>
<td>6</td>
<td>Soil Science</td>
<td>30</td>
</tr>
<tr>
<td>7</td>
<td>Agricultural Labs Operations and Safety</td>
<td>40</td>
</tr>
<tr>
<td>8</td>
<td>Agricultural Small Engine</td>
<td>30</td>
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### Agricultural and Natural Resources II — Course Code: 991101

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Mike Mulvihill, Bureau Director of Career and Technical Education at the Mississippi Department of Education, provided insight regarding industry/education professionals and provided input throughout the developmental process and implementation of the curriculum framework and supporting materials.

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Executive Summary

Pathway Description
Agricultural and natural resources is a pathway to introduce the student to the broad field of agriculture and natural resources, including the production of plants and animals and the management of natural resources. The program includes instruction in the applied sciences related to plant and animal production and natural resource conservation and management, as well as introducing the student to agribusiness management practices and maintenance of facilities and equipment. Students in the pathway will participate in active learning exercises, including integral activities of the FFA organization and supervised experiences. Students who successfully complete the competencies in this pathway will possess fundamental knowledge and skills that can be used to secure entry-level employment or as a foundation for continuing their education. Industry standards are adapted from Career Cluster Resources for Agriculture, Food, and Natural Resources, developed by the National Association of State Directors of Career and Technical Education.

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No national, industry-recognized certifications are known to exist at this time in the field of agricultural and natural resources. Competencies and suggested performance indicators in the horticulture courses have been correlated, however, to the Agriculture, Food, and Natural Resources Career Cluster Content Standards that have been reviewed and endorsed at the national level by the National Council on Agricultural Education.

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The latest assessment blueprint for the curriculum can be found at http://www.rcu.msstate.edu/Curriculum/CurriculumDownload.aspx.

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In order for students to experience success in the program, the following student prerequisites are suggested:

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The latest academic credit information can be found at http://www.mde.k12.ms.us/ACCRED/AAS.
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Teacher Licensure

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Professional Learning

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Course Outlines

Option 1—Four One-Carnegie Unit Courses

This curriculum consists of four one-credit courses, which should be completed in the following sequence:

5. Fundamentals of Agricultural and Natural Resources—Course Code: 991102
6. Agricultural and Natural Resources: Soils and Ag Lab Operations—Course Code: 991103
7. Agricultural and Natural Resources: Environmental Science—Course Code: 991104
8. Agricultural and Natural Resources: Equipment Operation and Business MGT—Course Code: 991105

Course Description: Fundamentals of Agricultural and Natural Resources is designed to introduce the student to fundamental concepts and principles of the modern agricultural and natural resources industry. Emphasis is placed on career and leadership skills and basic principles of plant, animal, and soil science.

Course Description: Agricultural and Natural Resources: Soils and Ag Lab Operations is designed to provide knowledge and skills concerning basic mechanical technologies in the field.

Course Description: Agricultural and Natural Resources: Environmental Science is designed to provide concepts and principles associated with agriculture and natural resources. Emphasis is placed on the conservation and management of natural resources; agricultural business-management practices; and the environment as it relates to water quality, forestry, and wildlife.

Course Description: Agricultural and Natural Resources: Equipment Operation and Business MGT is designed to provide instruction on basic agriculture-construction techniques and agriculture business-management and processes.
**Fundamentals of Agricultural and Natural Resources**

**Course Code: 991102**

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**Agricultural and Natural Resources: Soils and Ag Lab Operations**

**Course Code: 991103**

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**Agricultural and Natural Resources: Environmental Science**

**Course Code: 991104**

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**Agricultural and Natural Resources: Equipment Operation and Business MGT**

**Course Code: 991105**

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**Option 2—Two Two-Carnegie Unit Courses**
This curriculum consists of two two-credit courses, which should be completed in the following sequence:

3. Agricultural and Natural Resources I—Course Code 991100

4. Agricultural and Natural Resources II—Course Code 991101

**Course Description:** Agricultural and Natural Resources I is designed to introduce the student to fundamental concepts and principles of the modern agricultural and natural resources industry. Emphasis is placed on career and leadership skills; basic principles of plant, animal, and soil science; and basic mechanical technologies in the field. (2–2.5 Carnegie units depending on time spent in course)

**Course Description:** Agricultural and Natural Resources II is designed to continue the exploration of fundamental concepts and principles associated with agriculture and natural resources. Emphasis is placed on the conservation and management of natural resources; agricultural business-management practices; and the environment as it relates to water quality, forestry, and wildlife. Instruction is provided on basic agriculture-construction techniques and agriculture business-management and processes. (2–2.5 Carnegie units depending on time spent in course)

**Agricultural and Natural Resources I —Course Code 991100**

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**Agricultural and Natural Resources II—Course Code: 991101**

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Laveria Green, Natchez Adams Career and Technical Center, Natchez, MS
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Melvin Hodge, Jackson Career Development Center, Jackson, MS
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Student Prerequisites
In order for students to be able to experience success in the program, the following student prerequisites are suggested:

5. C or higher in English (the previous year)

6. C or higher in mathematics (last course taken or the instructor can specify the math)

7. Instructor approval and TABE Reading Score (eighth grade or higher)

or

1. TABE reading score (eighth grade or higher)

2. Instructor approval

or

1. Instructor approval
Academic Credit

The latest academic credit information can be found at http://www.mde.k12.ms.us/ACCRED/AAS. Once there, click the “Mississippi Public School Accountability Standards Year” tab.

Review the appendices for graduation options and superscript information regarding specific programs receiving academic credit.

Check this site often as it is updated frequently.

Teacher Licensure

The latest teacher licensure information can be found at http://www.mde.k12.ms.us/educator-licensure

Professional Learning

If you have specific questions about the content of any of training sessions provided, please contact the Research and Curriculum Unit at 662.325.2510.
Option 1—Four One-Carnegie-Unit Courses

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1. Orientation to Digital Media—Course Code: 994108
2. Fundamentals of Digital Media—Course Code: 994109
3. Theory and Applications of Digital Media I—Course Code: 994110
4. Theory and Applications of Digital Media II—Course Code: 994111

Course Description: Orientation to Digital Media

Orientation to Digital Media includes the foundation skills necessary in the digital media industry. Content such as safety, ethical issues and production, photography, graphic design, and print production will be offered to students. This is a one Carnegie-unit course.

Course Description: Fundamentals of Digital Media

Fundamentals of Digital Media emphasizes real-world, hands-on practice. Content related to audio production will be offered to students. This one-Carnegie-unit course should only be taken after students successfully pass Orientation to Digital Media.

Course Description: Theory and Applications of Digital Media I

Theory and Applications of Digital Media I focuses on career opportunities in video technology, production systems, production process, and video production. This one Carnegie-unit course should only be taken after students successfully pass Fundamentals of Digital Media.

Course Description: Theory and Applications of Digital Media II

Theory and Applications of Digital Media II emphasizes real-world, hands-on practice. Content related to motion graphics will be offered to students. This one Carnegie unit course should only be taken after students successfully pass Theory and Applications of Digital Media I.

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<th>Unit Name</th>
<th>Hours</th>
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Fundamentals of Digital Media—Course Code: 994109

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Theory and Applications of Digital Media I—Course Code: 994110

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<td>12</td>
<td>Designing Effects and Graphics</td>
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<tr>
<td>13</td>
<td>Fundamentals of 3D to Motion Graphics</td>
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Option 2—Two Two-Carnegie-Unit Courses

This curriculum consists of two two-credit courses, which should be completed in the following sequence:

5. Digital Media Technology I—Course Code: 994100

6. Digital Media Technology II—Course Code: 994101

Course Description: Digital Media Technology I

Digital Media Technology I encompasses the foundational skills necessary in the digital media industry. Content such as safety, ethical issues and production, photography, graphic design, and print production will be offered to students. The audio production portion of the course emphasizes real-world, hands-on practice. Students will receive two Carnegie units upon completion of the course.

Course Description: Digital Media Technology II
Digital Media Technology II focuses on the process of video production and editing as well as career opportunities in audio and video technology. Another component of the course is motion graphics. This two-Carnegie-unit course should only be taken after students successfully pass Digital Media Technology I.

**Digital Media Technology I—Course Code: 994100**

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**Digital Media Technology II—Course Code: 994101**

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2018 Digital Media Technology

Program CIP: 09.0702 Digital Communication and Media/Multimedia

Direct inquiries to

Instructional Design Specialist
Research and Curriculum Unit
P.O. Drawer DX
Mississippi State, MS 39762
662.325.2510

Program Coordinator
Office of Career and Technical Education
Mississippi Department of Education
P.O. Box 771
Jackson, MS 39205
601.359.3461

Published by

Office of Career and Technical Education
Mississippi Department of Education
Jackson, MS 39205

Research and Curriculum Unit
Mississippi State University
Mississippi State, MS 39762

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Acknowledgments

The Digital Media Technology curriculum was presented to the Mississippi Board of Education on December 14, 2017. The following persons were serving on the state board at the time:

Dr. Carey M. Wright, State Superintendent of Education
Mrs. Rosemary G. Aultman, Chair
Dr. Jason S. Dean, Vice-Chair
Mr. Buddy Bailey
Mrs. Kami Bumgarner
Dr. Karen Elam
Mr. Johnny Franklin
Dr. John R. Kelly
Mr. Charles McClelland

Jean Massey, Associate Superintendent of Education for the Office of Career and Technical Education at the Mississippi Department of Education, supported the RCU and the teachers throughout the development of the curriculum framework and supporting materials.

Mike Mulvihill, Bureau Director of Career and Technical Education at the Mississippi Department of Education, provided insight regarding industry/education professionals and provided input throughout the developmental process and implementation of the curriculum framework and supporting materials.

Jo Ann Watts, Instructional Design Specialist for the Research and Curriculum Unit at Mississippi State University researched and authored this framework.

jo.watts@rcu.msstate.edu
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Betsey Smith, Associate Director for the Research and Curriculum Unit at Mississippi State University

Scott Kolle, Project Manager for the Research and Curriculum Unit at Mississippi State University

Melissa Luckett, Project Coordinator for the Research and Curriculum Unit at Mississippi State University
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Course Outlines

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2. Fundamentals of Digital Media – Course Code: 994109
3. Theory and Applications of Digital Media I – Course Code: 994110
4. Theory and Applications of Digital Media II – Course Code: 994111

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Theory and Applications of Digital Media I focuses on career opportunities in video technology, production systems, production process, and video production. This one-Carnegie unit course should only be taken after students successfully pass Fundamentals of Digital Media.

Course Description: Theory and Applications of Digital Media II

Theory and Applications of Digital Media II emphasizes real-world, hands-on practice. Content related to motion graphics will be offered to students. This one-Carnegie unit course should only be taken after students successfully pass Theory and Applications of Digital Media I.
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### Fundamentals of Digital Media—Course Code: 994109

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This curriculum consists of two two-credit courses, which should be completed in the following sequence:

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2. Digital Media Technology II—Course Code: 994101

Course Description: Digital Media Technology I

Digital Media Technology I encompasses the foundational skills necessary in the digital media industry. Content such as safety, ethical issues and production, photography, graphic design, and print production will be offered to students. The audio production portion of the course emphasizes real-world, hands-on practice. Students will receive two Carnegie units upon completion of the course.

Course Description: Digital Media Technology II

Digital Media Technology II focuses on the process of video production and editing as well as career opportunities in audio and video technology. Another component of the course is motion graphics. This two-Carnegie unit course should only be taken after students successfully pass Digital Media Technology I.

Digital Media Technology I—Course Code 994100

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2014 Engineering (Core)

Mississippi Department of Education

Program CIP: 14.0101 Engineering, General

Direct inquiries to

Instructional Design Specialist Program Coordinator
Research and Curriculum Unit Office of Career and Technical Education
P.O. Drawer DX Mississippi Department of Education
Mississippi State, MS 39762 P.O. Box 771
662.325.2510 Jackson, MS 39205
601.359.3461

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Acknowledgments

The Engineering curriculum was presented to the Mississippi Board of Education on insert Board date here. The following persons were serving on the state board at the time:

- Dr. Lynn House, Interim State Superintendent of Education
- Dr. O. Wayne Gann, Chair
- Mr. Howell “Hal” N. Gage, Vice Chair
- Ms. Kami Bumgarner
- Mr. William Harold Jones
- Dr. John R. Kelly
- Mr. Charles McClelland
- Mr. Richard Morrison
- Ms. Martha “Jackie” Murphy
- Mr. Simon F. Weir, II

Jean Massey, Associate Superintendent of Education for the Office of Career and Technical Education at the Mississippi Department of Education, supported the RCU and the teachers throughout the development of the curriculum framework and supporting materials.

Kenny Langley, Instructional Design Specialist for the Research and Curriculum Unit at Mississippi State University researched and authored this framework.

kenny.langley@rcu.msstate.edu

Also, special thanks are extended to the teachers who contributed teaching and assessment materials that are included in the framework and supporting materials. Members who contributed are as follows:

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- Clint Brawley, Engineering Instructor, Gulfport School District, Gulfport, MS
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Vemitra White, Bagley College of Engineering, Mississippi State University, Starkville, MS
Chuck Dickerson, Engineering Research and Design Center, U.S. Army Corps of Engineers, Vicksburg, MS
David Creel, Hinds Community College, Raymond, MS
Scott Kolle, Project Manager for the Research and Curriculum Unit at Mississippi State University
Preface

Secondary Career and Technical Education programs in Mississippi are faced with many challenges and opportunities resulting from ongoing educational reforms at the national and state levels. School districts, administrators, and teachers are increasingly being held accountable for providing appropriate and relevant learning activities to every student in the classroom. This accountability is measured through increased requirements for mastery and attainment of competency as documented through both formative and summative assessments. There are also rising calls for more hands-on, applied techniques related to the real world, developing 21st Century skills essential to success in college and career. CTE is well positioned to meet these needs.

The courses in this document reflect the statutory requirements as found in Section 37-3-49, Mississippi Code of 1972, as amended (Section 37-3-46). In addition, this curriculum reflects guidelines imposed by federal and state mandates (Laws, 1988, ch. 487, §14; Laws, 1991, ch. 423, §1; Laws, 1992, ch. 519, §4 eff. from and after July 1, 1992; Carl D. Perkins Vocational Education Act IV, 2007; and Every Student Succeeds Act 2015.)
Executive Summary

Pathway Description
Engineering and Mechatronics is a program in pre-engineering, robotics, and automated manufacturing for high school students. The purpose of the program is to provide pupils with expanded knowledge of the use of critical thinking, analysis, problem solving, and technological skills and to enable them apply knowledge in a technological context. Hands-on experiences related to the application of engineering concepts in the workplace are central to all portions of this course. Students will develop academic, 21st century and human relations skills and competencies that accompany technical skills for job success to help foster lifelong learning. Students who complete the program will be better prepared to enter and succeed in the engineering and STEM-related workforce, or programs offered by Mississippi community and junior colleges and institutions of higher education.

College, Career, and Certifications
Most engineering bachelor's degree programs involve a concentration of study in an engineering specialty along with courses in both mathematics and the physical and life sciences. Many programs also include courses in general engineering. A design course, sometimes accompanied by a computer or laboratory class or both, is part of the curriculum of most programs. General courses not directly related to engineering, such as those in the social sciences or humanities, are also often required.

In addition to the standard bachelors engineering degree, many colleges offer 2-year or 4-year degree programs in engineering technology (ET). These programs, which usually include various hands-on laboratory classes that focus on current issues in the application of engineering principles, prepare students for practical design and production work, rather than for jobs that require more theoretical and scientific knowledge. Graduates of 4-year technology programs may get jobs similar to those obtained by graduates with a bachelor's degree in engineering. Engineering technology graduates, however, are not qualified to register as professional engineers under the same terms as graduates with degrees in engineering. Some employers regard technology program graduates as having skills between those of a technician and an engineer. A two-year study by the National Academy of Engineering (2016) found that despite a high (and increasing) demand for ET graduates in many fields, there “appears to be little awareness of ET as a field of study or a category of employment.” This curriculum attempts to shed some light on these areas as the number of clean, modern, high-tech, and well-paying ET jobs continues to increase in Mississippi, the United States, and internationally.

Although most engineering jobs require a degree, there are some entry-level/base positions that support professionals in engineering and STEM fields that require only certifications. One industry certification example (emphasized in this course) signifies skills in using 3D drafting software and can benefit students applying for jobs in the field. These certifications are applicable in both college and careers. Interested students are encouraged to sharpen and expand upon the skills learned in this course in pursuit of a widely recognized certification. Specific 3D drafting certificates depend on the industry sector or company, but the two most valued certifications for high school students at this point are:

- The Certified SolidWorks Associate—Academic (CSWA—Academic)
• AutoDesk Certified User certificate in AutoDesk Inventor (offered by Certiport)

Assessment

The latest assessment blueprint for the curriculum can be found at http://www.reu.msstate.edu/Curriculum/CurriculumDownload.aspx.

Student Prerequisites

In order for students to experience success in the Engineering program, the following prerequisites are suggested:

1. C or Higher in Pre-Algebra
   and/or
2. TABE Math Computation and TABE Math Applied Score (eighth-grade or higher)
   and/or
3. Instructor Approval

Academic Alignment

The Engineering Curriculum Framework is aligned to the Physics course content in the Mississippi 2018 College and Career Readiness Standards for Science and has been approved by a panel of professional science educators to satisfy academic-equivalent physics credit. The Office of Accreditation has approved the recommendation effective the 2012-2013 school year. The Institutions of Higher Learning the student attends will decide if the equivalent credit can be awarded as a science. *There is a difference between credits recognized for high school graduation by a school district and credits/courses recognized for college acceptance.*

Applied Academic Credit

The latest academic credit information can be found at http://www.mde.k12.ms.us/ACCRED/AAS.

Once there, click the “Mississippi Public School Accountability Standards Year” tab. Review the appendices for graduation options and superscript information regarding specific programs receiving academic credit.

Licensure Requirements

The most current teacher licensure information can be found at http://www.mde.k12.ms.us/educator-licensure.

Professional Learning

If you have specific questions about the content of any of training sessions provided, please contact the Research and Curriculum Unit at 662.325.2510.
**Course Outlines**

**Option 1—Four One-Carnegie-Unit Courses**

This curriculum consists of four one-credit courses, which should be completed in the following sequence:

1. Engineering and Mechatronics Fundamentals—Course Code: 994002
2. Engineering and Mechatronics Industry Skills—Course Code: 994003

Credits 3 and 4 are found in the 2nd year curriculum document.

**Course Description: Engineering and Mechatronics Fundamentals**
Engineering Fundamentals teaches students the history of engineering and the careers associated with the field. Students will learn the foundations and fundamentals of engineering and materials, as well as the engineering design process and the steps one follows for successful design planning. Additionally, students are introduced to the advanced concepts of 3-D sketching and modeling with CAD software. Safe and ethical practices are introduced in this unit and both are expected to be applied throughout all parts of the course.

**Course Description: Engineering and Mechatronics Industry Skills**
Engineering Industry Skills introduces students to professional practice concepts in engineering. It also focuses on several fields of engineering specialization and engineering technology. CAD is emphasized alongside technical writing and analysis.

**Engineering and Mechatronics Fundamentals—Course Code: 994002**

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<th>Hours</th>
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<td>1</td>
<td>Orientation and Student Organizations</td>
<td>10</td>
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<tr>
<td>2</td>
<td>Ethics and Safety</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>Engineering Design Process</td>
<td>15</td>
</tr>
<tr>
<td>4</td>
<td>Computer Aided Design and Drafting-I</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
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**Engineering and Mechatronics Industry Skills—Course Code: 994003**

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<th>Hours</th>
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<td>5</td>
<td>Introduction to Mechanical Systems and Robotics</td>
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</tr>
<tr>
<td>6</td>
<td>Computer Aided Design and Drafting II</td>
<td>25</td>
</tr>
<tr>
<td>7</td>
<td>Engineering Careers and Technical Writing</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>140</td>
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</table>
Option 2—Two Two-Carnegie-Unit Courses

This curriculum consists of two two-credit courses, which should be completed in the following sequence:

1. Engineering and Mechatronics I—Course Code: 994000
2. Credit 2 is found in the 2nd year curriculum document.

Course Description: Engineering and Mechatronics I

Engineering I teaches students about student organizations and introduces them to the engineering design process along with ethical and safe practice standards. Concepts of 3-D sketching and modeling by hand and with CAD software are introduced within the context of engineering design and prototype development. Robotics concepts in engineering are covered with understanding catalyzed by student competitions. It also focuses on several fields of engineering and engineering technology specialization to include technical writing and analysis.

Engineering and Mechatronics I—Course Code: 994000

<table>
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2018 Engineering (Core)

Program CIP: 14.0101-Engineering, General

Direct inquiries to

Instructional Design Specialist  Program Coordinator
Research and Curriculum Unit  Office of Career and Technical Education
P.O. Drawer DX  Mississippi Department of Education
Mississippi State, MS 39762  P.O. Box 771
Jackson, MS 39205  601.359.3461
662.325.2510

Published by

Office of Career and Technical Education
Mississippi Department of Education
Jackson, MS 39205

Research and Curriculum Unit
Mississippi State University
Mississippi State, MS 39762

The Research and Curriculum Unit (RCU), located in Starkville, MS, as part of Mississippi State University, was established to foster educational enhancements and innovations. In keeping with the land grant mission of Mississippi State University, the RCU is dedicated to improving the quality of life for Mississippian. The RCU enhances intellectual and professional development of Mississippi students and educators while applying knowledge and educational research to the lives of the people of the state. The RCU works within the contexts of curriculum development and revision, research, assessment, professional development, and industrial training.
Acknowledgments

The Engineering curriculum was presented to the Mississippi Board of Education on November 9, 2017. The following persons were serving on the state board at the time:

   Dr. Carey M. Wright, State Superintendent of Education
   Mrs. Rosemary G. Aultman, Chair
   Dr. Jason S. Dean, Vice-Chair
   Mr. Buddy Bailey
   Mrs. Kami Bumgarner
   Dr. Karen Elam
   Mr. Johnny Franklin
   Dr. John R. Kelly
   Mr. Charles McClelland

Jean Massey, Associate Superintendent of Education for the Office of Career and Technical Education at the Mississippi Department of Education, supported the RCU and the teachers throughout the development of the curriculum framework and supporting materials.

Mike Mulvihill, Bureau Director of Career and Technical Education at the Mississippi Department of Education, provided insight regarding industry/education professionals and provided input throughout the developmental process and implementation of the curriculum framework and supporting materials.

Kenny Langley, Instructional Design Specialist for the Research and Curriculum Unit at Mississippi State University researched and authored this framework.

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Vemitra White, Bagley College of Engineering, Mississippi State University, Starkville, MS
Chuck Dickerson, Engineering Research and Design Center, U.S. Army Corps of Engineers, Vicksburg, MS
David Creel, Hinds Community College, Raymond, MS
Betsey Smith, Associate Director for the Research and Curriculum Unit at Mississippi State University
Scott Kolle, Project Manager for the Research and Curriculum Unit at Mississippi State University
Melissa Luckett, Project Coordinator for the Research and Curriculum Unit at Mississippi State University
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**Assessment**

The latest assessment blueprint for the curriculum can be found at [http://www.rcu.msstate.edu/Curriculum/CurriculumDownload.aspx](http://www.rcu.msstate.edu/Curriculum/CurriculumDownload.aspx)

**Student Prerequisites**

In order for students to experience success in the Engineering program, the following prerequisites are suggested:

1. A grade of C or Higher in Pre-Algebra
   
   and/or

2. TABE Math Computation and TABE Math Applied Score (eighth grade or higher)
   
   and/or

3. Instructor Approval

**Academic Alignment**

The *Engineering Curriculum Framework* is aligned to the Physics course content in the Mississippi 2018 College and Career Readiness Standards for Science. The Office of Accreditation has approved the recommendation effective the 2012-2013 school year. The Institutions of Higher Learning the student attends will decide if the equivalent credit can be awarded as a science. * Credits recognized for high school graduation by a school district are different from credits/courses recognized for college acceptance.*

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**Licensure Requirements**

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Professional Learning

If you have specific questions about the content of any of training sessions provided, please contact the Research and Curriculum Unit at 662.325.2510 and ask for a professional-learning specialist.
Option 1 – Four One-Carnegie-Unit Courses

This curriculum consists of four one-credit courses, which should be completed in the following sequence:

1. Engineering and Mechatronics Fundamentals—Course Code: 994002
2. Engineering and Mechatronics Industry Skills—Course Code: 994003

Credits 3 and 4 are found in the 2nd year curriculum document.

Course Description: Engineering and Mechatronics Fundamentals

Engineering Fundamentals teaches students the history of engineering and the careers associated with the field. Students will learn the foundations and fundamentals of engineering and materials, as well as the engineering design process and the steps one follows for successful design planning. Additionally, students are introduced to the advanced concepts of 3D sketching and modeling with CAD software. Safe and ethical practices are introduced in this unit and both are expected to be applied throughout all parts of the course.

Course Description: Engineering and Mechatronics Industry Skills

Engineering Industry Skills introduces students to professional practice concepts in engineering. It also focuses on several fields of engineering specialization and engineering technology. CAD is emphasized alongside technical writing and analysis.

Engineering and Mechatronics Fundamentals—Course Code: 994002

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<td>Total</td>
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Engineering and Mechatronics Industry Skills—Course Code: 994003

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Option 2 – Two (2) Two-Carnegie-Unit Courses

This curriculum consists of two (2) two-credit courses, which should be completed in the following sequence:

3. Engineering and Mechatronics I—Course Code: 994000
4. Credit 2 is found in the 2nd year curriculum document.

Course Description: Engineering and Mechatronics I

Engineering I teaches students about student organizations and introduces them to the engineering design process along with ethical and safe practice standards. Concepts of 3D sketching and modeling by hand and with CAD software are introduced within the context of engineering design and prototype development. Robotics concepts in engineering are covered with understanding catalyzed by student competitions. This course also focuses on several fields of engineering and engineering technology specialization to include technical writing and analysis.

Engineering and Mechatronics I—Course Code: 994000

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- Dr. Lynn House, Interim State Superintendent of Education
- Dr. O. Wayne Gann, Chair
- Mr. Howell “Hal” N. Gage, Vice Chair
- Ms. Kami Bumgarner
- Mr. William Harold Jones
- Dr. John R. Kelly
- Mr. Charles McClelland
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College, Career, and Certifications
Most engineering bachelor’s degree programs involve a concentration of study in an engineering specialty along with courses in both mathematics and the physical and life sciences. Many programs also include courses in general engineering. A design course, sometimes accompanied by a computer or laboratory class or both, is part of the curriculum of most programs. General courses not directly related to engineering, such as those in the social sciences or humanities, are also often required.

In addition to the standard bachelors engineering degree, many colleges offer 2-year or 4-year degree programs in engineering technology (ET). These programs, which usually include various hands-on laboratory classes that focus on current issues in the application of engineering principles, prepare students for practical design and production work, rather than for jobs that require more theoretical and scientific knowledge. Graduates of 4-year technology programs may get jobs similar to those obtained by graduates with a bachelor’s degree in engineering. Engineering technology graduates, however, are not qualified to register as professional engineers under the same terms as graduates with degrees in engineering. Some employers regard technology program graduates as having skills between those of a technician and an engineer. A two-year study by the National Academy of Engineering (2016) found that despite a high (and increasing) demand for ET graduates in many fields, there “appears to be little awareness of ET as a field of study or a category of employment.” This curriculum attempts to shed some light on these areas as the number of clean, modern, high-tech, and well-paying ET jobs continues to increase in Mississippi, the United States, and internationally.

Although most engineering jobs require a degree, there are some entry level/base positions that support professionals in engineering and STEM fields that require only certifications. One industry certification example (emphasized in this course) signifies skills in using 3D drafting software and can benefit students applying for jobs in the field. These certifications are applicable in both college and careers. Interested students are encouraged to sharpen and expand upon the skills learned in this course in pursuit of a widely recognized certification. Specific 3D drafting certificates depend on the industry sector or company, but the two most valued certifications for high school students at this point are:

- The Certified SolidWorks Associate—Academic (CSWA—Academic)
• AutoDesk Certified User certificate in AutoDesk Inventor (offered by Certiport)

Assessment

The latest assessment blueprint for the curriculum can be found at [http://www.reu.msstate.edu/Curriculum/CurriculumDownload.aspx](http://www.reu.msstate.edu/Curriculum/CurriculumDownload.aspx)

Student Prerequisites

In order for students to experience success in the Engineering program, the following prerequisites are suggested:

1. C or Higher in Pre-Algebra
   
   and/or

2. TABE Math Computation and TABE Math Applied Score (eighth-grade or higher)
   
   and/or

3. Instructor Approval

Academic Alignment

The *Engineering Curriculum Framework* is aligned to the Physics course content in the Mississippi 2018 College and Career Readiness Standards for Science and has been approved by a panel of professional science educators to satisfy academic-equivalent physics credit. The Office of Accreditation has approved the recommendation effective the 2012-2013 school year. The Institutions of Higher Learning the student attends will decide if the equivalent credit can be awarded as a science.* There is a difference between credits recognized for high school graduation by a school district and credits/courses recognized for college acceptance.*

Applied Academic Credit

The latest academic credit information can be found at [http://www.mde.k12.ms.us/ACCRED/AAS](http://www.mde.k12.ms.us/ACCRED/AAS). Once there, click the “Mississippi Public School Accountability Standards Year” tab. Review the appendices for graduation options and superscript information regarding specific programs receiving academic credit.

Licensure Requirements

The most current teacher licensure information can be found at [http://www.mde.k12.ms.us/educator-licensure](http://www.mde.k12.ms.us/educator-licensure).

Professional Learning

If you have specific questions about the content of any of training sessions provided, please contact the Research and Curriculum Unit at 662.325.2510 and ask for a professional learning specialist.
Option 1—Four One-Carnegie-Unit Courses

This curriculum consists of four one-credit courses, which should be completed in the following sequence:

Credits 1 and 2 are found in the first year curriculum document.


4. Engineering Systems—Course Code: 994005

Course Description: Engineering Manufacturing Concepts

Engineering Manufacturing Concepts teaches students advanced robotic concepts. Students will also learn valuable workforce readiness skills and prepare for jobs in the field of engineering through exploration of advanced 3D drafting and modern manufacturing systems.

Course Description: Engineering Systems

Engineering Systems is a comprehensive course that focuses on the following three systems: electrical, fluid, and thermal. It also obligates students to engage in a large-scale, comprehensive project that requires a display of various skills acquired during their time in the course.

**Engineering Manufacturing Concepts—Course Code: 994004**

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<td>Safety Review</td>
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<td>9</td>
<td>Advanced Computer Aided Design</td>
<td>30</td>
</tr>
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<td>10</td>
<td>Modern Manufacturing Systems</td>
<td>40</td>
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<tr>
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**Engineering Systems—Course Code: 994005**

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<tr>
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</table>
Option 2—Two Two-Carnegie-Unit Courses

This curriculum consists of two two-credit courses, which should be completed in the following sequence:

5. The first year course content is found in the year one curriculum document.

6. Engineering II—Course Code: 994001

Course Description: Engineering II

Engineering II is a comprehensive course that focuses on Advanced CAD modeling and simulations. It also introduces students to modern manufacturing systems, or how robotics and drafting work together to create products. Electrical, fluid, and thermal systems are covered in more detail due to their relevance in real-world applications and industry. Additionally, the course teaches students advanced robotic concepts. Students will also learn valuable workforce readiness skills and prepare for jobs in the field of engineering, which will be demonstrated with all other parts of the course in a capstone unit.

Engineering II—Course Code: 994001

<table>
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<td>Advanced Computer Aided Design</td>
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<td>Modern Manufacturing Systems</td>
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<td>Advanced Robotics</td>
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<td>12</td>
<td>Electrical Systems</td>
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</table>
The Research and Curriculum Unit (RCU), located in Starkville, MS, as part of Mississippi State University, was established to foster educational enhancements and innovations. In keeping with the land grant mission of Mississippi State University, the RCU is dedicated to improving the quality of life for Mississippians. The RCU enhances intellectual and professional development of Mississippi students and educators while applying knowledge and educational research to the lives of the people of the state. The RCU works within the contexts of curriculum development and revision, research, assessment, professional development, and industrial training.
Acknowledgments

The Engineering curriculum was presented to the Mississippi Board of Education on December 14, 2017. The following persons were serving on the state board at the time:

- Dr. Carey M. Wright, State Superintendent of Education
- Mrs. Rosemary G. Aultman, Chair
- Dr. Jason S. Dean, Vice-Chair
- Mr. Buddy Bailey
- Mrs. Kami Bumgarner
- Dr. Karen Elam
- Mr. Johnny Franklin
- Dr. John R. Kelly
- Mr. Charles McClelland

Jean Massey, Associate Superintendent of Education for the Office of Career and Technical Education at the Mississippi Department of Education, supported the RCU and the teachers throughout the development of the curriculum framework and supporting materials.

Mike Mulvihill, Bureau Director of Career and Technical Education at the Mississippi Department of Education, provided insight regarding industry/education professionals and provided input throughout the developmental process and implementation of the curriculum framework and supporting materials.

Kenny Langley, Instructional Design Specialist for the Research and Curriculum Unit at Mississippi State University researched and authored this framework.

kenny.langley@rcu.msstate.edu

Also, special thanks are extended to the teachers who contributed teaching and assessment materials that are included in the framework and supporting materials. Members who contributed are as follows:

- Jennifer Bennett, Engineering Instructor, Calhoun County Schools, Calhoun City, MS
- Clint Brawley, Engineering Instructor, Gulfport School District, Gulfport, MS
- Richard Humphreys, Engineering Instructor, Jackson County Schools, Vancleave, MS
- Bruce Lampe, Engineering Instructor, Lamar County School District, Purvis, MS
- Teresa Sappington, Engineering Instructor, Lamar County School District, Purvis, MS
- Amanda Wood, Engineering Instructor, Tupelo Public School District, Tupelo, MS

Appreciation is expressed to the following professionals who provided guidance and insight throughout the development process:

Bo Clarke and Chris Copelan, National Aeronautics and Space Administration, Hancock County, MS
Gino Perkins and Steven Thompson, Nissan USA, Canton, MS

Greg Stewart, Aurora Flight Sciences, Columbus, MS

John O’Haver, Center for Mathematics and Science Education, University of Mississippi, Oxford, MS

Wilbur Walters, College of Science, Engineering and Technology, Jackson State University, Jackson, MS

Kevin McKone, Copiah-Lincoln Community College, Wesson, MS

Rick Saucier, Hancock County Schools, Kiln, MS

Victor Branch, Mississippi State University Center for Advanced Vehicular Systems, Canton, MS

Vemitra White, Bagley College of Engineering, Mississippi State University, Starkville, MS

Chuck Dickerson and Eddie Melton, Engineering Research and Design Center, U.S. Army Corps of Engineers, Vicksburg, MS

David Creel and Chad Stocks, Hinds Community College, Raymond, MS

Betsey Smith, Associate Director for the Research and Curriculum Unit at Mississippi State University

Scott Kolle, Project Manager for the Research and Curriculum Unit at Mississippi State University

Melissa Luckett, Project Coordinator for the Research and Curriculum Unit at Mississippi State University
Secondary Career and Technical Education programs in Mississippi are faced with many challenges and opportunities resulting from ongoing educational reforms at the national and state levels. School districts, administrators, and teachers are increasingly being held accountable for providing appropriate and relevant learning activities to every student in the classroom. This accountability is measured through increased requirements for mastery and attainment of competency as documented through both formative and summative assessments. There are also rising calls for more hands-on, applied techniques related to the real world, developing 21st Century skills essential to success in college and career. CTE is well positioned to meet these needs.

The courses in this document reflect the statutory requirements as found in Section 37-3-49, Mississippi Code of 1972, as amended (Section 37-3-46). In addition, this curriculum reflects guidelines imposed by federal and state mandates (Laws, 1988, ch. 487, §14; Laws, 1991, ch. 423, §1; Laws, 1992, ch. 519, §4 eff. from and after July 1, 1992; Carl D. Perkins Vocational Education Act IV, 2007; and Every Student Succeeds Act 2015.)
Executive Summary

Pathway Description
Engineering and Mechatronics is a program in pre-engineering, robotics, and automated manufacturing for high school students. The purpose of the program is to provide pupils with expanded knowledge of the use of critical thinking, analysis, problem solving, and technological skills and to enable them to apply knowledge in a technological context. Hands-on experiences related to the application of engineering concepts in the workplace are central to all portions of this course. Students will develop academic, 21st century, and human relations skills and competencies that accompany technical skills for job success to help foster lifelong learning. Students who complete the program will be better prepared to enter and succeed in the engineering and STEM-related workforce or programs offered by Mississippi community and junior colleges, as well as institutions of higher education.

College, Career, and Certifications
Most engineering bachelor’s degree programs involve a concentration of study in an engineering specialty along with courses in both mathematics and the physical and life sciences. Many programs also include courses in general engineering. A design course, sometimes accompanied by a computer or laboratory class or both, is part of the curriculum of most programs. General courses not directly related to engineering, such as those in the social sciences or humanities, are also often required.

In addition to the standard bachelor’s engineering degree, many colleges offer 2-year or 4-year degree programs in engineering technology (ET). These programs, which usually include various hands-on laboratory classes that focus on current issues in the application of engineering principles, prepare students for practical design and production work, rather than for jobs that require more theoretical and scientific knowledge. Graduates of 4-year technology programs may get jobs similar to those obtained by graduates with a bachelor’s degree in engineering. Engineering technology graduates, however, are not qualified to register as professional engineers under the same terms as graduates with degrees in engineering. Some employers regard technology program graduates as having skills between those of a technician and an engineer. A two-year study by the National Academy of Engineering (2016) found that despite a high (and increasing) demand for ET graduates in many fields, there “appears to be little awareness of ET as a field of study or a category of employment.” This curriculum attempts to shed some light on these areas as the number of clean, modern, high-tech, and well-paying ET jobs continues to increase in Mississippi, the United States, and internationally.

Although most engineering jobs require a degree, some entry level/base positions that support professionals in engineering and STEM fields require only certifications. One industry certification example (emphasized in this course) signifies skills in using 3D drafting software and can benefit students applying for jobs in the field. These certifications are applicable in both
college and careers. Interested students are encouraged to sharpen and expand upon the skills
learned in this course in pursuit of a widely recognized certification. Specific 3D drafting
certificates depend on the industry sector or company, but the two most valued certifications for
high school students at this point are:

- The Certified SolidWorks Associate - Academic (CSWA - Academic)
- AutoDesk Certified User certificate in AutoDesk Inventor (offered by Certiport)

Assessment

The latest assessment blueprint for the curriculum can be found at
http://www.rcu.msstate.edu/Curriculum/CurriculumDownload.aspx

Student Prerequisites

In order for students to experience success in the Engineering program, the following
prerequisites are suggested:

1. A grade of C or Higher in Pre-Algebra
   and/or
2. TABE Math Computation and TABE Math Applied Score (eighth grade or higher)
   and/or
3. Instructor Approval

Academic Alignment

The Engineering Curriculum Framework is aligned to the Physics course content in the
Mississippi 2018 College and Career Readiness Standards for Science. The Office of
Accreditation has approved the recommendation effective the 2012-2013 school year. The
Institutions of Higher Learning the student attends will decide if the equivalent credit can be
awarded as a science. * Credits recognized for high school graduation by a school district are
different from credits/courses recognized for college acceptance.*

Applied Academic Credit

The latest academic credit information can be found at
http://www.mde.k12.ms.us/ACCRED/AAS.

Once there, click the “Mississippi Public School Accountability Standards Year” tab.
Review the appendices for graduation options and superscript information regarding specific
programs receiving academic credit.

Licensure Requirements
The most current teacher licensure information can be found at http://www.mde.k12.ms.us/educator-licensure.

**Professional Learning**

If you have specific questions about the content of any of training sessions provided, please contact the Research and Curriculum Unit at 662.325.2510 and ask for a professional-learning specialist.
Option 1 – Four One-Carnegie-Unit Courses

This curriculum consists of four one-credit courses, which should be completed in the following sequence:

Credits 1 and 2 are found in the first year curriculum document.


4. Engineering Systems —Course Code: 994005

Course Description: Engineering Manufacturing Concepts

Engineering Manufacturing Concepts teaches students advanced robotic concepts. Students will also learn valuable workforce readiness skills and prepare for jobs in the field of engineering through exploration of advanced 3D drafting and modern manufacturing systems.

Course Description: Engineering Systems

Engineering Systems is a comprehensive course that focuses on the following three systems: electrical, fluid, and thermal. It also obligates students to engage in a large-scale, comprehensive project that requires a display of various skills acquired during their time in the course.

Engineering Manufacturing Concepts—Course Code: 994004

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<th>Hours</th>
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<td>Safety Review</td>
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</tr>
<tr>
<td>9</td>
<td>Advanced Computer Aided Design</td>
<td>20</td>
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<td>Modern Manufacturing Systems</td>
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<td>11</td>
<td>Advanced Robotics</td>
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Engineering Systems—Course Code: 994005

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<td>13</td>
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<tr>
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<td>Thermal Systems</td>
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</tr>
<tr>
<td>15</td>
<td>Capstone</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
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</tbody>
</table>
Option 2 – Two (2) Two-Carnegie-Unit Courses

This curriculum consists of two (2) two-credit courses, which should be completed in the following sequence:

1. The first year course content is found in the year one curriculum document.

2. Engineering II—Course Code: 994001

Course Description: Engineering II

Engineering II is a comprehensive course that focuses on Advanced CAD modeling and simulations. It also introduces students to modern manufacturing systems, or how robotics and drafting work together to create products. Electrical, fluid, and thermal systems are covered in more detail due to their relevance in real-world applications and industry. Additionally, the course teaches students advanced robotic concepts. Students will also learn valuable workforce readiness skills and prepare for jobs in the field of engineering, which will be demonstrated with all other parts of the course in a capstone unit.

**Engineering II—Course Code: 994001**

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2018 Introduction to Agriscience
Mississippi Department of Education

Program CIP: 01.0001—Introduction to Agriscience

Direct inquiries to

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Research and Curriculum Unit
Mississippi State University
Mississippi State, MS 39762

Betsey Smith, Curriculum Manager
Scott Kolle, Project Manager
Jolanda Harris, Educational Technologist

The Research and Curriculum Unit (RCU), located in Starkville, MS, as part of Mississippi State University, was established to foster educational enhancements and innovations. In keeping with the land-grant mission of Mississippi State University, the RCU is dedicated to improving the quality of life for Mississippians. The RCU enhances intellectual and professional development of Mississippi students and educators while applying knowledge and educational research to the
lives of the people of the state. The RCU works within the contexts of curriculum development and revision, research, assessment, professional development, and industrial training.

Acknowledgments

The Introduction to Agriscience curriculum was presented to the Mississippi Board of Education on insert MDE Board date here. The following persons were serving on the state board at the time:

- Dr. Carey M. Wright, State Superintendent of Education
- Dr. John R. Kelly, Chair
- Mr. Richard Morrison, Vice Chair
- Dr. O. Wayne Gann
- Mrs. Kami Bumgarner
- Mr. William Harold Jones
- Mr. Charles McClelland
- Mrs. Rosemary G. Aultman
- Mr. Johnny Franklin
- Dr. Karen Elam

Jean Massey, Associate Superintendent of Education for the Office of Career and Technical Education at the Mississippi Department of Education, supported the RCU and the teachers throughout the development of the curriculum framework and supporting materials.

Brad Skelton, Instructional Design Specialist for the Research and Curriculum Unit at Mississippi State University researched and authored this framework. [Bradley.skelton@rcu.msstate.edu](mailto:Bradley.skelton@rcu.msstate.edu)

Also, special thanks are extended to the teachers who contributed teaching and assessment materials that are included in the framework and supporting materials:

- Shelby Aulds, Houston Middle School, Houston, MS
- Jerry Clifton, Benton County Career and Technical Center, Ashland, MS
- Chess Jackson, Tylertown High School, Tylertown, MS
- Bob Robinson, Pelahatchie High School, Pelahatchie, MS
- Kramer Sowell, Brandon High School, Brandon, MS
- Billy Thacker, Water Valley High School, Water Valley, MS
- West Watkins, Nanih Waiya Attendance Center, Louisville, MS

Appreciation is expressed to the following professional, who provided guidance and insight throughout the development process:

- Lee James, Program Coordinator—Agriculture, Office of Career and Technical Education and
Workforce Development, Mississippi Department of Education, Jackson, MS

Betsey Smith, Associate Director for the Research and Curriculum Unit at Mississippi State University

Scott Kolle, Project Manager for the Research and Curriculum Unit at Mississippi State University

Jolanda Young, Educational Technologist for the Research and Curriculum Unit at Mississippi State University
Preface

Secondary career and technical education programs in Mississippi face many challenges resulting from sweeping educational reforms at the national and state levels. Schools and teachers are increasingly being held accountable for providing true learning activities to every student in the classroom. This accountability is measured through increased requirements for mastery and attainment of competency as documented through both formative and summative assessments.

The courses in this document reflect the statutory requirements as found in Section 37-3-49, Mississippi Code of 1972, as amended (Section 37-3-46). In addition, this curriculum reflects guidelines imposed by federal and state mandates (Laws, 1988, Ch. 487, §14; Laws, 1991, Ch. 423, §1; Laws, 1992, Ch. 519, §4 eff. from and after July 1, 1992; Carl D. Perkins Vocational Education Act IV, 2007; and No Child Left Behind Act of 2001).
Executive Summary

Course Description
The Introduction to Agriscience course introduces students to the broad field of agriculture, biotechnology, and natural resources, including the production of plants and animals and the management of natural resources. The program includes instruction in the applied sciences related to plant and animal production and natural resource conservation and management, as well as introduces agribusiness management practices and maintenance of facilities and equipment. Students in the course will participate in active learning exercises, including integral activities of the FFA organization and supervised experiences. Students who successfully complete the competencies in this course will possess fundamental knowledge and skills that can be used to secure entry-level employment or as a foundation for continuing their education. Industry standards are adapted from Career Cluster Resources for Agriculture, Food, and Natural Resources, a publication developed by the National Association of State Directors of Career and Technical Education.

Industry Certification
No national industry-recognized certifications are known to exist at this time. However, competencies and suggested performance indicators in the Introduction to Agriscience course have been correlated to the National Agriculture, Food, and Natural Resources (AFNR) Career Cluster Content Standards that have been reviewed and endorsed at the national level by the National Council on Agricultural Education.
Student Prerequisites

In order for students to be able to experience success in the Introduction to Agriscience course, the following prerequisites are in place:

1. C or higher in English (the previous year)
2. C or higher in Math (last course taken or the instructor can specify the math)
3. Instructor approval and a TABE Reading Score of eighth grade or higher
   or
   1. TABE Reading Score (eighth grade or higher)
   2. Instructor approval
   or
   3. Instructor approval

Applied Academic Credit

Content of the Introduction to Agriscience course has been aligned to the 2010 Mississippi Science Curriculum Framework. Students who successfully complete the Introduction to Agriscience curriculum will receive one Carnegie unit for science and an additional 0.5 Carnegie unit for completion of the Supervised Agricultural Experience (SAE).

Teacher Licensure

The latest teacher licensure information can be found at http://www.mde.k12.ms.us/educator-licensure.

Professional Learning

If you have specific questions about the content of any of training sessions provided, please contact the Research and Curriculum Unit at 662.325.2510 and ask for a professional-learning specialist.
# Course Outline

**Course Name:** Introduction to Agriscience  
**Course Code:** 029990

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<tr>
<td>1</td>
<td>Opportunities and Careers</td>
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</tr>
<tr>
<td>2</td>
<td>Lab Safety and the Scientific Method</td>
<td>10</td>
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<tr>
<td>3</td>
<td>Human Relations and FFA Activities</td>
<td>8</td>
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<td>4</td>
<td>Experiential Learning (SAE)</td>
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<td>5</td>
<td>Tools in Agriscience</td>
<td>12</td>
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<tr>
<td>6</td>
<td>Introduction to Biotechnology</td>
<td>10</td>
</tr>
<tr>
<td>7</td>
<td>Principles of Animal Science</td>
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<tr>
<td>8</td>
<td>Principles of Plant Science</td>
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<tr>
<td>9</td>
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<td>10</td>
<td>Principles of Environmental Resources</td>
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<tr>
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<tr>
<td>12</td>
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</table>
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Acknowledgments

The Introduction to Agriculture curriculum was presented to the Mississippi Board of Education on December 14, 2017. The following persons were serving on the state board at the time:

- Dr. Carey M. Wright, State Superintendent of Education
- Mrs. Rosemary G. Aultman, Chair
- Dr. Jason S. Dean, Vice-Chair
- Mr. Buddy Bailey
- Mrs. Kami Bumgarner
- Dr. Karen Elam
- Mr. Johnny Franklin
- Dr. John R. Kelly
- Mr. Charles McClelland

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Mike Mulvihill, Bureau Director of Career and Technical Education at the Mississippi Department of Education, provided insight regarding industry/education professionals and provided input throughout the developmental process and implementation of the curriculum framework and supporting materials.

Brad Skelton, Instructional Design Specialist for the Research and Curriculum Unit at Mississippi State University researched and authored this framework. 
Bradley.skelton@rcu.msstate.edu

Also, special thanks are extended to the teachers who contributed teaching and assessment materials that are included in the framework and supporting materials:

- Shelby Aulds, Houston Middle School, Houston, MS
- Jerry Clifton, Benton County Career and Technical Center, Ashland, MS
- Chess Jackson, Tylertown High School, Tylertown, MS
- Bob Robinson, Pelahatchie High School, Pelahatchie, MS
- Kramer Sowell, Brandon High School, Brandon, MS
- Billy Thacker, Water Valley High School, Water Valley, MS
- West Watkins, Nanih Waiya Attendance Center, Louisville, MS

Appreciation is expressed to the following professional, who provided guidance and insight throughout the development process:

- Lee James, Program Coordinator – Agriculture, Office of Career and Technical Education and Workforce Development, Mississippi Department of Education, Jackson, MS
Betsey Smith, Associate Director for the Research and Curriculum Unit at Mississippi State University

Scott Kolle, Project Manager for the Research and Curriculum Unit at Mississippi State University

Melissa Luckett, Project Coordinator for the Research and Curriculum Unit at Mississippi State University
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Executive Summary

Course Description

The Introduction to Agriscience course introduces students to the broad field of agriculture, biotechnology, and natural resources, including the production of plants and animals and the management of natural resources. The program includes instruction in the applied sciences related to plant and animal production and natural resource conservation and management, as well as introduces agribusiness-management practices and maintenance of facilities and equipment. Students in the course will participate in active learning exercises, including integral activities of the FFA organization and supervised experiences. Students who successfully complete the competencies in this course will possess fundamental knowledge and skills that can be used to secure entry-level employment or as a foundation for continuing their education. Industry standards are adapted from Career Cluster Resources for Agriculture, Food, and Natural Resources, a publication developed by the National Association of State Directors of Career and Technical Education.

Industry Certification

No national industry-recognized certifications for this course are known to exist at this time. However, competencies and suggested performance indicators in the Introduction to Agriscience course have been correlated to the National Agriculture, Food, and Natural Resources (AFNR) Career Cluster Content Standards that have been reviewed and endorsed at the national level by the National Council on Agricultural Education.

Student Prerequisites

In order for students to experience success in the Introduction to Agriscience course, the following prerequisites are in place:

1. C or higher in science (the previous year)
2. C or higher in English (the previous year)
3. C or higher in mathematics (last course taken or the instructor can specify)
4. Instructor approval

Applied Academic Credit

The latest academic credit information can be found at http://www.mde.k12.ms.us/ACCRED/AAS. Once there, click the “Mississippi Public School Accountability Standards Year” tab. Review the appendices for graduation options and superscript information regarding specific programs receiving academic credit. Check this site often as it is updated frequently.
Teacher Licensure

The latest teacher-licensure information can be found at http://www.mde.k12.ms.us/educator-licensure.

Professional Learning

If you have specific questions about the content of any of the training sessions provided, please contact the Research and Curriculum Unit at 662.325.2510, and ask for a professional-learning specialist.
# Course Outline

**Course Name** Introduction to Agriscience  **Course Code:** 029990

<table>
<thead>
<tr>
<th>Unit</th>
<th>Unit Name</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Opportunities and Careers</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>Lab Safety and the Scientific Method</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>Human Relations, Leadership, and FFA Activities</td>
<td>8</td>
</tr>
<tr>
<td>4</td>
<td>Experiential Learning (SAE)</td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td>Tools in Agriscience</td>
<td>12</td>
</tr>
<tr>
<td>6</td>
<td>Introduction to Biotechnology</td>
<td>10</td>
</tr>
<tr>
<td>7</td>
<td>Principles of Animal Science</td>
<td>13</td>
</tr>
<tr>
<td>8</td>
<td>Principles of Plant Science</td>
<td>13</td>
</tr>
<tr>
<td>9</td>
<td>Principles of Entomology</td>
<td>9</td>
</tr>
<tr>
<td>10</td>
<td>Principles of Environmental Resources</td>
<td>9</td>
</tr>
<tr>
<td>11</td>
<td>Mechanical Technologies in Agriscience</td>
<td>5</td>
</tr>
<tr>
<td>12</td>
<td>Alternative and Sustainable Energy in Agriscience</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>109</strong></td>
</tr>
</tbody>
</table>
2014 Teacher Academy

Mississippi Department of Education

Program CIP: 13.0101 Education, General

Direct inquiries to

Instructional Design Specialist Program Coordinator
Research and Curriculum Unit Office of Career and Technical Education
P.O. Drawer DX Office of Career and Technical Education
Mississippi Department of Education
Mississippi State, MS 39762 P.O. Box 771
662.325.2510 Jackson, MS 39205

Published by

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Jackson, MS 39205

Research and Curriculum Unit
Mississippi State University
Mississippi State, MS 39762

Betsey Smith, Curriculum Manager
Scott Kolle, Project Manager
Jolanda Harris, Educational Technologist

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The Teacher Academy curriculum was presented to the Mississippi Board of Education on March 20, 2014. The following persons were serving on the state board at the time:

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Dr. O. Wayne Gann, Chair
Mr. Howell “Hal” N. Gage, Vice Chair
Ms. Kami Bumgarner
Mr. William Harold Jones
Dr. John R. Kelly
Mr. Charles McClelland
Mr. Richard Morrison
Mrs. Rosemary G. Aultman
Mr. Simon F. Weir II

Jean Massey, Associate Superintendent of Education for the Office of Career and Technical Education at the Mississippi Department of Education, assembled a taskforce committee to provide input throughout the development of the Teacher Academy Curriculum Framework and Supporting Materials.

LeAnn G. Miller, Instructional Design Specialist for the Research and Curriculum Unit at Mississippi State University researched and authored this framework. leann.miller@rcu.msstate.edu

Also, special thanks are extended to the teachers who contributed teaching and assessment materials that are included in the framework and supporting materials:

Amy Baughman, Carl Lofton Vo-Tech Center, Marion County
Joan Easterling, Covington County Vocational Center, Covington County
Gena Heffner, Jackson County Vocational Center, Jackson County
Bethany Lucas, Philadelphia/Neshoba County CTC, Neshoba County
Robin McMichael, Wayne County Vocational Complex, Wayne County
Stephanie Peets, Madison Career & Technical Center, Madison
Jennifer Williams, Cleveland Career Development & Technology Center, Cleveland

Appreciation is expressed to the following professional, who provided guidance and insight throughout the development process:

Nicki Reeves, Program Coordinator—Education and Training, Office of Career and Technical Education and Workforce Development, Mississippi Department of Education, Jackson, MS
Preface

Secondary career and technical education programs in Mississippi face many challenges resulting from sweeping educational reforms at the national and state levels. Schools and teachers are increasingly being held accountable for providing true learning activities to every student in the classroom. This accountability is measured through increased requirements for mastery and attainment of competency as documented through both formative and summative assessments.

The courses in this document reflect the statutory requirements as found in Section 37-3-49, Mississippi Code of 1972, as amended (Section 37-3-46). In addition, this curriculum reflects guidelines imposed by federal and state mandates (Laws, 1988, Ch. 487, §14; Laws, 1991, Ch. 423, §1; Laws, 1992, Ch. 519, §4 eff. from and after July 1, 1992; Carl D. Perkins Vocational Education Act IV, 2007; and No Child Left Behind Act of 2001).
Executive Summary

Pathway Description

Teacher Academy is a pathway for students in the Education and Training career cluster. The Teacher Academy program is a high school program with courses designed to attract students to the field of education, to provide information and field experiences relevant to pursuing a degree in education, and to prepare students for the rigors of a career in education so they will remain long-term educators. The Teacher Academy pathway includes classroom and hands-on experiences that will prepare students for employment or continuing education in the education field.

Industry Certification

Industry standards in the Teacher Academy Curriculum Framework and Supporting Materials are based on the following:

National Board Professional Teaching Standards and the PRAXIS Standards

These standards advance the quality of teaching and learning by:

▪ Maintaining high and rigorous standards for what accomplished teachers should know and be able to do;

▪ Providing a national voluntary system certifying teachers who meet these standards; and

▪ Advocating related education reform to integrate National Board Certification in American education and to capitalize on the expertise of National Board Certified Teachers.
These standards are based on five proposition areas: teachers are committed to students and learning, teachers know the subjects they teach and how to teach those subjects to students, teachers are responsible for managing and monitoring student learning, teachers think systematically about their practice and learn from experience, and teachers are members of learning communities.

**Assessment**

The latest assessment blueprint for the curriculum can be found at

http://www.rcu.msstate.edu/Curriculum/CurriculumDownload.aspx

**Student Prerequisites**

In order for students to experience success in the program, the following student prerequisites are suggested:

1. C or higher in English (the previous year)
2. C or higher in Math (last course taken or the instructor can specify the math)
3. Instructor Approval and TABE Reading Score (eighth grade or higher)

or

1. TABE Reading Score (eighth grade or higher)
2. Instructor Approval

or

1. Instructor Approval

**Academic Credit**

The latest academic credit information can be found at

https://www.rcu.msstate.edu/MDE/PathwaysToSuccess.aspx. Once there, click the “Counselor
Resources” Tab, then click “Curriculum Enhancement List.” Check this site often as it is updated frequently.

Teacher Licensure

The latest teacher licensure information can be found at

http://www.mde.k12.ms.us/educator-licensure

Professional Learning

If you have specific questions about the content of any of training sessions provided, please contact the Research and Curriculum Unit at 662.325.2510.
Course Outlines

Option 1—Four One-Carnegie-Unit Courses

This curriculum consists of four one-credit courses, which should be completed in the following sequence:

1. Foundations of an Educator—Course Code: 996302
2. Practices of an Educator —Course Code: 996303
3. Exploring Diversity in Instruction—Course Code: 996304
4. Progressive Practices of Teacher Academy—Course Code: 996305

Course Description: Foundations of an Educator

The Foundations of an Educator course provides students with the opportunity to gain foundational skills needed to enhance them as learners, future educators, and communicators. Students receive history, theory, and professionalism needed to understand the educational system. Students should have the opportunity to observe skills learned in class at various educational settings (one Carnegie-unit).

Course Description: Practices of an Educator

The Practices of an Educator course provides students with the opportunity to gain knowledge and practice needed to enhance themselves as future educators. Students receive practice in
communication skills, planning, teaching, and assessment strategies needed to understand the educational system. Students should have the opportunity to observe and/or practice skills learned in class at various educational settings using school-to-career skills obtained in class (one Carnegie unit).

Course Description: Exploring Diversity in Instruction

The Exploring Diversity in Instruction course provides students with the opportunity to gain knowledge and understand advanced information that must be instilled in educators. Students receive information pertaining to advanced communication skills, diverse learners, and various subject areas needed to work in the educational system. Students should have the opportunity to observe and/or practice skills learned in class at various educational settings using school-to-career skills obtained in class (one Carnegie unit). Before students can enroll in the Exploring Diversity and Communication course, they must meet the following requirements:

1. Score 80% or higher on the MC-CPAS2 summative assessment

2. Attendance rate of 92% or better in the Foundations of an Educator (Course Code: 996302) and the Practices of an Educator (Course Code: 996303)

3. Successfully complete a grade, discipline, and work ethic review by the teacher

4. Present an updated portfolio during the review-by-teacher session

Course Description: Progressive Practices of Teacher Academy

The Progressive Practices of Teacher Academy course provides students with the opportunity to gain knowledge and understand progressive practices that must be instilled in educators. Students receive information pertaining to advanced planning instruction, teaching strategies,
assessments, and professional learning needed to work in the educational system. Students should have the opportunity to observe and/or practice skills learned in class at various educational settings (one Carnegie unit).

**Foundations of an Educator — Course Code: 996302**

<table>
<thead>
<tr>
<th>Unit Number</th>
<th>Unit Name</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Orientation and Safety</td>
<td>36</td>
</tr>
<tr>
<td>2</td>
<td>Teaching Career Opportunities</td>
<td>44</td>
</tr>
<tr>
<td>3</td>
<td>Human Growth and Development</td>
<td>60</td>
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<tr>
<td><strong>Total</strong></td>
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**Practices of an Educator — Course Code: 996303**

<table>
<thead>
<tr>
<th>Unit Number</th>
<th>Unit Name</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>History and Trends in American Education</td>
<td>24</td>
</tr>
<tr>
<td>5</td>
<td>Effective Teaching and Learning Environment</td>
<td>72</td>
</tr>
<tr>
<td>6</td>
<td>Appreciating Diverse Learners</td>
<td>42</td>
</tr>
<tr>
<td><strong>Total</strong></td>
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<td><strong>138</strong></td>
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**Exploring Diversity in Instruction — Course Code: 996304**

<table>
<thead>
<tr>
<th>Unit Number</th>
<th>Unit Name</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Instructional Strategies</td>
<td>65</td>
</tr>
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</table>
### Progressive Practices of Teacher Academy—Course Code: 996305

<table>
<thead>
<tr>
<th>Unit Number</th>
<th>Unit Name</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Instructional Planning</td>
<td>40</td>
</tr>
<tr>
<td>10</td>
<td>Field Experiences</td>
<td>75*</td>
</tr>
<tr>
<td>11</td>
<td>Professional Learning</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>135</td>
</tr>
</tbody>
</table>

*Hours may be distributed over a 2-year period.

### Option 2—Two Two-Carnegie-Unit Courses

This curriculum consists of two two-credit courses, which should be completed in the following sequence:

1. **Teacher Academy I—Course Code: 996300**

2. **Teacher Academy II—Course Code: 996301**

### Course Description: Teacher Academy I

Teacher Academy I is an entry-level course. Students gain foundation competencies related to students as learners, planning and assessing teaching, teaching strategies, and communication skills. Students receive hands-on field experiences (two Carnegie units).
**Course Description: Teacher Academy II**

Teacher Academy II provides students with the opportunity to gain advanced skills needed to enhance them as learners, teachers, and communicators. Students receive advanced hands-on field experiences (two Carnegie units).

**Teacher Academy I — Course Code: 996300**

<table>
<thead>
<tr>
<th>Unit Number</th>
<th>Unit Name</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>History and Trends in American Education</td>
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</tr>
<tr>
<td>5</td>
<td>Effective Teaching and Learning Environment</td>
<td>72</td>
</tr>
<tr>
<td>6</td>
<td>Appreciating Diverse Learners</td>
<td>42</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>278</strong></td>
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</table>

**Teacher Academy II — Course Code: 996301**

<table>
<thead>
<tr>
<th>Unit Number</th>
<th>Unit Name</th>
<th>Hours</th>
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<tbody>
<tr>
<td>7</td>
<td>Instructional Strategies</td>
<td>65</td>
</tr>
<tr>
<td>8</td>
<td>Assessment Strategies</td>
<td>75</td>
</tr>
<tr>
<td>9</td>
<td>Instructional Planning</td>
<td>40</td>
</tr>
<tr>
<td>10</td>
<td>Field Experiences</td>
<td>75*</td>
</tr>
<tr>
<td>----</td>
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<tr>
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<td>Professional Learning</td>
<td>20</td>
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<td>275</td>
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</tbody>
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Mandy E. Clark, Instructional Design Specialist for the Research and Curriculum Unit at Mississippi State University researched and authored this framework. mandy.clark@rcu.msstate.edu

Also, special thanks are extended to the teachers who contributed teaching and assessment materials that are included in the framework and supporting materials:

- Gina Freeland, Ocean Springs High School CTE, Jackson County
- Dr. Deidra Gammill, Petal High School, Forrest County
- Gena Heffner, Jackson County Vocational Center, Jackson County
- Lee Mason, Lamar County Center for Technical Education, Lamar County
- Angela Roberts, Prentiss County Vocational Complex, Prentiss County
- Leisa Shumaker, Ross Collins Vocational Center, Lauderdale County
- Regina Thorton, Career Development Center, Jackson
- Joy Trehern, Kosciusko Attala County Vocational Complex, Attala County
- Rebecca Whittet, Gulfport High School, Harrison County
- Jennifer Williams, Cleveland Career Development & Technology Center, Bolivar County

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Janie Leech, Program Coordinator – Education and Training, Office of Career and Technical Education and Workforce Development, Mississippi Department of Education, Jackson, MS

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Assessment

The latest assessment blueprint for the curriculum can be found at http://www.rcu.msstate.edu/Curriculum/CurriculumDownload.aspx.

Student Prerequisites

In order for students to experience success in the program, the following student prerequisites are suggested:

1. C or higher in English (the previous year)
2. C or higher in mathematics (last course taken or the instructor can specify)
3. Instructor approval and TABE reading score (eighth grade or higher)
4. No more than two discipline referrals (the previous year)
5. 90% attendance rate (the previous year)
or

1. TABE reading score (eighth grade or higher)
2. Instructor approval

or

1. Instructor approval

**Academic Credit**

The latest academic credit information can be found at [http://www.mde.k12.ms.us/ACCRED/AAS](http://www.mde.k12.ms.us/ACCRED/AAS).
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3. Exploring Diversity in Instruction – Course Code: 996304
4. Progressive Practices of Teacher Academy – Course Code: 996305

Course Description: Foundations of an Educator

Foundations of an Educator provides students with the opportunity to gain foundational skills needed to enhance them as learners, future educators, and communicators. Students receive history, theory, and professionalism needed to understand the educational system. Students should have the opportunity to observe skills learned in class at various educational settings (one Carnegie unit).

Course Description: Practices of an Educator

Practices of an Educator provides students with the opportunity to gain knowledge and practice needed to enhance themselves as future educators. Students receive practice in communication skills, planning, teaching, and assessment strategies needed to understand the educational system. Students should have the opportunity to observe and/or practice skills learned in class at various educational settings using school-to-career skills obtained in class (one Carnegie unit).

Course Description: Exploring Diversity in Instruction

Exploring Diversity in Instruction provides students with the opportunity to gain knowledge and understand advanced information that must be instilled in educators. Students receive information pertaining to advanced communication skills, diverse learners, and various subject areas needed to work in the educational system. Students should have the opportunity to observe and/or practice skills learned in class at various educational settings using school-to-career skills obtained in class (one Carnegie unit). Before students can enroll in Exploring Diversity and Communication, they must meet the following requirements:

1. Score 80% or higher on the MS-CPAS summative assessment
2. Attendance rate of 92% or better in Foundations of an Educator (Course Code: 996302) and Practices of an Educator (Course Code: 996303)
3. Successfully complete a grade, discipline, and work ethic review by the teacher
4. Present an updated portfolio during the review-by-teacher session
Course Description: Progressive Practices of Teacher Academy
Progressive Practices of Teacher Academy provides students with the opportunity to gain knowledge and understand progressive practices that must be instilled in educators. Students receive information pertaining to advanced planning instruction, teaching strategies, assessment, and professional learning needed to work in the educational system. Students should have the opportunity to observe and/or practice skills learned in class at various educational settings (one Carnegie unit).

Foundations of an Educator—Course Code: 996302

<table>
<thead>
<tr>
<th>Unit</th>
<th>Unit Name</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Orientation and Safety</td>
<td>30</td>
</tr>
<tr>
<td>2</td>
<td>Becoming an Effective Teacher</td>
<td>35</td>
</tr>
<tr>
<td>3</td>
<td>Human Growth and Development</td>
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<td>Total</td>
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</table>

Practices of an Educator—Course Code: 996303

<table>
<thead>
<tr>
<th>Unit</th>
<th>Unit Name</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>History and Trends in American Education</td>
<td>30</td>
</tr>
<tr>
<td>5</td>
<td>Classroom Management</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>Cumulative Clinical Hours*</td>
<td>25</td>
</tr>
<tr>
<td>Total</td>
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</tbody>
</table>

*Hours may be distributed over first year.

Exploring Diversity in Instruction—Course Code: 996304

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<th>Unit Name</th>
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<tbody>
<tr>
<td>6</td>
<td>Orientation and Safety</td>
<td>20</td>
</tr>
<tr>
<td>7</td>
<td>Appreciating Diverse Learners</td>
<td>45</td>
</tr>
<tr>
<td>8</td>
<td>Instructional Planning and Strategies</td>
<td>45</td>
</tr>
<tr>
<td>Total</td>
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Progressive Practices of Teacher Academy—Course Code: 996305

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<thead>
<tr>
<th>Unit</th>
<th>Unit Name</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Assessment Strategies</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Cumulative Clinical Hours**</td>
<td>50</td>
</tr>
<tr>
<td>Total</td>
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<td>90</td>
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</table>

**Hours may be distributed over second year.
Option 2—Two Two-Carnegie Unit Courses

This curriculum consists of two two-credit courses, which should be completed in the following sequence:

1. Teacher Academy I—Course Code: 996300
2. Teacher Academy II—Course Code: 996301

Course Description: Teacher Academy I

Teacher Academy I is an entry-level course. Students gain foundational competencies related to students as learners, planning and assessing teaching, teaching strategies, and communication skills. Students receive hands-on field experiences (two Carnegie units).

Course Description: Teacher Academy II

Teacher Academy II provides students with the opportunity to gain advanced skills needed to enhance them as learners, teachers, and communicators. Students receive advanced hands-on field experiences (two Carnegie units).

Teacher Academy I—Course Code: 996300

<table>
<thead>
<tr>
<th>Unit</th>
<th>Unit Name</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Orientation and Safety</td>
<td>30</td>
</tr>
<tr>
<td>2</td>
<td>Becoming an Effective Teacher</td>
<td>35</td>
</tr>
<tr>
<td>3</td>
<td>Human Growth and Development</td>
<td>45</td>
</tr>
<tr>
<td>4</td>
<td>History and Trends in American Education</td>
<td>30</td>
</tr>
<tr>
<td>5</td>
<td>Classroom Management</td>
<td>45</td>
</tr>
<tr>
<td></td>
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<td>*Hours may be distributed over first year.</td>
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Teacher Academy II—Course Code: 996301

<table>
<thead>
<tr>
<th>Unit</th>
<th>Unit Name</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Orientation and Safety</td>
<td>20</td>
</tr>
<tr>
<td>7</td>
<td>Appreciating Diverse Learners</td>
<td>45</td>
</tr>
<tr>
<td>8</td>
<td>Instructional Planning and Strategies</td>
<td>45</td>
</tr>
<tr>
<td>9</td>
<td>Assessment Strategies</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Cumulative Clinical Hours**</td>
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</tr>
<tr>
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</tr>
<tr>
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