Gordon A. Cain Center

CATALOG FOR THE GORDON A. CAIN CENTER PROGRAM OFFERINGS

The Gordon A. Cain Center for STEM Literacy supports high-quality STEM education and college readiness initiatives through programs and services that build capacity for successful teaching and student learning. Through the programs offered exclusively by the Cain Center, teachers have the opportunity to participate in a variety of college and career ready STEM professional development (PD) programs. While all opportunities require teachers to attend professional development, each opportunity serves different students and has different benefits, costs, eligibility requirements, and school- and district-level commitment. To better understand each offering, we have put together this catalog which helps identify course codes (where relevant), industry based credential potential, Dual enrollment opportunities, and crossover between our courses and the TOPS University/TOPS Tech (Jumpstart) domain.

To learn more about our programs, please check out our program guide by clicking on the link or scanning the qr code.

Cain Center Program Guide.pdf

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LSU

Gordon A. Cain Center

LSU STEM PATHWAY COURSE CATALOG

Course Title	Code	Course Title	Code
Advanced Film & TV Production (LSU Partnership)	080024	Interactive Computing (LSU Partnership)	061180
Advanced Robotics (LSU Partnership)	150730	Interactive Digital Media Capstone (LSU Partnership)	040245
Basic Film & TV Production (LSU Partnership)	080023	Introduction to Biomedical Sciences (LSU Partnership)	090811
Pilot: Bioinformatics (LSU Partnership)	090813	Introduction to Computational Thinking (LSU Partnership)	061140
Biomedical Capstone (LSU Partnership)	090812	Introduction to Engineering Design (LSU Partnership)	110801
Coding for the Web (LSU Partnership)	040244	Introduction to Robotics (LSU Partnership)	150780
Comparative Anatomy & Physiology (LSU Partnership)	312095	Introduction to STEM Pathways and Careers (LSU Partnership)*	061139
Conservation Biology (LSU Partnership)	312094	Louisiana Wetlands Ecology	312090
Cybersecurity (LSU Partnership)	040217	Motion Graphics	080816
Data Manipulation and Analysis (LSU Partnership)	080532	Principles of Engineering (LSU Partnership)	110864
Digital Image (LSU Partnership)	080021	Programming for Digital Media (LSU Partnership)	040243
Digital Storytelling (LSU Partnership)	040241	Programming for STEM/Engineering (LSU Partnership)	144300
Engineering Design & Development (LSU Partnership)	110861	Sound Design (LSU Partnership)	080020
Engineering Economy (LSU Partnership)	144200	Survey of Computer Science*	061179
Forensic Science (LSU Partnership)	312096	Video Game Design (LSU Partnership)	080022

*High school course available in middle school (for high school credit)

Pilot courses that are not yet BESE Approved STEM Pathway courses

Course Title	Code	Course Title	Code
Pilot: Aquaponics Design	TBD	Pilot: Introduction to esports	TBD
Pilot: Cybersecurity II	TBD	Pilot: Survey of Drones	TBD

Advanced Film & TV Production (PILOT)

HS Code: 080024	**Dual Enrollment:** No
Suggested Grade Level: 10th or above	I**ndustry Based Credentials:** Novac Digital Media Portfolio (A)* *Requires multiple courses to earn
Tops University Credit: Elective	**Jumpstart K-16 STEM Pathways:** Digital Design & Emergent Media; **Jumpstart 2.0 Pathways:** Arts, AV Tech & Communication
Description:	This course expands upon the filming and production skills developed in the Basic course. Students will do in-depth projects in various film and television styles (narrative film, video journalism, documentary, broadcast, etc.) and will develop their skills in videography, editing, and production skills to develop a portfolio of video work.
Student Prerequisite: Basic Film and TV required	**Teacher Prerequisite:** Basic Film & TV Production training and/or prior videography/video production experience

Advanced Robotics	
HS Code: 150730	**Dual Enrollment:** No
Suggested Grade Level: 11th or 12th	I**ndustry Based Credentials:** None
Tops University Credit: Elective	**Jumpstart K-16 STEM Pathways:** Pre-Engineering **Jumpstart 2.0 Pathways:** N/A
Description:	This course will bring students into the world of competitive robotics. After completing Introduction to Robotics, students who are interested in joining a competition robotics team can join the advanced robotics course. The curriculum will expose students to advanced building and programming techniques suitable for competition. Students are required to attend at least one weekend competition as part of the course.
Student Prerequisite: Introduction to Robotics preferred	**Teacher Prerequisite:** Introduction to Robotics preferred

Aquaponics Design (High School, PILOT)	
HS Code: TBD, not BESE approved yet	**Dual Enrollment:** No
Suggested Grade Level: 9th or above	I**ndustry Based Credentials:** BASF Plant Science
Tops University Credit: Elective	**Jumpstart K-16 STEM Pathways:** N/A until BESE approval **Jumpstart 2.0 Pathways:** None
Description:	This course serves as an introduction to aquaponics and aquaponic design at the high school level. Students will use problem-based learning to explore how to raise fish and grow various plants in a single system. They will learn about system design and how to engineer system solutions. Students will develop fish and plant management techniques as they learn about water chemistry and plant/ fish needs. They will also gather and utilize data as they research the best parameters for plant/ fish growth and harvest. Students will then harvest the plants and fish and develop a marketing plan for their harvest as they learn food safety skills.
Student Prerequisite: None	**Teacher Prerequisite:** None

Basic Film & TV Production

HS Code: 080023	**Dual Enrollment:** No
Suggested Grade Level: 10th or above	I**ndustry Based Credentials:** Adobe Certified Professional - Premiere Pro (B)**, Novac Digital Media Portfolio (A)* *Requires multiple courses to earn **Can be combined with Adobe Photoshop to create (A) credential
Tops University Credit: Elective	**Jumpstart K-16 STEM Pathways:** Digital Design & Emergent Media **Jumpstart 2.0 Pathways:** Arts, AV Tech & Communication
Description:	This course serves as an introduction to the filming and production skills required to create audiovisual media in the realm of film and television. Students will learn the differences between various film and television styles (narrative film, video journalism, documentary, broadcast, etc.) and will learn proper videography, editing, and production skills through hands-on projects.
Student Prerequisite: None	**Teacher Prerequisite:** Prior videography/video production experience is beneficial.

Bioinformatics (PILOT)	
HS Code: 090813	**Dual Enrollment:** No
Suggested Grade Level: 11th or 12th	I**ndustry Based Credentials:** None
Tops University Credit: Elective	**Jumpstart K-16 STEM Pathways:** Pre-Healthcare and Pre-Veterinary **Jumpstart 2.0 Pathways:** Human Service
Description:	This course introduces bioinformatics to high school students, emphasizing searching and retrieving biological data, sorting the data, and finally analyzing the sorted data to draw meaningful conclusions. This course involves hands-on activities and projects on computers/laptops and teaches students how to relate the outcome of each activity to a real-life biological scenario. While moving through this course, students are introduced to cutting-edge bioinformatics resources and tools so that by the end of the course they are prepared to either pursue advanced college-level computational biological studies, or apply the knowledge gained in this course to tackle common bioinformatic tasks at a university-level biology research lab.
Student Prerequisite: None	**Teacher Prerequisite:** None

Biomedical Capstone	
HS Code: 090812	**Dual Enrollment:** No
Suggested Grade Level: 12th	I**ndustry Based Credentials:** None
Tops University Credit: Elective	**Jumpstart K-16 STEM Pathways:** Pre-Healthcare and Pre-Veterinary **Jumpstart 2.0 Pathways:** Health Sciences
Description:	This course is for seniors in the Biomedical Academy. Students spend time interning for a wide range of biomedically focused local companies, businesses, and organizations. Students in this course will gain work experience and become more familiar with several possible career paths and opportunities available to them so that they can make informed decisions on how to best achieve their biomedical professional goals. It is recommended that students have access to their own transportation.

Student Prerequisite: Introduction to Biomedical Science, Comparative Anatomy and Physiology	**Teacher Prerequisite:** None

Coding for the Web	
HS Code: 040244	**Dual Enrollment:** No
Suggested Grade Level: 10th or above	**Industry Based Credentials:** CIW JavaScript Specialist (B), CIW Advanced HTML5 and CSS3 Specialist (B), Novac Digital Media Portfolio (A)* *Requires multiple courses to earn
Tops University Credit: Elective	**Jumpstart K-16 STEM Pathways:** Digital Design & Emergent Media **Jumpstart 2.0 Pathways:** Arts, AV Tech & Comm; Business Management; Information Technology
Description:	Coding for the web is an introductory course focusing on the foundational programming concepts in web development, such as: functions, loops, conditional statements, async functions, lambdas, as well as analyzing and solving problems like a programmer. Though this course uses HTML5, CSS3, JSS, and ES6, this is not a "web design" course. Students will have the skills, knowledge, and experience to create web applets by the end of the course. The main goal of this course is to develop students that have the ability to think critically about how to solve problems using computational thinking and good old-fashioned troubleshooting.
Student Prerequisite: None	**Teacher Prerequisite:** None

Comparative Anatomy & Physiology	
HS Code: 312095	**Dual Enrollment:** No
Suggested Grade Level: 9th or 10th	**Industry Based Credentials:** None
Tops University Credit: Elective	**Jumpstart K-16 STEM Pathways:** Pre-Healthcare and Pre-Veterinary **Jumpstart 2.0 Pathways:** Agriculture, Food & Natural Resources; Health Sciences
Description:	This course engages students in rigorous study of the body's physiological systems and then compares these systems across many species in the animal kingdom (both vertebrates and invertebrates). Course assignments range from formal assessments to hands-on dissections and labs. Additionally, this course places an emphasis on public speaking through scientific presentations and independent research to enhance scientific reading and writing skills. Students will also learn to read and interpret published scientific articles to examine evolutionary relationships between species, making connections that will be built on in later bioinformatics studies.
Student Prerequisite: None	**Teacher Prerequisite:**

Conservation Biology (LSU Partnership)	
HS Code: 312094	**Dual Enrollment:** No

Suggested Grade Level: 9th or 10th	**Industry Based Credentials:** None
Tops University Credit: Elective	**Jumpstart K-16 STEM Pathways:** Environmental Protection & Sustainability **Jumpstart 2.0 Pathways:** Health Sciences
Description:	This course provides an introduction to the economic, social, and environmental aspects of sustainability, including the knowledge and skills needed to provide solutions to combat environmental issues such as coastal erosion and decarbonization, and prepare the workforce needed to implement those solutions. Students will explore the interconnectedness between human infrastructures and natural systems (including the impacts on the environment like the burning of fossil fuels and runoff from fertilizers), ecology, resource availability and use, and economic and human impacts. Lastly, students will examine systems in place to promote sustainability and determine their impacts on the ecosystem. This class will use inquiry and project-based lessons and will include an introduction to field and laboratory techniques.
Student Prerequisite: None	**Teacher Prerequisite:** None

Cybersecurity I	
HS Code: 040217	**Dual Enrollment:** No
Suggested Grade Level: 9th or above	**Industry Based Credentials:** CompTIA IT Fundamentals (B)
Tops University Credit: Elective	**Jumpstart K-16 STEM Pathways:** Computing and Cybersecurity **Jumpstart 2.0 Pathways:** Universal Safety Course
Description:	This course is designed to foster interest in Information Technology and networking careers. Students taking this course will develop the knowledge and skills required to identify and explain the basics of computing, IT infrastructure, applications, software development, database use, and security concepts. This will prepare students taking this course to take the CompTIA Tech+ (formerly ITF+) certification exam.
Student Prerequisite: None	**Teacher Prerequisite:** None

Cybersecurity II (PILOT)		
HS Code: TBD	**Dual Enrollment:** CSC 1011 (LSU E)	**Cr. Hr:** 3
Suggested Grade Level: 11th or above	**Industry Based Credentials:** TBD	
Tops University Credit: Elective	**Jumpstart K-16 STEM Pathways:** TBD **Jumpstart 2.0 Pathways:** TBD	
Description:	Description will be forthcoming.	
Student Prerequisite: Cybersecurity I and BOR and LSU DE eligibility criteria for DE	**Teacher Prerequisite:** Cybersecurity I	

Data Manipulation and Analysis	
HS Code: 080532	**Dual Enrollment:** No

Suggested Grade Level: 10th or above	**Industry Based Credentials:** CIW Data Analyst (B)
Tops University Credit: Elective	**Jumpstart K-16 STEM Pathways:** Pre-Healthcare and Pre-Veterinary; Computing and Cybersecurity; Digital Design & Emergent Media; Pre-Engineering; Cyber.org Cybersecurity **Jumpstart 2.0 Pathways:** Business Management; Health Sciences; Information Tech; Manufacturing; Transportation, Distribution & Logistics
Description:	This course introduces students to the field of data analysis, an area that is increasingly important in our data-driven society. The course covers essential practices for effective data manipulation, analysis, and interpretation, with an interdisciplinary approach that encompasses mathematics, statistics, and computing. The primary focus of this course is on the practical application of concepts, rather than theoretical aspects. Students will learn about the nature of data, how to analyze it, and its significance in various societal contexts. They will gain an understanding of the processes involved in creating, organizing, and analyzing diverse forms of data. A key component of the course is hands-on experience with RStudio, a powerful tool for data analysis. Students will learn to use RStudio to manipulate and interpret data, developing skills that are directly applicable in real-world scenarios. One of the objectives of this course is to prepare students for the CIW Data Analyst certification exam, which they can take at the end of the school year. The curriculum closely follows the CIW guidelines and includes numerous practical applications to reinforce the concepts covered in the exam.
Student Prerequisite: basic programming course preferred	**Teacher Prerequisite:** basic programming experience preferred

Digital Image		
HS Code: 080021	**Dual Enrollment:** ART2050 (LSU A&M)	**Cr. Hr:** 3
Suggested Grade Level: 10th or above	**Industry Based Credentials:** Adobe Certified Professional - Photoshop (B)*, Novac Digital Media Portfolio (A)** *Can be combined with Adobe Premiere Pro to create (A) credential **Requires multiple courses to earn	
Tops University Credit: Art	**Jumpstart K-16 STEM Pathways:** Digital Design & Emergent Media **Jumpstart 2.0 Pathways:** Universal Computer Literacy Course	
Description:	This course is based on hands-on training in the use of computer hardware and software to create digital graphics with Photoshop and Illustrator. As the student develops familiarity with these industry standard programs and graphic tools, 2D animation and design projects will be overseen by mentors. The 2D animation partition of the class focuses on rigging, planar tracking, rotoscoping and motion tracking in order to develop seamless continuity of character animation and dynamic set development.	
Student Prerequisite: BOR and LSU DE eligibility criteria apply	**Teacher Prerequisite:** None	

Digital Storytelling	
HS Code: 040241	**Dual Enrollment:** No

Suggested Grade Level: 9th	**Industry Based Credentials:** Novac Digital Media Portfolio (A)* *Requires multiple courses to earn
Tops University Credit: Art	**Jumpstart K-16 STEM Pathways:** Digital Design & Emergent Media; **Jumpstart 2.0 Pathways:** Arts, AV Tech & Communication; Business Management; Hospitality and Tourism; Human Service; Information Technology
Description:	This is a project-based learning (PBL) inspired course that utilizes a PBL assessment guide in addition to thoughtful integrated learning. Throughout the course, experimentation, and the practice of storytelling through the lenses of multiple mediums allows students to develop narrative reasoning skills, while simultaneously giving them a realm to be creative and challenged. The course was created in response to the demand from "entertainment" industries for individuals skilled in content creation and transfer of thinking. The purpose of this course is to get our students to become creators rather than just consumers. The course focuses on content creation, specifically in the realms of: Visual, Auditory, Videographic, and Interactive Storytelling. The course also focuses on Digital Literacy, and how to become a responsible denizen. At any point throughout the course, students use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills.
Student Prerequisite: None	**Teacher Prerequisite:** None

Engineering Design and Development		
HS Code: 110861	**Dual Enrollment:** No	
Suggested Grade Level: 10th or above	**Industry Based Credentials:** Autodesk Inventor (A)	
Tops University Credit: Art	**Jumpstart K-16 STEM Pathways:** Pre-Engineering **Jumpstart 2.0 Pathways:** Architecture and Construction; Manufacturing	
Description:	The primary intent of this course is to provide students with the skills necessary to understand, interpret, and create engineering drawings and working sketches. Students will learn to develop 3D models and engineering drawings using Autodesk Inventor while also exploring the intersection of engineering and technical art. Through projects that emphasize visual communication, students will apply artistic principles such as multiviews, isometrics, and precision to enhance the clarity and impact of their technical designs. In addition to building spatial reasoning and technical drawing skills, students will strengthen their technical writing abilities, soft skills, and oral presentations throughout the year. The course will culminate in a 6–8 week capstone project where student teams will identify a problem, design a unique solution using Inventor, create a prototype with a 3D printer, and test the solution—integrating both engineering precision and technical artistry into their final designs.	
Student Prerequisite: Preferred concurrent enrollment in Geometry or completion of Geometry	**Teacher Prerequisite:** None	

Engineering Economy		
HS Code: 144200	**Dual Enrollment:** IE3201 (LSU A&M)	**Cr. Hr:** 3
Suggestqqq ed Grade Level: 11th or 12th	**Industry Based Credentials:** None	

Tops University Credit: Elective	**Jumpstart K-16 STEM Pathways:** Pre-Engineering **Jumpstart 2.0 Pathways:** None
Description:	The Engineering Economy course is designed to teach students about the time value of money, cash flows occurring at different times with different amounts, and equivalence at different interest rates. These concepts will be used to evaluate engineering project proposals using well-accepted economic analysis techniques, such as present worth, future worth, capitalized cost, life-cycle costing, annual worth, rate of return, or benefit/cost analysis. Additionally, techniques such as replacement/retention studies, breakeven analysis, and payback analysis help make informed decisions about future uses of existing assets and systems.
Student Prerequisite: BOR and LSU DE eligibility criteria apply	**Teacher Prerequisite:** None

Forensic Science	
HS Code: 312096	**Dual Enrollment:** No
Suggested Grade Level: 10th or 11th	**Industry Based Credentials:** N/A
Tops University Credit: Elective	**Jumpstart K-16 STEM Pathways:** Biomedical **Jumpstart 2.0 Pathways:** Human Services; Law & Public Safety
Description:	This lab-intensive course allows students to pursue an in-depth study of forensic science as a tool for collecting evidence and crime scene analysis. Areas of study include physical evidence, properties of matter and the analysis of glass, drugs, forensic toxicology, the microscope, forensic serology, DNA, trace evidence, fire investigation, investigation of explosives, fingerprints, ballistics, forensic anthropology, casts and impressions, document examination and computer forensics.
Student Prerequisite:	**Teacher Prerequisite:**

Interactive Computing	
HS Code: 061180	**Dual Enrollment:** No
Suggested Grade Level: 10th or above	**Industry Based Credentials:** No
Tops University Credit: Elective	**Jumpstart K-16 STEM Pathways:** Computing and Cybersecurity **Jumpstart 2.0 Pathways:** Arts, AV Tech & Communication; Information Technology
Description:	This course focuses on the nuances of programming for interacting with the real world in two representative areas: autonomous robots and the front end of web applications. Students learn how to iteratively approximate a software model to the realities of the physical hardware, how to write test suites and how to systematically debug their programs. Through fun and engaging projects, the students learn problem solving skills, such as programming robots to navigate mazes and play soccer, developing on-line pages to read sensors and control actuators in greenhouses, and automating devices at home with Internet of Things (IoT) technologies.
Student Prerequisite: a prior programming course	**Teacher Prerequisite:** prior programming experience

Interactive Digital Media Capstone	
HS Code: 040245	**Dual Enrollment:** No
Suggested Grade Level: 11th or above	**Industry Based Credentials:** Novac Digital Media Portfolio (A)* *Requires multiple courses to earn
Tops University Credit: Elective	**Jumpstart K-16 STEM Pathways:** Digital Design and Emergent Media **Jumpstart 2.0 Pathways:** Arts, AV Tech & Communication
Description:	Interaction design & experience design incorporating digital media assets with programming to create interactive experiences. This is an advanced projects course to synthesize media and digital storytelling from other production courses into emergent media projects. Capstone Projects are faculty facilitated, student led teams creating a digital media artifact from conception to presentation. Example works might include a 2D or 3D video game; a student-developed social network web application; a movie or animation; interactive informational kiosk for a museum or library; a concert of student-created digital media performances.
Student Prerequisite:	**Teacher Prerequisite:** Prior experience in media production is required, experience with coding is beneficial.

Introduction to Biomedical Sciences	
HS Code: 090811	**Dual Enrollment:** No
Suggested Grade Level: 9th	**Industry Based Credentials:** None
Tops University Credit: Elective	**Jumpstart K-16 STEM Pathways:** Pre-Healthcare and Pre-Veterinary **Jumpstart 2.0 Pathways:** Agriculture, Food & Natural Resources; Health Science
Description:	This modular course covers a large variety of fields in biomedicine. Each module is designed to take two to three weeks and provide students with opportunities to develop their public speaking and science literacy skills, as well as learn how to cooperate in a group efficiently and professionally. Topics include but are not limited to sports medicine, pharmacology, psychology, nutrition, veterinary medicine, bioinstrumentation, biomedical engineering, forensic anthropology, parasitology, and speech pathology. Modules can be selected based on student interest, availability of potential guest speakers, or timing of field trips.
Student Prerequisite: None	**Teacher Prerequisite:** None

Introduction to Computational Thinking	
HS Code: 061140	**Dual Enrollment:** No
Suggested Grade Level: 9th	**Industry Based Credentials:** Python (B)
Tops University Credit: Elective	**Jumpstart K-16 STEM Pathways:** Pre-Healthcare and Pre-Veterinary; Computing and Cybersecurity; Digital Design & Emergent Media; Pre-Engineering **Jumpstart 2.0 Pathways:** All except Health Sciences
Description:	This course introduces students to the basic ideas of computational thinking and its applications

	to problem solving in STEM fields. Students will use a Python IDE, through which they learn how to use abstraction, decomposition and pattern recognition to model problems and arrive at an algorithmic solution. Program code is presented with a dual purpose: as the main way to interact with a computer and as a proxy to organize ideas explicitly and communicate them to other people. Students taking Algebra I concurrently with this course will benefit the most, because many examples are drawn from Algebra I, so that students can visualize and manipulate the mathematical concepts in a more concrete form. This course is designed to help students achieve a CTE accreditation in Python.
Student Prerequisite: None	**Teacher Prerequisite:** None

Introduction to Engineering		
HS Code: 110801	**Choice Credit DE:** ENGR1050 (LSU A&M)	**Cr. Hr:** 2
Suggested Grade Level: 9th	**Industry Based Credentials:** None	
Tops University Credit: Elective	**Jumpstart K-16 STEM Pathways:** Pre-Engineering **Jumpstart 2.0 Pathways:** Agriculture, Food & Natural Resources; Architecture and Construction; Manufacturing	
Description:	This course introduces the profession, ethics, and diversity of the field of engineering to students in their freshman year of high school. The course will allow students to explore the 10 primary concentrations within engineering by listening to guest speaker lectures, working on an interactive project with a team, and presenting the results of their project to the class. The majors are: Biological Engineering, Civil Engineering, Environmental Engineering, Chemical Engineering, Computer Engineering/ Electrical Engineering, Computer Science, Construction Management, Industrial Engineering, Mechanical Engineering, and Petroleum Engineering. Specifically, this course will emphasize that the engineer is a team worker who needs strong skills in technical problem solving, engineering design, ethical decision making, and communicating to diverse audiences.	
Student Prerequisite: For DE Only: 2.5 High School GPA and Counselor Recommendation Form	**Teacher Prerequisite:** None	

Introduction to esports (Pilot)	
HS Code: TBD, not yet BESE approved	**Dual Enrollment:** No
Suggested Grade Level: 9th	**Industry Based Credentials:** None
Tops University Credit: Elective	**Jumpstart K-16 STEM Pathways:** Digital Design and Emergent Media (Coming 2024/25) **Jumpstart 2.0 Pathways:** TBD
Description:	A holistic overview of esports and an introduction of the professional esports industry. Students will learn both the business and practice of running a successful esports team.
Student Prerequisite: None	**Teacher Prerequisite:** None

Introduction to Robotics

HS Code: 150780	**Dual Enrollment:** No
Suggested Grade Level: 10th	**Industry Based Credentials:** None
Tops University Credit: Elective	**Jumpstart K-16 STEM Pathways:** Pre-Engineering; Computing and Cybersecurity **Jumpstart 2.0 Pathways:** Information Technology; Manufacturing
Description:	This beginning robotics course uses VEX EDR Robotics parts and VEXCode software to introduce the student to basic programming as well as problem solving strategies. This course will involve students in the development, building and programming of robots to accomplish various tasks. Students will work hands-on in teams to design, build, program and document their progress. Topics may include motor speed, gear ratios, torque, sensors, program loops, project documentation and decision-making.
Student Prerequisite: None	**Teacher Prerequisite:** None

Introduction to STEM Pathways and Careers	
HS Code: 061139	**Dual Enrollment:** No
Suggested Grade Level: 7th, 8th, or 9th	**Industry Based Credentials:** CIW Internet Business Associate
Tops University Credit: None	**Jumpstart K-16 STEM Pathways:** Biomedical Science, Computing and Cybersecurity, Digital Design and Emergent Media, Pre-Engineering; Cyber.org Cybersecurity **Jumpstart 2.0 Pathways:** Universal Basic Career Readiness
Description:	The course explores four main pathways of STEM education and possible careers in the fields of 1) Computing and Computer Science, 2) Pre-Engineering, 3) Digital Design and Emergent Media, and 4) Biomedical Sciences. The course exposes students to these overarching concepts: ● To expand awareness of various careers and occupational pathways related to STEM. ● To stimulate the understanding of higher order thinking processes such as the engineering design process, the scientific method, and computational thinking. ● To develop foundational knowledge and skills in the Jumpstart K-16 STEM Pathways, Jumpstart 2.0 Pathways, and careers as related to STEM, and utilize the knowledge and skills in their current educational setting. ● To increase interest in the four core areas of STEM related to this class through project-based activities that are also standards based. ● To prepare students to take the CIW Internet Business Associate Certification
Student Prerequisite: None	**Teacher Prerequisite:** None

Louisiana Wetlands Ecology (PILOT)		
HS Code: 312090	**Choice Credit DE:** RNR 2062 (LSU A&M)	**Cr Hr:** 3
Suggested Grade Level: 9th or above	**Industry Based Credentials:** Ducks Unlimited Ecology Conservation and Management Certification (B)	
Tops University Credit: Elective	**Jumpstart K-16 STEM Pathways:** Environmental Protection and Sustainability **Jumpstart 2.0 Pathways:** Agriculture, Food, and Natural Resources	

Description:	This course will examine the physical and biological processes that created Louisiana's unique landscape. The composition, formation, and stabilization of the atmosphere and ecosystem will be examined, with an emphasis on coastal areas and the wetlands. The course will also focus on the concepts that tie living organisms to their environment, including the function of ecosystems, communities, and populations. Lastly, students will explore the current management practices occurring in Louisiana and how humans are impacting the environment.This class will utilize inquiry and project-based lessons throughout the curriculum and will include an introduction to field and laboratory techniques. A capstone project is included in wetland engineering.

Student Prerequisite: Student must meet one of the three options for BOR student eligibility if taken for DE	**Teacher Prerequisite:** None

Motion Graphics		
HS Code: 080016	**Dual Enrollment:** ART2220 (LSU A&M)	**Cr. Hr:** 3
Suggested Grade Level: 10th or above	I**ndustry Based Credentials:** Novac Digital Media Portfolio (A)* *Requires multiple courses to earn	
Tops University Credit: Elective	**Jumpstart K-16 STEM Pathways:** Digital Design and Emergent Media **Jumpstart 2.0 Pathways:** N/A	

Description:	This course is based on hands-on training in the use of computer hardware and software to create digital graphics with Photoshop and Illustrator. As the student develops familiarity with these industry standard programs and graphic tools, 2D animation and design projects will be overseen by mentors. The 2D animation partition of the class focuses on rigging, planar tracking, rotoscoping and motion tracking in order to develop seamless continuity of character animation and dynamic set development.

Student Prerequisite: Digital Image For DE: 1. Min grade of "C-" in ART 2050 2. 2.5 High School GPA 3. Counselor Recommendation Form	**Teacher Prerequisite:** Training in Digital Image

Principles of Engineering	
HS Code: 110864	**Dual Enrollment:** No
Suggested Grade Level: 10th	I**ndustry Based Credentials:** None
Tops University Credit: Physical Science	**Jumpstart K-16 STEM Pathways:** Pre-Engineering **Jumpstart 2.0 Pathways:** Agriculture, Food & Natural Resources; Architecture and Construction; Information Technology; Manufacturing

Description:	The course continues to build on the Introduction to Engineering course. Students will spend approximately 3 weeks exploring each discipline through concept lectures and hands-on projects. Through these lectures and projects students will learn concepts such as, but not limited to, electrical circuitry, computer programming on Arduino's, Rube Goldberg machines, biomechanics, and pneumatics/hydraulic systems. Students will work in teams to develop problem-solving skills and apply their knowledge of research and design to create solutions to

	various challenges. Students will also hone their 21st century skills by documenting their work and communicating their solutions to their peers and members of the professional community.
Student Prerequisite: Introduction to Engineering	**Teacher Prerequisite:** Introduction to Engineering Preferred

Programming for Digital Media		
HS Code: 040243	**Dual Enrollment:** CSC 2700 (LSU A&M)	**Cr. Hr:** 3
Suggested Grade Level: 10th or above	**Industry Based Credentials:** CIW JavaScript Specialist (B), Novac Digital Media Portfolio (A)* *Requires multiple courses to earn	
Tops University Credit: Elective	**Jumpstart K-16 STEM Pathways:** Digital Design and Emergent Media **Jumpstart 2.0 Pathways:** Arts, AV Tech & Communication; Information Technology	
Description:	Programming Digital Media introduces a broad array of topics related to digital media through project-oriented programming of graphics, audio, and hardware applications. The motivation for this course is to provide a basic introduction to computer programming using subjects that are relevant or appealing to students who are new to technological fields of study, with little to no prior programming experience. The course is presented in five segments, introducing coding, covering three distinct areas in digital media, plus a final integration project of these areas. There is a strong emphasis on computer programming tasks throughout, and the hands-on exercise of digital media tools in class is required. After an introduction to coding concepts, the first media topic introduces real-time graphics rendering and user interaction. The second introduces sound design. The third introduces basic electronics and physical computing. Finally, communication mechanisms are used allowing the disparate elements of graphics, sound, and hardware to be composed into interactive projects.	
Student Prerequisite: Digital Image, BOR and LSU DE eligibility criteria apply	**Teacher Prerequisite:** None	

Programming for STEM	
HS Code: 144300	**Dual Enrollment:** No
Suggested Grade Level: 11th - 12th	**Industry Based Credentials:** No
Tops University Credit: Elective	**Jumpstart K-16 STEM Pathways:** Computing and Cybersecurity, Pre-Engineering **Jumpstart 2.0 Pathways:** Information Technology
Description:	This course expands the practice of software development in a variety of settings, so that students acquire a broad set of programming skills and a deeper understanding of software engineering principles. Students learn to plan, design, and implement relatively large programming projects that require background research and teamwork. Topics include simulations, games, and interactive on-line applications. Robust program design and sound software engineering practices are emphasized throughout the course.
Student Prerequisite: a prior programming course	**Teacher Prerequisite:** prior programming experience, preferably Intro to Computational Thinking (LSU Partnership) AND one of the following: Data Manipulation & Analysis or

	Interactive Computing

Sound Design		
HS Code: 080020	**Dual Enrollment:** MUS 2745 (LSU A&M)	**Cr. Hr:** 3
Suggested Grade Level: 10th or above	**Industry Based Credentials:** Avid Pro-Tools (B)*, Novac Digital Media Portfolio (A)** *LSU course uses Presonus Studio-One software (local company) - currently no IBC. Some strong teachers could teach the course using Pro-tools by Avid which has a basic credential **Requires multiple courses to earn	
Tops University Credit: Art	**Jumpstart K-16 STEM Pathways:** Digital Design and Emergent Media **Jumpstart 2.0 Pathways:** Arts, AV Tech & Communication	
Description:	Sound Design introduces students to a broad range of topics and concepts in electronic and computer music. This course covers principles of digital audio, sound design, synthesis, Digital Audio Workstations, and sound art composition. Assignments and activities include listening, analysis, discussion, and hands-on recording and composition exercises.	
Student Prerequisite: BOR and LSU DE eligibility criteria apply	**Teacher Prerequisite:**	

Survey of Computer Science		
HS Code: 061179	**Dual Enrollment:** No	
Suggested Grade Level: 8th or 9th	**Industry Based Credentials:** No	
Tops University Credit: Elective	**Jumpstart K-16 STEM Pathways:** Computing and Cybersecurity **Jumpstart 2.0 Pathways:** Information Technology; Law & Public Safety	
Description:	This course introduces the basics of computing using fun and engaging activities instead of formally describing the concepts. This course follows the framework of Big Ideas adopted in the AP Computer Science Principles (CSP) course, but it has more emphasis on exploration and experimentation, and less emphasis on problem-solving and formal analysis than a regular CSP course. To prepare students for the rigors of other courses in the Pathways, this course models ways to adopt a productive disposition that fosters creativity and perseverance, with a focus on developing students' interest in computing and identification with the computing professions. This course can be taken in middle school for high school credit	
Student Prerequisite: None	**Teacher Prerequisite:** None	

Survey of Drones (Pilot)	
HS Code: TBA not yet BESE approved, use 110796 for now	**Dual Enrollment:** No
Suggested Grade Level: 11th or 12th	**Industry Based Credentials:** FAA Part 107: Small Unmanned Aircraft Operation (B)

Tops University Credit: Elective	**Jumpstart K-16 STEM Pathways:** Pre-Engineering (coming 24-25) **Jumpstart 2.0 Pathways:** TBD
Description:	The Survey of Drones course is designed to provide aspiring drone pilots with the knowledge and skills necessary to obtain their FAA Remote Pilot Certificate under Part 107 regulations. While there are no prerequisites to this course, it is designed for students who are at least high school juniors or who have already taken and passed one pre-engineering course. This comprehensive course covers the essential topics and concepts required to operate drones for commercial purposes. Students will learn about Federal airspace regulations, flight safety, weather conditions, emergency procedures, aerodynamic principles, and aviation human factors. Through a combination of classroom instruction and hands-on flight training, participants will gain a deep understanding of the rules and responsibilities of being a certified remote pilot. Students will work hands-on in crews to plan and execute sUAS flight missions related to real world business applications. Topics may include sUAS performance, airport operations, radio communication, etc. Students have the opportunity to work as a project manager, remote pilot in command, visual observer, and person manipulating the controls. This is a project-based course and will be presented via lectures, discussions, and group projects. By the end of the course, students will be well-prepared to pass the FAA Part 107 knowledge exam and confidently navigate the ever-expanding field of commercial drone operations.Specifically, this course will emphasize that the drone pilot or data collection technician is a team worker who needs strong skills in technical problem solving, engineering design, aeronautical decision making, and communicating to diverse audiences.
Student Prerequisite: Must be 16 years old and have a government issued photo ID to take the FAA Pilot License	**Teacher Prerequisite:** None

Video Game Design (Pilot)	
HS Code: 080022	**Dual Enrollment:** No
Suggested Grade Level: 10th or 11th	I**ndustry Based Credentials:** Novac Digital Media Portfolio (A)* *Requires multiple courses to earn
Tops University Credit: Elective	**Jumpstart K-16 STEM Pathways:** Digital Design & Emergent Media; **Jumpstart 2.0 Pathways:** Arts, AV Tech & Communication
Description:	This is a project-based learning (PBL) inspired course that utilizes a PBL assessment guide in addition to thoughtful integrated learning. Video game design requires knowledge and skill in a variety of component areas of study: coding, sound design, storytelling, 2D and 3D graphics, photography, film, game engines. By the end of the course, students will produce a substantial video game experience using the game engine available through the school (the curriculum is geared toward Godot). The purpose of this course is to encourage students to become creators rather than just consumers.
Student Prerequisite: Previous experience in 1 or more LSU DDEM STEM Pathway courses is preferred.	**Teacher Prerequisite:** Previous experience in 1 or more LSU DDEM STEM Pathway courses is preferred.

Gordon A. Cain Center

MIDDLE SCHOOL STEM ELECTIVE COURSE CATALOG

Course Name	Course Code
Introduction to Aquaponics (**middle school**)	Generic
Step into Computer Science (**middle school**)	Generic
Step Into STEM (**middle school**)	Generic

Introduction to Aquaponics (Middle School)	
HS Code: N/A, Use generic MS elective code	**Dual Enrollment:** N/A
Suggested Grade Level: 6th, 7th	**Industry Based Credentials:** N/A
Tops University Credit: N/A	**Jumpstart K-16 STEM Pathways:** N/A **Jumpstart 2.0 Pathways:** N/A
Description:	Students will use problem-based learning to explore raising fish and growing plants in the same system then market and sell the product locally. Students will learn the basics of water chemistry and plant/ fish biology, data management, nutrition, food safety and research and development in the process.
Student Prerequisite: None	**Teacher Prerequisite:** None

Step Into Computer Science 1 (Pilot)	
HS Code: N/A, Use generic MS elective code	**Dual Enrollment:** N/A
Suggested Grade Level: 6th	**Industry Based Credentials:** N/A
Tops University Credit: N/A	**Jumpstart K-16 STEM Pathways:** N/A **Jumpstart 2.0 Pathways:** N/A
Description:	This year-long exploratory middle school course equips students with the foundational knowledge of computational thinking and computer science as specified in the Louisiana CS Standards. Through interactive activities and projects, students will delve into the exciting world of computer science, where they will create animations, games, art, and stories, while also fostering creativity and computational thinking/ problem-solving skills in the process. Throughout the course, participants will gain a solid understanding of the basics of computer science and block-based programming, laying the groundwork for more advanced studies. Emphasis will be placed on applying computational thinking to real-life situations, allowing students to see the practical applications of the concepts they learn.
Student Prerequisite: None	**Teacher Prerequisite:** None

Step Into STEM	
HS Code: N/A, Use generic MS elective code	**Dual Enrollment:** N/A
Suggested Grade Level: 6th	**Industry Based Credentials:** N/A
Tops University Credit: N/A	**Jumpstart K-16 STEM Pathways:** N/A

	Jumpstart 2.0 Pathways: N/A
Description:	Students will use project and problem-based learning to solve challenges related to the 4 main STEM Pathways of Engineering, Biomedical Science, Digital Design, and Computing. As students meet these challenges, they will learn more about various STEM careers as well as learn some of the same skills used in those careers to solve problems. Student solutions are shared with others in the school and local community. Project examples include creating a computer game, designing an outdoor school environment to meet the needs of the school and ecosystem, designing a solution to a flood related problem in the community, and telling a digital story about a cause they are involved with.
Student Prerequisite: None	**Teacher Prerequisite:** None

Gordon A. Cain Center

COLLEGE CREDIT OPPORTUNITY COURSE CATALOG

Course Name	Course Code
Pre-Dual Enrollment	
English III	120333
Algebra II	160322
Dual Enrollment: Choice Credit Modality	See Below
Dual Enrollment: Facilitator Model	See below

Pre DE: English III	
HS Code: 120333	**Dual Enrollment:** No
Suggested Grade Level: 11th	**Industry Based Credentials:** None
Tops University Credit: English	**Jumpstart K-16 STEM Pathways:** N/A **Jumpstart 2.0 Pathways:** N/A
Description:	The goal of the English III pre-dual enrollment program is to prepare students for success in future English DE courses as well as on-campus college English courses. The English III course will: ● scaffold skills for mastery of college readiness requirements ● incorporate standardized test preparation and state benchmark standards ● allow teachers to make specific content choices ● collect reflective feedback and student data for quarterly review of program material
Student Prerequisite: None	**Teacher Prerequisite:** None

Pre DE: Algebra II	
HS Code: 160322	**Dual Enrollment:** No
Suggested Grade Level: 9th, 10th, 11th	**Industry Based Credentials:** None
Tops University Credit: Elective	**Jumpstart K-16 STEM Pathways:** None **Jumpstart 2.0 Pathways:** None
Description:	The course runs in MyMathLab and includes supplemental activities independent of MyMathLab for use in the classroom. This course is completely aligned with the Louisiana Mathematical Standards. A list of topics includes: ● Systems of Equations ● Exponents, Polynomials, and Polynomial Functions ● Rational Expressions ● Rational Exponents, Radicals, and Complex Numbers ● Quadratic and Higher Degree Equations and Functions ● Exponential and Logarithmic Functions ● Sequences and Series ● Trigonometric Functions and Identities ● Statistics
Student Prerequisite: None	**Teacher Prerequisite:** None

Dual Enrollment: Choice Credit Modality

LSU's Dual Enrollment: Choice Credit-Modality offers all high-school learners affordable access to college-level courses in an entirely no-risk environment. This opportunity fosters academic self-confidence while providing an introductory exposure to the high demands and challenges of undergraduate curriculum. To learn more about the course offerings, please see our course catalog: 2025-2026 Dual Enrollment Choice Credit Model Course Catalog

Dual Enrollment: Facilitator Model

LSU's Dual Enrollment Program is an integral part of the LSU College Readiness Program, which is administered through the Gordon A. Cain Center on LSU's campus. Dual enrollment (DE) offers high school students the opportunity to take official LSU courses in their high school classroom and earn both LSU and high school credit at the same time. LSU offers more than 35 courses in fifteen disciplines for dual enrollment credit in our Facilitator Model. To learn more about the course offerings, please see our course catalog: 2025-2026 Dual Enrollment Facilitator Model Course Catalog

PROFESSIONAL DEVELOPMENT THROUGH NATIONAL PARTNERSHIPS

Training Name	Course Code
Code.org - AP CSA (11th-12th)	061175
Code.org - CS Principles (9th-12th)	061177
Code.org - CS Discoveries (6th-10th)	N/A
Code.org - CS Fundamentals (K-5th)	N/A
CASE Principles of Agricultural Science- Plant Science	010474

Code.org - AP CSA	
HS Code: 061175	**Dual Enrollment:** No
Suggested Grade Level: 11th or 12th	**Industry Based Credentials:** None
Tops University Credit: Math	**Jumpstart K-16 STEM Pathways:** Biomedical Science; Computing and Cybersecurity; Cybersecurity; Digital Design and Emergent Media; Pre-Engineering **Jumpstart 2.0 Pathways:** Arts, AV Tech & Communication; Information Technology
Description:	AP® Computer Science A invites students to learn programming using Java and can be taken after completing an introductory course such as Computer Science Principles or Computer Science Discoveries.
Student Prerequisite: Computer Science Principles, Computer Science Discoveries, and/or a similar introductory computer science course	**Teacher Prerequisite:** Able to independently write and debug an error-free function (or procedure) with one or more parameters and that uses conditional logic, loops, and an array (or a list)

Code.org - CS Principles	
HS Code: 061177	**Dual Enrollment:** No
Suggested Grade Level: 9th-12th	**Industry Based Credentials:** None
Tops University Credit: Elective	**Jumpstart K-16 STEM Pathways:** Biomedical Science; Computing and Cybersecurity; Cybersecurity; Digital Design and Emergent Media; Pre-Engineering **Jumpstart 2.0 Pathways:** Arts, AV Tech & Communication; Information Technology
Description:	Computer Science Principles covers many topics including the Internet, Big Data and Privacy, and Programming and Algorithms. The curriculum is flexible to be taught as an AP or non-AP course.
Student Prerequisite: None	**Teacher Prerequisite:** None

Code.org - CS Discoveries	
HS Code: N/A	**Dual Enrollment:** N/A
Suggested Grade Level: 6th-10th	**Industry Based Credentials:** N/A
Tops University Credit: N/A	**Jumpstart K-16 STEM Pathways:** N/A **Jumpstart 2.0 Pathways:** N/A
Description:	Computer Science Discoveries is an introductory course that empowers students to engage with computer science as a medium for creativity, communication, problem solving, and fun! The training allows teachers to implement the 50-150 hours worth of content in either a semester or a full year.
Student Prerequisite: None	**Teacher Prerequisite:** None

Code.org - CS Fundamentals	
HS Code: N/A	**Dual Enrollment:** N/A
Suggested Grade Level: K-5	**Industry Based Credentials:** N/A
Tops University Credit: N/A	**Jumpstart K-16 STEM Pathways:** N/A **Jumpstart 2.0 Pathways:** N/A
Description:	Designed to be fun and engaging, Code.org's progression of Computer Science Fundamentals courses blend online and "unplugged" activities to teach students computational thinking, problem solving, programming concepts and digital citizenship.
Student Prerequisite: None	**Teacher Prerequisite:** None

CASE Principles of Agricultural Science- Plant Science	
HS Code: 010474	**Dual Enrollment:** N/A
Suggested Grade Level: 11th and 12th	**Industry Based Credentials:** N/A
Tops University Credit: N/A	**Jumpstart K-16 STEM Pathways:** Environmental Protection and Sustainability, Pre-Healthcare and Pre-Veterinary **Jumpstart 2.0 Pathways:** Agriculture, Food, and Natural Resources
Description:	The Case Institute is a professional development event preparing teachers to implement the full year CASE Course "Principles of Agricultural Science – Plant (ASP)". This course provides a foundation of plant science knowledge and skills. Students will experience various plant science concepts through exciting "hands-on" activities, projects, and problems. Student experiences will include the study of plant anatomy and physiology, classification, and the fundamentals of production and harvesting. Students will learn how to apply scientific knowledge and skills to use plants effectively for agronomic, forestry, and horticultural industries. Students will discover the value of plant production and its impact on the individual, the local, and the global economy. Students will work on major projects and problems similar to those that plant science specialists, such as horticulturalists, agronomists, greenhouse and nursery managers, and plant research specialists, face in their respective careers. Students will understand specific connections between the course's lesson and Supervised Agricultural Experience and FFA components of agricultural education programs. Students will improve investigative, experimental, and communication skills.

Student Prerequisite: None	**Teacher Prerequisite:** None

PROFESSIONAL DEVELOPMENT FOR MIDDLE AND ELEMENTARY MODULES

Elementary School STEM Modules (PreK-5th)
Elementary School Computer Science Ignite 2.0 (PreK-5th)
Middle School STEM Modules (6th-8th)

Elementary School STEM Training Modules	
HS Code: N/A	**Dual Enrollment:** N/A
Suggested Grade Level: Pre-K to 5th	**Industry Based Credentials:** N/A
Tops University Credit: N/A	**Jumpstart K-16 STEM Pathways:** N/A **Jumpstart 2.0 Pathways:** N/A
Description:	The elementary cohort's purpose is to empower teachers with the tools and training they need to effectively engage all students in STEM driven, project-based learning while also meeting their curricular needs. Teachers are trained in project-based STEM modules that are aligned to curricular standards in core content areas or computer science/ digital literacy in the PK-5 levels. The modules can be used in class as stand-alone units, incorporated into current curriculum, or used in before/ after school programs. Modules encourage exploration of and preparation for students to enter the STEM Pathways beginning at the middle school levels and beyond. A list of modules available for the training sessions is linked. Teachers at the Pk-1, 2-3, and 4-5 grade bands will be trained in at least 8 of the available modules for each grade band.
Student Prerequisite: None	**Teacher Prerequisite:** None

Elementary Computer Science Professional Development Workshop Computer Science Adventures: Engaging Young Minds through CS and Technology	
HS Code: N/A	**Dual Enrollment:** N/A
Suggested Grade Level: Pre-K to 5th	**Industry Based Credentials:** N/A
Tops University Credit: N/A	**Jumpstart K-16 STEM Pathways:** N/A **Jumpstart 2.0 Pathways:** N/A
Description:	This 40-hour professional development workshop is designed to enhance PK-5 elementary educators' understanding of computer science fundamentals through project-based learning and skill development. By building this foundational knowledge, educators will be better equipped to foster students' appreciation of how core computer science concepts can be applied to everyday life. The training will be conducted synchronously at Louisiana State University, where participants will explore a range of open-source platforms and learn how to integrate them across various content areas. The workshop will focus on developing computational thinking skills, block coding, physical computing, cybersecurity, and emerging technologies.
Student Prerequisite: None	**Teacher Prerequisite:** None

Middle School STEM Training Modules	
HS Code: N/A	**Dual Enrollment:** N/A
Suggested Grade Level: 6th to 8th	**Industry Based Credentials:** N/A
Tops University Credit: N/A	**Jumpstart K-16 STEM Pathways:** N/A **Jumpstart 2.0 Pathways:** N/A
Description:	The middle school STEM modules training will provide teachers with the tools and training they need to effectively engage all students in STEM driven, project-based learning while also meeting their curricular needs. Teachers are trained in project-based STEM modules that are aligned to curricular standards in core content areas or computer science/ digital literacy in the 6-8 levels. The modules can be used in class as stand-alone units, incorporated into current curriculum, or used in before/ after school programs. Modules encourage exploration of and preparation for students to enter the STEM Pathways beginning at the middle school levels and beyond.
Student Prerequisite: None	**Teacher Prerequisite:** None