OFFICE OF CHIEF ACADEMIC OFFICER
Summary of State Board of Education Agenda Items
January 18, 2018

OFFICE OF CAREER AND TECHNICAL EDUCATION

04.   Action: Begin the Administrative Procedures Act process: To revise selected Mississippi Secondary Curriculum Frameworks in Career and Technical Education [Goal 2 – MBE Strategic Plan]

Executive Summary

The Mississippi Secondary Curriculum Frameworks have a four-year curricula revision cycle. The revision cycle includes input from local district personnel and business/industry partners. Approved secondary curricula will be disseminated for implementation in the 2018-2019 school year.

The following secondary curriculum frameworks are recommended for approval:

1.   Agricultural and Natural Resources
2.   Digital Media Technology
3.   Engineering Core
4.   Engineering II
5.   Introduction to Agriscience
6.   Teacher Academy

All curricula frameworks are designed to provide local programs with an instructional foundation that can be used to develop localized instructional management plans and course syllabi. Additionally, the frameworks include the following elements for each revised secondary curriculum:

- Program
- Description
- Classification of Instructional Program (CIP) Code and CIP Name
- Course Outline and Codes

  ➢   Curriculum
  ➢   Student Competencies
  ➢   Suggested Student Objectives

NOTE: The Office of Career and Technical Education has provided summaries of the curriculum framework revisions and an Executive Summary of each framework.

This item references Goal 2 of the *Mississippi Board of Education 2016-2020 Strategic Plan*.

Recommendation: Approval

Back-up material attached

Summary of Secondary Curricula Changes for Career & Technical Education for 2018

Agriculture and Natural Resources

- Aligned curriculum with 2018 Mississippi College and Career Ready Standards (MS CCRS) for Science
- Revised Unit 2 Leadership and Human Rights to Agricultural Leadership and Career Development
- Developed an Ag Small Engine Unit (Unit 8)
- Decreased Year 1 hours from 210 to 200 and Year 2 hours increased from 210 to 220
- Outlined more specific content to be covered and assessed within each unit

Digital Media Technology

- Revised Competencies and Objectives in Units 1, 4, and 5
- Changed from Unit 6 content was Media Rich Content Design to Preparing Portfolios
- Renamed Unit 8 to Preparing to Edit Video Production
- Combined Units 9, 10, and 11

Engineering Core

- Added Student Organization section to introductory unit
- Moved Ethics and Safety sections to Unit 2
- Aligned with National Assessment of Educational Progress' Technology and Engineering Literacy Framework, National Society of Professional Engineers Code of Ethics, NASA BEST Engineering Design Process, OSHA 10-hour General Industry Guidelines, Institute of Electrical and Electronics Engineers Symbols, Materials Safety Data Sheet (MSDS), and Lockout/Tagout
- Combined Careers section into one unit to include Engineering Technology (ET)
- Combined Technical Writing section with history and technology
- Revised objectives to reflect similar language of the National Research Council's Framework for K-12 Science Education
- Added specificity to objectives in terms of content
- Added optional enrichment competencies to some objectives

Engineering II

- Added Safety Review component to beginning of course
- Aligned with National Assessment of Educational Progress' Technology and Engineering Literacy Framework, National Society of Professional Engineers Code of Ethics, NASA BEST Engineering Design Process, OSHA 10-hour General Industry Guidelines, Institute of Electrical and Electronics Engineers Symbols, Materials Safety Data Sheet (MSDS), and Lockout/Tagout
- Added detailed CAD section leading to option of 3D drafting certification
- Integrated Mechanical Unit into Robotics and Manufacturing Systems

- Revised objectives to reflect similar language of the National Research Council's Framework for K-12 Science Education
- Added specificity to objectives in terms of content
- Added optional enrichment competencies to some objectives
- Added Capstone Unit with optional Maker Movement enrichment elements

Introduction to Agriscience

- Aligned curriculum with 2018 Mississippi College and Career Ready Standards (MS CCRS) for Science
- Revised objectives to reflect similar language of the National Research Council's Framework for K-12 Science Education
- Added specificity to objectives in terms of content
- Developed Unit 5 Tools in Agriculture
- Moved Unit 5 Mechanical Technologies in Agriscience to Unit 12
- Adjusted unit hours between units, total hours remain 109

Teacher Academy

- Aligned units for improved sequence of content
- Aligned to academic content standards
- Aligned to content for possible Dual Credit/Dual Enrollment opportunities
- Added content to address special populations of students (Special Education students, struggling students, etc.)
- Incorporated Code of Ethics into curriculum content

The back-up for Tab 04 is a large document so it is on the Career and Technical Education (CTE) web page for you to review if you would like. Below is the link to the CTE back-up materials.

"January 2018 CTE Board Items" hyperlink is: http://www.mdek12.org/octe

CTE Backup for January 2018 Board Items

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Executive Summary for Agricultural and Natural Resources

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.

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 *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.

Assessment

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

Executive Summary for Digital Media Technology

Pathway Description

This program is designed for students who wish to develop, design, and implement projects in the fast-growing field of digital media. The program emphasizes the techniques and tools used in digital media and the creative design or content of such media. Both theoretical learning and activity-based learning are provided for students who wish to develop and enhance their competencies and skills. The course focuses on the basic areas of computer graphics, audio-production multimedia, and animation. Exposure to state-of-the-art equipment is given through advice by experts from industry.

Industry Certification

Research with Mississippi industry suggests that this curriculum should be aligned to the Adobe Certified Associate Certification or an equivalent. This exam assesses the foundation of digital communication skills students need to create effective communication using digital media tools. This certification was developed after a group of industries met with educators to design the entry-level skill industry standards for internet communication, rich-media communication, and visual communication. Additionally, the Final Cut Pro (latest edition) is recognized as the standard industry software for video production. It is recommended that this curriculum be aligned the Final Cut Pro Level 1 Certification or an equivalent.

Assessment

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

Executive Summary for Engineering Core

Pathway Description

Engineering Core 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 two-year or four-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
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Executive Summary for Engineering II

Pathway Description

Engineering II 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.

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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:

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Assessment
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Executive Summary for Introduction to Agriscience

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.

Executive Summary for Teacher Academy

Pathway Description

Teacher Academy is a pathway for students in the Education and Training Career Cluster. Teacher Academy is a high school program with courses designed to attract students to the field of education, provide information and field experiences relevant to pursuing a degree in education, and 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 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
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