Program Proposal

Unmanned Systems Technology

Hazard Community and Technical College

June 13-14, 2019
Hazard Community and Technical College
Institution Submitting Proposal

Associate of Applied Science
Degree Designation as on Diploma

Unmanned Systems Technology
Title of Proposed Degree Program

Certificate
Drone Operator Specialist

Certificate
First Responder Specialist

Certificate
GIS/Unmanned Systems Specialist

Certificate
Remote Drone Pilot

Intended Date of Implementation

September 1, 2019
## Kentucky Community and Technical College System

### Proposal for Initiation of a New Degree/Diploma Program

<table>
<thead>
<tr>
<th>Credential to be Awarded</th>
<th>Program Name</th>
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<tr>
<td>Associate in Applied Science</td>
<td>Unmanned Systems Technology</td>
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<tr>
<th>Track(s): (if applicable)</th>
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<tr>
<th>College</th>
<th>Proposed Starting Date</th>
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<table>
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<tr>
<th>CIP Code</th>
<th>CIP Taxonomy Title</th>
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<tr>
<td>47.0609</td>
<td>Avionics Maintenance Technology/Technician</td>
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**Signature:**

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**Date:**

5-20-19

College President/CEO
EXECUTIVE SUMMARY
Associate of Applied Science in Unmanned Systems Technology
Hazard Community and Technical College
A Proposal for Initiation of a New Degree Program

A. Centrality to the Institution’s Mission and Consistency with State’s Goals

The proposed Associate of Applied Science (AAS) in Unmanned Systems Technology (UST) is consistent with the mission of Hazard Community and Technical College. This program will provide access to high quality career and technical education that will prepare workers to have the skills necessary to compete and succeed in the manufacturing sector. The program also provides HCTC with the opportunity to respond to emerging workforce needs in the community to support and promote economic vitality in the region.

The UST program also addresses statewide and national needs, both within the Kentucky Community and Technical College System (KCTCS) and the Council on Postsecondary Education (CPE). Specifically to KCTCS, the program will increase student access to a post-secondary credential, create a clear pathway for students to reach employment outcomes and thus quality of life through jobs, which earn a good living.

The UST program will respond to CPE’s statewide goals by addressing strategies 2, 7, 8 and 9. The program will provide a pathway for high school students to earn dual credit and improve college readiness in the area, provide students with a career oriented program, ensure academic quality and provide the region with economic growth.

B. Program Quality and Student Success

The student outcomes for the UST program include both general education and technical education competencies. The general education competencies focus on critical thinking, teamwork, problem solving and communication skills, to name a few. This combination of competencies provides students with the skills and knowledge based to be successful in the manufacturing industry.

The technical competencies for the UST program focus on courses that require students to understand and apply knowledge to the entire unmanned systems process including mission planning, pre/post flight inspection, operation, fabrication, troubleshooting, and crew management in a variety of fields.

C. Program Demand/Unnecessary Duplication

The current estimated employment in Kentucky in for positions related to unmanned systems such as technicians, aerospace, and robotics is 226 openings. Where UST is a new and emerging field, there is no data on actual employment or salary. Indeed.com shows 795 direct unmanned systems positions, such as Drone Operator, Drone Videographer, Site Technician, UAS Test Operator, Flight Services Pilot, Agriculture Services Pilot, Solar Site Technician, Graphics Programmer, Drone Training Program Manager, UAS Specialist, Machine Control Specialist, Service Technician, at $35,000 or above (of these 349 positions are $50,000 or above) across the nation. Job types includes full-time, part-time, contract, commission, internship, and temporary.
Additional discussion with local government and economic development groups indicate active pursuance of operators of unmanned systems, specifically drones, and providing technician services to build and repair unmanned systems. Various businesses/employers in the service area has contacted HCTC including utility companies, surveyors, law enforcement agencies, and first responders, about the need for trained workers. Three businesses have already started in Perry County with direct relation to unmanned systems technology and as they grow, there will be need for additional employment.

Potential students demand for the program includes individuals who need to be retrained from coal mining or other occupations and high school students. Surveys in the school districts indicated strong student demand for the UST program.

D. Cost and Funding of the Proposed Program

The program will utilize existing faculty who have been certified in areas of unmanned systems. Additional part-time faculty have been identified for specific areas such as GIS and emergency management. This program will be offered at the Hazard campus with mostly online options. An existing classroom at the Hazard Campus has already been setup to house the unmanned systems program due to workforce needs. The classroom already contains computers, table desks, and houses many of the drone and other equipment to be used. The equipment required for hands on training has already been purchased through college and workforce funding. A request for an additional drone has been requested for 2019-2020 with Perkins funding. No additional general education faculty will be needed. No full-time faculty are needed at this time. Sustainability of the program will be provided through revenue from tuition.

E. Program Review and Assessment

Review of the UST program and assessment of student learning outcomes will utilize processes already established at HCTC for all technical program. Annually, each program participates in a program review process, focused on qualitative and quantitative data to set goals for the program for the year.
Table of Contents

EXECUTIVE SUMMARY ................................................................. i

Evaluation Criteria
A. Centrality to the Institution’s Mission and Consistency with State’s Goals . 1
B. Program Quality and Student Success ........................................ 4
C. Program Demand/Unnecessary Duplication ................................. 15
D. Cost and Funding of the Proposed Program ............................... 20
E. Program Review and Assessment .............................................. 22
Appendix A ................................................................. 24
Appendix B ................................................................. 28
Appendix C ................................................................. 37
Appendix D ................................................................. 39
Evaluation Criteria

A. Centrality to the Institution’s Mission and Consistency with State’s Goals

1. List the objectives of the proposed program. These objectives should deal with the specific institutional and societal needs that this program will address.

The objectives of the HCTC AAS in Unmanned Systems Technology (UST) program are to:

- Provide a rigorous high quality curriculum that produces graduates with the skills, knowledge and abilities required for unmanned systems and related jobs.
- Provide graduates who will meet the needs of local and regional employers and spark entrepreneurial unmanned systems activities in the region.
- Provide a career pathway into unmanned systems careers, including aviation, engineering, and related pathways, to 4-year programs for high school graduates.
- Provide incumbent workers with skills and credentials to advance their careers.

2. Explain how the proposed program relates to the institutional mission and strategic plan.

The AAS in Unmanned Systems Technology aligns with the missions of Hazard Community and Technical College (HCTC) and the Kentucky Community and Technical College System (KCTCS) by improving the employability and quality of life of Kentucky citizens as the primary provider of College and Workforce Readiness, Transfer Education and Workforce Education and Training.

The expansion of academic programming to include the Associate of Applied Science in Unmanned Systems Technology is consistent with the mission as it prepares students to gain employment in high wage technical fields. The proposed new program will also provide an opportunity for incumbent workers to acquire new knowledge and skills for advancement along with a clear pathway to a STEM career for high school students.

Specific strategic priorities of the college that align with the proposed new program include:

- HCTC will raise the level of educational attainment in the region by positioning HCTC as the accessible, affordable and relevant postsecondary education choice.
- HCTC will develop clear pathways through all levels of postsecondary education with an emphasis on experiential learning that leads to successful employment outcomes for HCTC graduates.
- HCTC will align programs and curricula with needs of employers that enhance the employability, job placement and career development of HCTC graduates.

3. Explain how the proposed program addresses the state’s postsecondary education strategic agenda.

(The address all that apply.)

The Kentucky Council on Postsecondary Education’s (CPE) strategic agenda for 2016-2021 Stronger By Degrees recognizes the value of a well-educated and highly educated workforce. The goal is to raise the percentage of Kentuckians with a high-quality postsecondary degree or certificate to 60 percent by the year 2030. The three priorities are 1) Opportunity: encourage more people to
take advantages of postsecondary opportunities; 2) Success: increase degree and certificate completion, fill workforce shortages and guide more graduates to a career path, and 3) Impact: create economic growth and development and make our state more prosperous. All of the priorities apply directly to the Unmanned Systems Technology Proposal.

Our region has opportunity for economic development in the unmanned systems area with a highly trained workforce. Offering the AAS along with the credentials will allow HCTC to create economic growth by guiding graduates to paths with high wage careers. This program will prepare students, beginning in high school with dual credit opportunities in a pathway into unmanned systems, engineering, and related careers that may also lead to transfer to four-year institutions.

Over the next decade, there will be an explosion in the emerging Unmanned Aerial Systems (UAS) industry. With this, a critical need will emerge for skilled drone pilots, technicians, programmers, researchers, and developers. Drone development will grow exponentially during this time, as well as the continued adoption of new and cutting-edge drone technology uses.

4. Explain how the proposed program furthers the statewide implementation plan.
http://cpe.ky.gov/ourwork/strongerbydegrees.html

**Opportunity:** Encourage more people to take advantage of post-secondary opportunities. The UST program will address objective 2 which is to increase the number of high school students ready to enter a postsecondary degree or certification program. Specific strategies addressed with this program include strategies 2.1, 2.7 and 2.8.

Objective 2. Partner with Kentucky’s P-12 system to increase the number of students ready to enter a postsecondary degree or certification program.

- Strategy 2.1. Work with KDE, KHEAA, GEAR UP, the Kentucky College Coaches program, higher education representatives, and other partners to expand and improve advising resources for high school students and families.
- Strategy 2.7. Encourage the development of career pathways in high schools and the use of the Individual Learning Plan (ILP) by postsecondary advisors to encourage and assess students’ career interests and academic strengths.
- Strategy 2.8. Partner with Advance KY, Project Lead the Way, and other similar programs to improve academic instruction and interest in STEM disciplines in high school.

HCTC will work with local high schools and Area Technology Centers (ATCs) to provide advising resources and clearly defined career pathways for high schools to earn dual credit toward the Unmanned Systems Technology AAS, which is a STEM program. HCTC will also work with high schools to create career pathways in unmanned systems. This will further the work of the Kentucky Valley Educational Cooperative (KVEC) Appalachian Technology Initiative (ATI) which has made remarkable progress in three years preparing students for high tech career pathways, in particular unmanned systems, utilizing project-based learning.

**Success** is to increase degree and certificate completion, fill workforce shortages and guide more graduates to a career path. Specific objectives aligned with the implementation for the program include objective 7, strategies 7.1 and 7.2.
Objective 7. Increase the number of KCTCS students who complete career-oriented certificates and associate degree programs and successfully transfer to four-year institutions.

- **Strategy 7.1.** Support KCTCS’s role as a high-quality, low-cost provider of postsecondary education, technical training, and transfer opportunities, and as a key point of access for students with multiple developmental education needs.
- **Strategy 7.2.** Increase 2-year to 4-year transfer by providing more degree pathways, completer (2+2) programs, and transfer advising.

This program will provide students in HCTC’s service region a low cost and high-quality training program by allowing students to pursue the program locally. Additional transfer opportunities include a transfer into aeronautical/aviation with Eastern Kentucky University and Morehead University. Additionally, HCTC is collaboratively working with Embry-Riddle Aeronautical University on a 2 + 2 agreement for their Bachelor of Science in Unmanned Systems Applications to be offered as a program of study through our University Center of Mountains Higher Education Center on HCTC’s Hazard Campus. As an open access institution, allowing students to start where they are in an academic program also aligns with this objective and strategies. Objective 8 and strategies 8.1, 8.2, and 8.3 are also addressed with this program through the instructional programmatic review process.

Objective 8. Promote academic excellence through improvements in teaching and learning.

- **Strategy 8.1.** Promote the use of authentic assessments to evaluate student learning and provide data to inform pedagogy, assignment design, and curriculum review.
- **Strategy 8.2.** Provide more pedagogical training and professional development opportunities for faculty members to strengthen learning and improve student success.
- **Strategy 8.3.** Promote academic quality and continuous improvement of programs and instruction through the implementation of the statewide Review of Existing Programs policy and similar measures.

Annually program coordinators review student outcome data and plan for improvements to the delivery and assessment of curriculum in alignment through SACSOCCs requirements and the statewide review of existing programs policy. HCTC and KCTCS provide professional development and training opportunities to faculty so they remain current in their fields.

**Impact** - Promote economic growth and development and make our state more prosperous by utilizing objective 9, which improves the career readiness and employability of postsecondary education graduates in strategies 9.4, 9.5 and 9.6.

Objective 9. Improve the career readiness and employability of postsecondary education graduates.

- **Strategy 9.4.** Promote regular, meaningful employer involvement in the development and evaluation of postsecondary programs that are relevant to their business/industry.
- **Strategy 9.5.** Identify current and emerging workforce demands, entrepreneurial business opportunities, and stackable credentials that can lead to additional education/training.
• Strategy 9.6. Advance Kentucky’s STEM and health agendas through ongoing leadership, advocacy, and collaboration.

HCTC will align the program need around a program advisory committee, made up of local stakeholders and employers in the field to guide students into high wage occupations with the UST AAS. The addition of several stackable credentials within the AAS allows for very specific training for individuals preparing for STEM related jobs. This program will also work with our entrepreneurial training programs within Workforce Solutions to provide students with avenues to start their own business with the knowledge and skills gained from the UST AAS and related certificates.
B. Program Quality and Student Success

The curriculum should be structured to meet the stated objectives and student learning outcomes of the program.

1. List all student learning outcomes.

Associate of Applied Science in Unmanned Systems Technology

Upon completion of this program, the graduate can:

General Education Competencies:
Students should prepare for twenty-first century challenges by gaining:

A. Knowledge of human cultures and the physical and natural worlds through study in the sciences and mathematics, social sciences, humanities, languages, and the arts.

B. Intellectual and practical skills, including
   ▪ Inquiry and analysis
   ▪ Critical and creative thinking
   ▪ Written and oral communication
   ▪ Quantitative literacy
   ▪ Information literacy
   ▪ Teamwork and problem solving

C. Personal and social responsibility, including
   ▪ Civic knowledge and engagement (local and global)
   ▪ Intercultural knowledge and competence
   ▪ Ethical reasoning and action
   ▪ Foundations and skills for lifelong learning

D. Integrative and applied learning, including synthesis and advanced accomplishment across general and specialized skills.

Technical competencies:

1. Explain U.S. and international regulations and standards.
2. Examine reasonable predictions of how the current unmanned systems technology will integrate into existing careers.
3. Summarize how the Federal Aviation Administration (FAA) constructs and enforces aviation regulations, standards, and law.
4. Explain how to obtain the remote pilot airman/drone certification for small unmanned systems.
5. Read an aeronautical chart and basic mapping concepts.
6. Relate reporting requirements to the FAA such as registration of flight in area, serious injury, loss of consciousness, property damage, or other related small unmanned systems event.
7. Develop a flight plan including mission planning.
8. Complete an end of program assessment for employability in UST career pathways.
Drone Operator Specialist Certificate
1. Explain U.S. and international regulations and standards.
2. Explain how to obtain the remote pilot airman/drone certification for small unmanned systems.
3. Perform proper operational maneuvers.
4. Perform take-offs and landings, as well as emergency procedures.
5. Create a flight plan.
6. Understand reporting requirements to the FAA such as registration of flight in area, serious injury, loss of consciousness, property damage, or other related small unmanned systems event.
7. Complete assessment for employability in UST career paths.

First Responder Specialist Certificate
1. Explain U.S. and international regulations and standards.
2. Explain how to obtain the remote pilot airman/drone certification for small unmanned systems.
3. Understand reporting requirements to the FAA such as registration of flight in area, serious injury, loss of consciousness, property damage, or other related small unmanned systems event.
5. Demonstrate operational understanding of unmanned systems technologies, their respective capabilities, and integration with first responder applications.

GIS/Unmanned Systems Specialist Certificate
1. Explain U.S. and international regulations and standards.
2. Explain how to obtain the remote pilot airman/drone certification for small unmanned systems.
3. Understand reporting requirements to the FAA such as registration of flight in area, serious injury, loss of consciousness, property damage, or other related small unmanned systems event.
4. Interpret, analyze and summarize results of a remote sensing workflow.
5. Describe characteristics of passive and active remote sensing systems (such as multispectral, LiDAR and Radar).

Remote Drone Pilot Certificate
1. Explain U.S. and international regulations and standards.
2. Explain how to obtain the remote pilot airman/drone certification for small unmanned systems.
3. Understand reporting requirements to the FAA such as registration of flight in area, serious injury, loss of consciousness, property damage, or other related small unmanned systems event.

2. Explain how the curriculum achieves the program-level student learning outcomes by describing the relationship between the overall curriculum or the major curricular components and the program objectives.

The 60 credit hour Associate in applied Science UST degree is comprised of general education and technical courses. The general education core will enable KCTCS colleges to graduate
students who are intellectually flexible, articulate, reflective, creative and prepared for continuous learning. For all students, this implies some understanding of the value of higher education and the world of work and career fields related to their own abilities and interests.

The technical outcomes are completed through technical core and elective course work. Competencies are attached to the respective cores and will be assessed in relevant courses. These technical outcomes assure graduates are competent and qualified to enter into the manufacturing sector.

3. Highlight any distinctive qualities of this proposed program.

There are no distinctive qualities of the proposed program

4. Will this program replace any existing program(s) or tracks within an existing program?

The UST program will not replace any existing programming at HCTC.

5. Include the projected faculty/student in major ratio.

The projected ratio is 20 students per faculty in major courses.

6. Is there a specialized accrediting agency related to this program? If yes, identify the agency. Do you plan to seek accreditation? If yes, explain your plans for accreditation. If no, explain your rationale for not seeking accreditation.

No there are no specialized accrediting agency related to this program.

7. Attach SACS Faculty Roster Form.

See Appendix A

8. Describe the library resources available to support this program.

_HCTC Libraries demonstrates support for the College’s mission to provide excellence in teaching and learning, promote student success, and support economic development through its collection of print, non-print, and electronic resources. National standards, approved by the Association of College & Research Libraries (ACRL), are used as a framework for developing library services, collections, and resources. Section 4.1 Policies and Procedures for KCTCS Libraries of the Kentucky Community and Technical College System (KCTCS) Administrative Policies and Procedures describes the mission, administrative structure, general policies and procedures, and services for KCTCS libraries. Library policies concerning check-out and use of materials, services, and resources are available on the library website, and are reviewed and updated annually by the library staff. All policy manuals are available in print form at the library circulation desk. General library information is also provided on page 20 of the HCTC Student Information Guide._
As stated in the HCTC Libraries Manual, the primary mission of the libraries is to support the teaching and research needs of HCTC students, faculty, and staff through its collections and services. To meet these needs, the library is committed to collecting and providing access to the most appropriate sources of information in various formats. Selection of library materials is a multifaceted process which includes faculty, staff, and students under the leadership of the Director of Library Services. Recommendations for resources may be made online via the Services for Students or Services for Faculty link. The library’s collection development policy is outlined on pages 27-30 of the HCTC Libraries Manual.

The library has thousands of physical and electronic books in its collection. Academic, children’s, young adult, and popular, best-selling fiction/nonfiction titles are available for checkout, as well as DVDs and audiobooks on CD. Print magazines and peer-reviewed journals are available in the library, while thousands of articles are also available online through the library’s subscription-based research databases. Course Reserves are available for instructors to place textbooks, additional readings, or videos on reserve in the library for student use for a specified time period.

HCTC Libraries subscribe to electronic databases which provide access to thousands of journal, magazine, and newspaper articles, as well as eBooks, on a variety of subjects. Links to the library's electronic databases are available through the library’s website, or via the A-Z listing from the main LibGuides page. Database tutorials are included within LibGuides.

The following main subscriptions encompass 63 sub-databases, spanning a multitude of disciplines:

1. EBSCOhost - Includes Academic Search Complete, Business Source Premier, CINAHL with Full Text, ERIC, Health Source, Medline, Newspaper Source, Small Business Reference Center, Military and Government Collection and more. This database is accessible through a variety of mobile devices and via a mobile app.
3. Kentucky Virtual Library (KYVL) - Includes EBSCOhost, Novelist, Student Research Center, Grolier Online Passport, ProQuest, WorldCat, Library, Information Science & Technology Abstracts, Learning Express Library, Academic Search Complete, Britannica Digital Learning, and Kentucky Digital Library, as well as links to Kentucky Stats, and Kentucky Vital Statistics. KYVL also provides tutorials on researching, finding books and articles, evaluating information, and citing sources.
4. EBSCO eBook Academic Collection and EBSCO eBook collection – collection of 180,000+ scholarly eBooks from leading publishers, covering the arts, business, education, health & medicine, history, law, literature & language, religion & philosophy, science & technology, and social sciences.
5. ProQuest - Includes Alt-PressWatch, ProQuest Career & Technical Education and Global Newsstream.
6. Additional program specific databases such as ALLDATA, ProDemand are available for
classroom use at the Technical Campus location.

The Voyager online integrated library and cataloging system currently used by all KCTCS libraries. In January of 2019, Primo and ALMA will be the primary methods of access and integrated library system. These systems provide access to print books, electronic books (eBooks), and audiovisual materials (DVDs and audiobooks).

Primo discovery search, subscribed to through a consortium arrangement with all KCTCS libraries, provides simple, one-stop cross-searching of the library catalog and online databases, streamlining the research process, and providing quick results in one relevancy-ranked list. Primo is available on the landing page of the library website. HCTC Libraries also provides tutorials and linked resources via a variety of individual LibGuides. The guides are accessible from the library’s home page.

LibGuides, webpages available through the library’s website and devoted to specific subject areas, provide a starting point for research, and include tutorials on using online databases and the library catalog; understanding the Library of Congress Classification System; finding peer-reviewed sources; and citing sources. Library resources in various formats and recommended links are provided, representing all academic divisions of the campus: Allied Health Science Technologies, Computer & Online Technologies, Heritage, Humanities & Fine Arts, Occupational Technologies and Sciences and Mathematics.

The library makes its resources known to students, faculty, and staff through avenues such as the website, email announcements and social media. Links to library information and resources are included on the Academics and Current Students webpages and within the Blackboard learning management system under the eLibrary tab. Through the eLibrary tab, students can find information on citing sources, basic research techniques, database tips, evaluating resources, understanding call numbers, and the Library of Congress Classification System.

Services

A range of library services are available to students, faculty, staff, and community patrons who live or work in the areas of Breathitt, Perry, Knott and Leslie County. Distance learning and dual credit students are offered the same services and circulation privileges as traditional students. Services include circulation of print and non-print library materials, course reserves, reference assistance, instruction, interlibrary loan, computer labs, printing, wireless network access, a microfilm reader/printer, fax machine, and a photocopier. Library instruction and reference services are provided to individuals and groups, and orientations are developed for designated on-campus and online courses. HCTC Libraries offer public computers at its main locations, 20 at Hazard and 22 at Lees, access to computers at other locations (Technical, Leslie and Knott) is available through open labs. All computers come equipped with campus-wide licensed software allowing for research, online coursework, word processing, and email and Internet access. Multiple black and white printers are supported by the campus print management system, which provides a set number of free copies per semester for students. Group study areas and a Quiet Study area allow opportunities for both collaborative learning or private, individualized study. The “Ask a Question” link on the website allows users to receive one-on-one responses to individual questions in a virtual environment. This is monitored even when the library is closed, so students receive answers and assistance as quickly as possible.
Access

Library hours are Monday, Wednesday and Thursday, 8:00 a.m. to 5:00 p.m. Tuesday, 8:00 a.m. to 7:30 p.m. (Hazard location only) and Friday 8:00 a.m. to 4:30 p.m. during the fall and spring semesters. Summer term hours vary. The website is up-to-date with closures and hours changes. The library’s online resources are available 24 hours a day, seven days a week. All students, faculty, and staff have access to physical as well as online collections. HCTC students (including dual credit students), faculty, and staff are required to have a HCTC library card to check out materials. All on-campus and distance learning students, faculty, and staff, regardless of location, may access college-wide databases remotely, from any computer at any time, via the library’s Muse proxy server. If off campus, users are immediately prompted to enter their KCTCS user name and password for authentication.

The Hazard Campus Library and the Lees College Campus Library offers elevator access. Database subscriptions offer audio options and handicapped accessible computer workstations is available at both locations.

Resource Sharing and Agreements

HCTC Libraries maintains a resource sharing agreement with all KCTCS institutions. The library belongs to the Federation of Kentucky Academic Libraries (FoKAL), allowing HCTC users access to library collections at 48 Kentucky institutions’ when presenting their HCTC library card at participating FoKAL member institutions. HCTC maintains a library services agreement with Lindsey Wilson College and its students, which is evaluated and updated annually. Additionally, HCTC Libraries are members of the Online Computer Library Center (OCLC)/WorldCat and the State Assisted Academic Library Council of Kentucky (SAALCK)—all of which support collaboration and sharing of resources among its organizations. Individual memorandum agreements are signed annually with Alice Lloyd College, Knott County Public Library, Leslie Public Library, Midway University and the Southeast AHEC (Area Health Education Center) Library.

Staffing

HCTC Libraries employs professional staff members, support staff members to carry out the mission of the library. All library support staff have the appropriate education and work experience to successfully perform the duties in their areas of responsibility. The library falls organizationally under Academic Affairs at HCTC, and the organizational chart lists all full-time library staff members, who work on a 12-month basis.

The library employs two full-time professional librarians and four full-time staff. The library is open 44.5 hours per week in the fall and spring semesters. The Staff Directory page of the library website lists contact information for all staff. Students may contact staff members in person, via phone, text, chat or email for research assistance and information, renewals, or technical assistance.
Program Specific Resources for the UST Program

HCTC has adequate program specific resources for the Unmanned Technology Systems Program.

1. EBSCOhost databases contain:
   - Access to 60,734 Full-Text articles and/or eBooks containing the search term “drones OR uav OR unmanned aerial vehicles”

2. Gale Resources 2.0 databases contain:
   - Access to 232,088 Full-Text articles containing the search term “drones OR uav OR unmanned aerial vehicles”

3. ProQuest databases contain:
   - Access to 632,160 Full-Text articles and/or eBooks containing the search term “drones OR uav OR unmanned aerial vehicles”

4. Hazard Campus Library contains:
   - Access to 10 Print books containing the search term “drones”
     - Gregory, Josh. Careers in Drones.
     - Smith, Colin. Aerial Photography.

5. Lees Campus Library contains:
   - Access to 6 Print books containing the search term “drones”
     - Carnahan, Christopher. Drones in Education: Let Your Students’ Imaginations Soar.
     - Lafay, Mark. Drones for Dummies.

6. Credo Reference database contains:
   - Access to 173 Full-text reference entries containing the search term “drones OR uav OR unmanned aerial vehicles”
Total Library Resources for UST = 925,171

A LibGuide has also been created to support the program:

- https://hazard.kctcs.libguides.com/unmannedsystemstech

Other sources also include:

- Federal Aviation Association (FAA) Aviation Learning Center
- FEMA Emergency Management Institute
  https://training.fema.gov/is/crslist.aspx

9. Describe the physical facilities and instructional equipment available to support this program.

A classroom has already been provided for UST instruction through workforce and this classroom will be used for the credit instruction to offer the UST Program courses. This was created in Summer 2017 to support workforce trainings conducted for unmanned systems and will be used to support the instruction of the UST Program. The dedicated space with 2,088 square feet of classroom/lab space. The space is well equipped with ten computers that have specialized and simulation software, 3D design software, a 3D printer, a middle table for class instruction that seats 16-20, one computer/projector, remote teaching/conferencing capabilities, hundreds of tools/accessories, charging stations, three smart televisions and a variety of drones and autonomous aircrafts. Students also have easy access to a computer lab for outside of class review. The addition of the UST Program will have no impact on existing programs and services (physical facilities) at the campus.
### UST Equipment List

<table>
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<tr>
<th>Qty</th>
<th>Item</th>
</tr>
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<tbody>
<tr>
<td>2</td>
<td>DJI Phantom 4 Professional Drones</td>
</tr>
<tr>
<td>7</td>
<td>Batteries for DJI Phantom</td>
</tr>
<tr>
<td>2</td>
<td>DJI Mavic Enterprise Dual w/DJI Shield Plus</td>
</tr>
<tr>
<td>2</td>
<td>Mavic Fly Move Kits with Batteries</td>
</tr>
<tr>
<td>1</td>
<td>Yuneec H520 drone with thermal camera</td>
</tr>
<tr>
<td>1</td>
<td>Aultel Xstar Premium Drone</td>
</tr>
<tr>
<td>3</td>
<td>Batteries for Aultel Xstar</td>
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<tr>
<td>2</td>
<td>35 inch televisions and stands</td>
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<td>1</td>
<td>50 inch television</td>
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<tr>
<td>10</td>
<td>Desktop Computers</td>
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<tr>
<td>10</td>
<td>Simulator Software Packages (Real Flight RC Flight Simulator Software with Interlink-X Transmitter Mode 2)</td>
</tr>
<tr>
<td>4</td>
<td>Inexpensive, indoor Drones Protocol</td>
</tr>
</tbody>
</table>

A fixed wing drone has been requested from Perkins for Fall 2019.

10. Clearly state the admission and retention, and completion standards designed to encourage high quality.

The UST Program will adhere to several key criteria to support admission, retention, and completion standards. These requisites are in place to foster student success and learning.

The program will observe the HCTC admission guidelines that require the following from prospective students:

- A complete application on file
- Official High School Diploma or GED test scores
- Scores from a placement test such as ACT or COMPASS
- An official transcript from all postsecondary institutions attended

11. Clearly state the degree completion requirements for the program.

HCTC Unmanned Systems Technology AAS degree completion requirements will comply with the following KCTCS Academic Guidelines as outlined in the KCTCS Catalog, 2018-19:

Graduation Requirements For the Associate in Arts, Associate in Science, Associate in Fine Arts, and Associate in Applied Science degrees, regardless of the time the student has attended the college, at least 25 percent of the approved curriculum credits must be completed at the KCTCS college granting the degree. For a certificate or diploma, the KCTCS college will grant credentials from its approved program inventory when a minimum of 25 percent of the required coursework has been completed within KCTCS.

Associate in Arts, Associate in Science, Associate in Fine Arts, Associate in Applied Science, and Associate in Applied Technology degrees, students must
satisfactorily complete 60 credits, including the general education requirements as specified in the KCTCS Board of Regents Policies 4.11 and 4.12 and program requirements, with a cumulative grade point average of at least 2.0.

The Unmanned Systems Technology Program also provides a capstone course that integrates prior learning outcomes into a single integrated learning experience. An exit exam that all program graduates must take is included.

12. Provide the following information for the program and for each track (some categories may not apply to all programs):

<table>
<thead>
<tr>
<th>Description</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of hours required for degree</td>
<td>60</td>
</tr>
<tr>
<td>Number of hours in general education</td>
<td>18</td>
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<tr>
<td>Number of hours in degree program core</td>
<td>19</td>
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<tr>
<td>Number of hours in track (concentration area)</td>
<td>23</td>
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<tr>
<td>Number of hours in guided electives</td>
<td>0</td>
</tr>
<tr>
<td>Number of hours in free electives</td>
<td>0</td>
</tr>
</tbody>
</table>

13. Describe how the proposed program will articulate with related programs in the state. It should describe the extent to which student transfer has been explored and coordinated with other institutions.

The UST programs in KCTCS all share a common curriculum, making credit transfer easy. Graduates are able to apply degree credit toward completion programs at most postsecondary institution in the Commonwealth.

14. List courses under the appropriate curricular headings.

See Appendix B

15. Describe planned alternative methods of program delivery involving greater use of technology, distance education, and/or accelerated degree designs, to increase efficiency, better address student educational and workforce needs, and maximize student success, for both traditional and non-traditional students.

The general education courses and select program courses are available via distance learning including communication, social behavioral sciences, heritage/humanities and Quality courses.

The UST technical courses will be provided in state of the art labs with hands on learning opportunities on equipment simulated in real world applications.
C. Program Demand/Unnecessary Duplication

Proposed programs must respond to the needs of the academy and to larger economic and social environments. Thus, the institution must demonstrate demand for the proposed program. All proposed programs must address student demand. Programs must also address either employer demand or academic disciplinary needs.

1. Student Demand: Clearly describe all evidence of student demand, typically in the form of surveys of potential students and/or enrollments in related programs at the institution.

   a. Provide evidence of student demand within your area of geographic responsibility as well as the state and national levels.

   Surveys were distributed to high school guidance counselors to determine the demand within each high school and Area Technology Centers. Six of the ten school districts responded. We asked how many high school students they would have interested in programming within the Unmanned Systems Technology program and related certificates each year for the next three years. The results below show strong demand by students as depicted in the graph below. The following table:

<table>
<thead>
<tr>
<th>Program</th>
<th>Total Number of Student Interested each year in the next three years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unmanned Systems Technology</td>
<td>54</td>
</tr>
<tr>
<td>Integrated Manufacturing Technologies</td>
<td>55</td>
</tr>
<tr>
<td>Machine Tool</td>
<td>73</td>
</tr>
<tr>
<td>Mechatronics</td>
<td>32</td>
</tr>
</tbody>
</table>

   In addition, the Kentucky Valley Educational Cooperative (KVEC) Appalachian Technology Initiative (ATI) has made remarkable progress in three years preparing students for high tech career pathways, in particular unmanned systems, utilizing project-based learning across nineteen schools (Johnson County HS, Middlesboro HS, Hazard Ind. MS, Hazard Ind. HS, Magoffin Co. HS, Paintsville Ind. HS, Knott Co. HS, Belfry HS, Sheldon Clark HS, Ashland Ind. HS, Ashland Ind. MS, Betsy Layne HS, Owsley Co. HS, Breathitt Co. HS, South Floyd MS, Fleming-Neon MS, Wolfe County HS, Clinton Co. MS, and Jackson Ind. HS). Many of these schools are in the HCTC service area and many students involved in the KVEC drone pathway may be feeders to our program.

   b. Identify the applicant pool and how they will be reached.

   Dual credit students will be reached through information sharing with guidance counselors. HCTC’s dual credit coordinator regularly shares information on programming with guidance counselors and students throughout HCTC’s service region. Traditional high school students will be reached through various recruiting events, class presentations, social media and print based marketing materials.
Returning adult students will be reached with social media, discussions with job training partners including EKCEP and other print-based marketing material as well as joint recruiting with employers.

c. Describe the student recruitment and selection process.

College recruiters and program faculty will utilize the existing marketing avenues to recruit students and to promote the UST program. College advisors and other key staff, as well as workforce partners and industry personal, will be made aware of the program so they may also refer potential students. As an open access college and program, students who meet requirements for admission and course pre-requisites will be served based on course capacity. Additionally, connections made through USA Drone Port events have allowed the program to be marketed across the nation.

d. Identify the primary feeders for the program.

The primary feeders of the UST program will be the Area Technology Centers located in area schools. Adult Education Centers and Career Centers will also contribute to the applicant pool. Local employer needs will also drive a pool of students who would need training.

e. Provide any evidence of a projected net increase in total student enrollments to the campus as a result of the proposed program.

The UST program is expected to increase student enrollment and retention in the technical programs. The program will give potential students in the region more opportunities, so they do not have to leave home to access manufacturing programing outside the district; therefore, enrollment should increase.

f. Project estimated student demand for the first five years of the program.

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Student Enrollment</th>
<th>Projected Credential Conferred</th>
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</thead>
<tbody>
<tr>
<td>2019-2020</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>2020-2021</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>2021-2022</td>
<td>20</td>
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<tr>
<td>2022-2023</td>
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<td>15</td>
</tr>
<tr>
<td>2023-2024</td>
<td>30</td>
<td>18</td>
</tr>
</tbody>
</table>

**Spring 2019 – HCTC had 7 completers for the Commercial Drone Pilot Certificate.**
2. Employer Demand: Clearly describe evidence of employer demand. Such evidence may include employer surveys, current labor market analyses, and future human resources projections. Where appropriate, evidence should demonstrate employers’ preferences for graduates of the proposed program over persons having alternative existing credentials and employers’ willingness to pay higher salaries to graduates of the proposed program.

   a. Describe the types of jobs available for graduates, average wages for these jobs, and the number of anticipated openings for each type of jobs in the institution’s area of geographic responsibility.

   The service area for Hazard Community and Technical College currently has very few drone operators, technicians, or similar positions; however, analysis into open positions indicated a strong demand for a variety of skill sets planned in the curriculum with three avenues for jobs and career opportunities for students. First, the local government, economic entities, and local employers indicate active pursuance of operators of unmanned systems, specifically drones, and providing technician services to build and repair unmanned systems. Second, there is opportunity for students to commute to areas where jobs exist while continuing to live in the area. Lastly, the skills and knowledge students will gain from this program will also enable them to pursue entrepreneurial opportunities and self-employment.

   The local governments and economic development groups are actively pursuing manufacturers of aluminum and aerospace parts. HCTC contacted several employers in the region about workers and skills needed utilizing unmanned aerial systems (UAS). Various businesses/employers in the service area have contacted HCTC, including utility companies, surveyors, law enforcement agencies, and first responders, about the need for trained workers. Three businesses have already started in Perry County with direct relation to unmanned systems technology and as they grow, there will be need for additional employment. The current estimated employment in Kentucky in for positions related to unmanned systems such as engineering, technicians, and aerospace is 226 openings.

   Former coal miners (non-traditional students) who need to be retrained as well as high school students represent potential student demand. Surveys in the school districts indicated strong student demand for the UST program.

   b. Describe the types of jobs available for graduates, average wages for these jobs, and the number of anticipated openings for each type of jobs in Kentucky.

   The Kentucky Center for Education and Workforce Statistics report, Kentucky Future Skills, has provided data to project occupation level openings and wages between 2018-2022.

   The current estimated employment in Kentucky for engineering technicians (industrial, mechanical and other) is 380 openings with an average salary of $51,008 and is identified with very fast-growing occupational growth. As the program contains technical training and certificates in drone operations, fabrication, and technician areas, labor market data for these occupations was included. Where UST is a new and emerging field, there is
limited data on actual employment or salary. Indeed.com shows 795 direct unmanned systems positions, such as Drone Operator, Drone Videographer, Site Technician, UAS Test Operator, Flight Services Pilot, Agriculture Services Pilot, Solar Site Technician, Graphics Programmer, Drone Training Program Manager, UAS Specialist, Machine Control Specialist, and Service Technician. An average salary of $35,000 or above is estimated for 446 of the 795 positions, and 349 positions are estimated at $50,000 or above across the nation. Job types includes full-time, part-time, contract, commission, internship, and temporary.

c. Describe the types of jobs available for graduates, average wages for these jobs, and the number of anticipated openings for each type of jobs at the national level.

There is strong national demand for the skills and knowledge obtained through the UST degree and related certificates. At a national level, position openings for industrial engineering technicians is expected to increase .6 percent, and overall employment of aircraft and avionics equipment mechanics and technicians is projected to grow .5 percent from 2016 to 2026, about as fast as the average for all occupations between 2016 and 2026 according to the Bureau of Labor Statistics. As mentioned previously, the unmanned systems technology area is relatively new so data directly related to drones, UAV, UAS, or UST is limited.

3. Academic Disciplinary Needs: Clearly describe all evidence justifying a new program based on changes in the academic discipline or other academic reasons.

   a. If the proposed program is an advanced credential (diploma to AAS), explain the new practice or licensure requirements in the profession and/or requirements by specialized accrediting agencies that necessitate a new program.

      Does not apply

4. Similar programs: A similar program is defined as a program with the same or closely related CIP code at the same degree level. A proposed program will not be considered unnecessarily duplicative if it serves a different student population than existing programs and/or if its curriculum is distinctive from that of existing programs at other public institutions in Kentucky.

   a. Identify similar programs in other SREB states and in the nation.

      Less than a handful of unmanned systems programs were found in the Academic Common Market in SREB state at the bachelor’s degree level, however none were offered specific to the mix of programming at an Associate of Applied Science level within these states listed on SREB.

   b. If CPE records indicate similar programs exist in Kentucky, does the proposed program differ from existing programs in the state? If yes, please explain.

      There are no other AAS programs in the state of Kentucky in Unmanned Systems Technology.
c. Does the proposed program serve a different student population (i.e., students in a different geographic area) from existing programs? If yes, please explain.

Yes. The UST program is designed to serve students in the HCTC service area consisting of Breathitt, Knott, Lee, Leslie, Owsley, Perry and Wolfe counties.

d. Is access to existing programs limited? If yes, please explain.

Yes. Access is limited due to out-of-state locations.

e. Is there excess demand for existing similar programs? If yes, please explain.

No. No other programs currently exist.

f. Is there collaboration between the proposed program and existing programs?

Yes. HCTC communicated with CAOs from all 16 KCTCS colleges to enlist contacts for collaborating on curriculum in the program. JCTC, WKCTC, SKYCTC, and MCTC are the only colleges to respond and meet concerning the creation of the UST curriculum.
D. Cost and Funding of the Proposed Program

The resource requirements and planned sources of funding of the proposed program must be detailed in order to assess the adequacy of the resources to support a quality program. This assessment is to ensure that the program will be efficient in its resource utilization and to assess the impact of this proposed program on the institution’s overall need for funds.

1. Will this program require additional resources? Y or N If yes, provide a brief summary of additional resources that will be needed to implement this program over the next five years.

   Yes, Grant funds in the amount of $27,000 have been requested for the purchase of Unmanned Systems Technology equipment through Perkins. This program will be offered only on the Hazard Campus with a potential future off-site location at the USA Drone Port for the flight mastery class. Sustainability of the program will be provided through revenue from tuition.

2. Will this program impact existing programs and/or organizational units within your institution? If yes, please describe the impact.

   This program utilizes courses from other disciplines currently offered at the college, therefore enrollment in those program courses is expected to increase. Because this is the first engineering program at the college, impacts on other programs is expected to be minimal. The new students expected in the program are intended to be new students who would have gone outside the region for education, or not accessed this type of education at all.

   No curricular changes are expected in other programs which will share classes with the UST program.

   HCTC reviews all programs for viability. Programs which do not have currency in the labor market or enrollment are recommended for discontinuance upon a thoughtful analysis. The UST proposed program will not directly lead to the elimination of a program, however, programs have been suspended on a teach out which were not viable, creating space for the UST program on the Hazard technical campus.

3. Provide adequate documentation to demonstrate sufficient return on investment to the state to offset new costs and justify approval for the proposed program.

   This program will have minimal startup costs because of past workshop offerings. A drone has been added to the Perkins account for the next academic year. A sustainability plan includes generating tuition revenue equal to the costs to run the program, making the program revenue neutral.

   The program has the ability to impact the service area for HCTC greatly in terms of economic development. The jobs provided to graduates and the entrepreneurial opportunities will have a positive impact on the community. The jobs are expected to be high wage jobs, improving the quality of life for the region. The ability to bring in new industry will also have a ripple effect on demand for other goods and services within the region, creating a stronger local revenue base for public goods and services.
**Cost/Funding Explanation**

Complete the following table for the first five years of the proposed program and provide an explanation of how the institution will sustain funding needs. *The total funding and expenses in the table should be the same, or explain sources(s) of additional funding for the proposed program.*

See Appendix C
E. Program Review and Assessment

Describe program evaluation procedures for the proposed program. These procedures may include evaluation of courses and faculty by students, administrators, and departmental personnel as appropriate. Program review procedures shall include standards and guidelines for the assessment of student outcomes implied by the program objectives and consistent with the institutional mission.

1. For each assessment method, please provide indicators of achievement and frequency of data collection:
   a. Which components will be evaluated?
      
      Review of the Unmanned Systems Technology Program and assessment of student learning outcomes will utilize processes already established at HCTC for all technical programs. On an annual basis, each technical program participates in the program review process. One portion of the annual report focuses on quantitative data (enrollment, number of graduates, success on end of program evaluations, employment after graduation, etc.) while another portion of the program review focuses on qualitative data (student evaluation of instruction, graduate surveys, employer surveys, program advisory committee surveys, etc.). All of these data are used by the program coordinator to assess the strengths and weaknesses of the program followed by development of a plan to address the identified weaknesses. The academic Dean and the Chief Academic Officer reviews the program review and comments as needed. As with all other technical programs at HCTC, the Unmanned Systems Technology program will participate in the period program review process conducted by CPE.
   
b. When will the components be evaluated?
      
      HCTC evaluates all programs annually. The annual review includes assessment of program competencies, class and program enrollment, retention and graduation and an overall evaluation of the strengths and weaknesses of the program.
   
c. When will the data be collected?
      
      Data is collected annually by Institutional Effectiveness and provided to program coordinators for review by August of each year.
   
d. How will the data be collected?
      
      Data is collected from a variety of sources, including PeopleSoft Data, surveys of students and graduates as well as information from employers.
   
e. What will be the benchmarks to be achieved?
      
      Benchmarks include established benchmarks for internal assessments of program competencies.
   
f. What individuals or groups will be responsible for data collection?
Program coordinators and institutional effectiveness are responsible for data collection.

g. How will the data and findings be shared with faculty?

Faculty members are directly involved in program review and institutional effectiveness planning and evaluation.

h. How will the data be used for making programmatic improvements?

In the annual program review each program coordinator sets data informed goals for the year, including developing strategies to achieve goals.

2. What are the measures of teaching effectiveness?

Faculty are evaluated annual through the KCTCS Planning, Performance and Evaluation Process. The process involves initial agreement of the faculty member and supervisor and a final performance review and assignment of rating. Additionally, students complete evaluation of faculty.

3. What efforts to improve effectiveness will be pursued based on these measures?

The PPE process requires identification of strength and weaknesses. This allows for plans for improvement and opportunities for professional development to improve teaching effectiveness for the next year.

4. What are the plans to evaluate students’ post-graduate success?

Program coordinators follow up with program graduates and collect data on job placement after graduation. A survey is also administered to employers of graduates regarding the employee performance and employer satisfaction with graduates. Program advisory members also provide input regarding workforce needs and expectations of employees in the fields.
## Appendix A

### Faculty Roster Form

**Qualifications of Full-Time and Part-Time Faculty**

Name of Institution: **Hazard Community and Technical College**

Name of Academic Area, Discipline, Department/School: **Unmanned Systems Technology**

<table>
<thead>
<tr>
<th>Academic Term(s) Included:</th>
<th>Fall 2019; Spring 2020</th>
<th>Date Form Completed: 12/18/2018</th>
</tr>
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<tbody>
<tr>
<td>NAME (F, P)</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>COURSES TAUGHT</td>
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<tr>
<td></td>
<td>Including Term, Course Number &amp; Title, Credit Hours (D, UN, UT, G)</td>
<td></td>
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<tr>
<td></td>
<td>ACADEMIC DEGREES &amp; COURSEWORK Relevant to Course Taught, Including Institution &amp; Major List specific graduate coursework, if needed</td>
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<tr>
<td></td>
<td>OTHER QUALIFICATIONS &amp; COMMENTS Related to Courses Taught</td>
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<tr>
<td>Campbell, Paul (P)</td>
<td>Fall 2019</td>
<td>Department of Criminal Justice Training</td>
</tr>
<tr>
<td></td>
<td>UST 107 Commercial Drone Operations (3 cr) (UN)</td>
<td>• Kentucky Criminalistics Academy 9349 (1454-10J)</td>
</tr>
<tr>
<td></td>
<td>UST 220 First Responder Applications (2 cr) (UN)</td>
<td>• Digital Photography 12623 (1403-16J)</td>
</tr>
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<td></td>
<td>Spring 2020</td>
<td>• Police Radar/Lidar Operator 8463 (0805-08J)</td>
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<td></td>
<td>UST 105 Unmanned Systems Safety and Regs (3 cr) (UN)</td>
<td>• Vehicle Collision Investigations – Level II and III</td>
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<td>UST 107 Commercial Drone Operations (3 cr) (UN)</td>
<td>Certifications</td>
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<tr>
<td></td>
<td></td>
<td>• Commercial UAV Pilot; Certification Date May 2017 – Present, Certification Authority Federal Aviation Administration</td>
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<td></td>
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<td>Work Experience</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Police Officer, 2007 – present, Hazard City Police Department</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Accident Reconstruction using small unmanned aerial systems (sUAS) since 2014</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Webmaster, HPD Website and Facebook page</td>
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<td>Ackerman, George (P)</td>
<td>Fall 2019</td>
<td>HSM 100 Introduction to Homeland Security (3 cr) (UN)</td>
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<tr>
<td>Juris Doctorate,</td>
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<td><strong>Certificates/Certifications</strong></td>
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<tr>
<td>• Firefighter (2002)</td>
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<td>• FDLE Police Certification (2005)</td>
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<td>• CPR Certification (2013)</td>
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<tr>
<td>• EMS/First Responder Certification (2008, 2013)</td>
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| **Federal Emergency Management Agency (FEMA) Institute** | | | |
| • IS-100 Intro Incident Command System | | | |
| • IS-200.b ICS for Single Resources and Initial Actions Incidents | | | |
| • IS-235.e Emergency Planning | | | |
| • IS-700.b National Incident Management Systems (NIMS), Introduction | | | |
| • IS-800.c National Response Framework, Introduction | | | |
| • IS-22 Are You Ready? An in-depth Guide to Citizen Preparedness | | | |

| **Work Experience** | | | |
| • Esquire, Attorney at Law (2006-present) | | | |
| • Police Officer (2006-2014) | | | |
| • Quality Matters Certified, Subject Matter Expert (2006-2013) | | | |
| • Prior Teaching Experience (since 2005) | | | |

<table>
<thead>
<tr>
<th>Bryant, Jeremiah (F)</th>
<th>Fall 2019/Spring 2020</th>
<th>CIT 125 Intro to Digital Maps (3 cr) (UN)</th>
<th>UST 100 Intro to Unmanned Systems Technology (3 cr) (UN)</th>
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<td><strong>Certificates</strong></td>
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<td>Davidson, Gwendolyn (F)</td>
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**Fall 2019/Spring 2020**

- CIT 125 Intro to Digital Maps (3 cr) (UN)
- UST 100 Intro to Unmanned Systems Technology (3 cr) (UN)
- UST 105 Unmanned Systems Safety and Regs (3 cr) (UN)
- UST 107 Commercial Drone Operations (3 cr) (UN)

- EdD-Educational Leadership and Policy Studies (candidate Spring 2019), Eastern Kentucky University
- MS-Information Systems, Morehead State University
- BS-Computer Forensics & Digital Investigations, Champlain College
- Professional Certificate-Computer Forensics and Digital Investigation, Champlain College
- AAS-Management Information Systems, Hazard Community and Technical College
- AS-Associate of Science, Hazard Community and Technical College
- AA-Associate of Arts, Hazard Community and Technical College

**Certificate/Certifications**

- Cyber Teacher, by Computer Science Teachers Association
- FAA Aviation Learning Center Training
  - Aeronautical Decision Making for Vfr Pilots, FAA
  - Performance and Limitations, FAA
  - The Seven Deadly Aviation Sins-Haste, FAA
  - Part 107 Small Unmanned Aircraft Systems (Suas)

**Work Experience**

- Owner/Consultant Davidson Enterprise IT Services and Consulting (2002-present)
  - Webmaster, Tekburst.com
  - IT Consulting/Technical Training
  - Website Development/Online/Social Media Marketing/eCommerce
  - Data Recovery
  - Image and Video Production
  - Computer Security/Repair and Maintenance
  - Project Planning, Implementation, and Support
  - Webmaster (2002-2004)/Photo Editor (2009-2011), Suzanne Deaton Photography
  - Webmaster and eCommerce (2002-2008), Spectacular Interiors
<table>
<thead>
<tr>
<th>Fall 2019</th>
<th>Spring 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>UST 220 First Responder Applications (2 cr) (UN)</td>
<td>UST 100 Intro to Unmanned Systems Technology (3 cr) (UN)</td>
</tr>
<tr>
<td>UST 221 Crew Resource Management (1 cr) (UN)</td>
<td>UST 105 Unmanned Systems Safety and Regs (3 cr) (UN)</td>
</tr>
<tr>
<td>UST 290 UST Flight Mastery (3 cr) (UN)</td>
<td>UST 107 Commercial Drone Operations (3 cr) (UN)</td>
</tr>
<tr>
<td>UST 295 UST Learning Experience (3 cr) (UN)</td>
<td>UST 170 Drone Media Applications (3 cr) (UN)</td>
</tr>
<tr>
<td>UST 299 UST Capstone Studies (1 cr) (UN)</td>
<td>UST 220 Drone Fabrication and Repair (3 cr) (UN)</td>
</tr>
</tbody>
</table>

MA-Adult & Higher Education, Morehead State University
Bachelor of University Studies, Morehead State University;

Federal Emergency Management Agency (FEMA) Institute
• ICS-100 Intro Incident Command
• IS-200.b ICS for Single Resources and Initial Actions Incidents

Certifications
• Commercial UAV Pilot, Certification Date Jan 2017 – Present, Certification Authority Federal Aviation Administration
• FAA 14107.29 Day time waiver for UAS night flight

Work Experience
• Professional Photographer, Bart Massey Photography, 1998 - present
  -integrated photography with drones in 2016
• Drone Operator, Jan. 2017 - present

Memberships
• American Model Aircraft Association
• Kentucky Aviation Association
• Chamber of Commerce

F, P: Full-time or Part-time; D, UN, UT, G: Developmental, Undergraduate Nontransferable, Undergraduate Transferable, Graduate
# Appendix B
## Course Descriptions

<table>
<thead>
<tr>
<th>Course Prefix</th>
<th>Course #</th>
<th>Course Title</th>
<th>Course Description</th>
<th>Credit Hours</th>
<th>New to Your College</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG</td>
<td>101</td>
<td>Writing I</td>
<td>Focuses on academic writing. Provides instruction in drafting and revising essays that express ideas in Standard English, including reading critically, thinking logically, responding to texts, addressing specific audiences, researching and documenting sources. Includes review of grammar, mechanics and usage. Notes: (a) credit not available by special examination; (b) English 101 and 102 may not be taken concurrently; (c) AP credit in the English Language and Composition category for ENG 101 awarded as indicated by AP scoring chart in current KCTCS catalog. Pre-requisite: Appropriate writing placement score or ENC 091. Lecture: 3 credits (45 contact hours).</td>
<td>3</td>
<td>N</td>
</tr>
<tr>
<td>COM</td>
<td>181</td>
<td>Basic Public Speaking</td>
<td>Applies the basic principles and techniques in research, organization, and delivery of speeches for informative and persuasive speaking purposes. Provides practical platform experience in developing speaking abilities to enable the student to communicate orally in clear, coherent language appropriate to the purpose, occasion, and audience. Prerequisite: Current KCTCS placement scores for college level reading and writing OR Consent of Instructor. Lecture: 3.0 credits (45 contact hours).</td>
<td>3</td>
<td>N</td>
</tr>
<tr>
<td>MAT</td>
<td>116</td>
<td>Technical Mathematics</td>
<td>MAT 116: Includes some mathematical concepts from algebra, geometry, and trigonometry and applications relevant to these topics. Includes unit conversions, variation, measurement of geometric figures, vectors, and solving right and oblique triangles using trigonometry. emphasizes applications in the various technologies. Pre-requisite: MAT 062 or MAT 065 or equivalent as determined by KCTCS placement examination. Lecture: 3.0 credits (45 contact hours).</td>
<td>3</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>OR 150</td>
<td>OR College Algebra</td>
<td>MAT 150: Includes selected topics in algebra and analytic geometry. Develops manipulative skills and concepts required for further study in mathematics. Includes linear, quadratic, polynomial, rational, exponential, logarithmic and piecewise functions; systems of equations; and an introduction to analytic geometry. (Students may not receive credit for both MAT150 and any other College Algebra or Pre-calculus course. Credit not available on the basis of special exam.) Lecture 3 hours</td>
<td>3</td>
<td>N</td>
</tr>
<tr>
<td>POL</td>
<td>101</td>
<td>American Government</td>
<td>Examines national government and the political process in the United States, with emphasis on the Constitution, the President, Congress, and the judicial system. Focuses on the nature of American democracy, political challenges, and opportunities. Lecture: 3.0 credits (45 contact hours).</td>
<td>3</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Natural or Applied Science</td>
<td>Course can be selected from any existing approved course in the Natural or Applied Sciences general education requirements for graduation.</td>
<td>3</td>
<td>N</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Name</td>
<td>Description</td>
<td>Credits</td>
<td>Requirement</td>
<td></td>
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</tbody>
</table>
| CIT 105 OR DPT 100 OR CAD 100 | Intro to Computers OR Intro to 3D Print Technology OR Intro to Computer Aided Design | CIT 105: Provides an introduction to the computer and the convergence of technology as used in today’s global environment. Introduces topics including computer hardware and software, file management, the Internet, e-mail, the social web, green computing, security and computer ethics. Presents basic use of application, programming, systems, and utility software. Basic keyboarding skills are strongly recommended. Prerequisite: RDG 20 or Consent of instructor. Lecture: 3.0 credits (45 contact hours).  
DPT 100: Provides an introduction to the world of additive manufacturing, or more commonly known as three dimensional printing (3DP), and its applications in conjunction with computer technology. Introduces topics including computer hardware and software, 3D printing technology, file management, the Internet, email, the social web, sustainability, security, and computer and intellectual property ethics. Presents basic use of applications, programming, systems, and utility software. Lecture: 2 credit hours (30 contact hours). Lab: 1 credit hour (30 contact hours).  
CAD 100: Introduction to Computer Aided Design Applies fundamental principles and capabilities of CAD, basic drafting conventions, and operations. Provides an in-depth study of computer aided drafting commands, terminology, command utilization, and skill development. Lecture: 1.0 credit (15 contact hours). Laboratory: 2.0 credits (60 contact hours). | 3       | N           |
<p>| BAS 282    | Principles of Marketing                        | Introduces marketing functions as it applies to various types of business organizations with attention to the marketing concept, including the marketing mix of product, price, promotion, and distribution decisions; international marketing; and social responsibility. Pre-requisite: BAS 160 or Consent of Instructor. Lecture: 3.0 credits (45 contact hours) | 3       | N           |
| BAS 267    | Introduction to Business Law                  | Introduces the state and federal court systems, tort and criminal law, law of contracts, partnership, sale of goods, government regulations, bailment, negotiable instruments, methods of research, and the judicial system (discovery, trial, and appellate processes). Lecture: 3.0 credits (45 contact hours). | 3       | N           |
| UST 100    | Intro to Unmanned Systems Technology          | Intro to Unmanned Systems Technology Examine the foundations of unmanned systems technology (UST), including history, elemental systems including payloads, data links, ground support equipment, classes of unmanned systems, categories, basic components, applications, mission planning and control, and launch/recovery systems. Lecture: 3 credit hours (45 contact hours). | 3       | Y           |</p>
<table>
<thead>
<tr>
<th>Course</th>
<th>Prefix</th>
<th>Course #</th>
<th>Course Title</th>
<th>Course Description</th>
<th>Credit Hours</th>
<th>New to Your College</th>
</tr>
</thead>
<tbody>
<tr>
<td>UST</td>
<td>105</td>
<td>Unmanned Systems Safety and Regulations</td>
<td>Explains the current legal considerations of unmanned systems technology operations, provides an outlook on future considerations, and informs students on existing and trending unmanned systems technology related safety standards and regulations. Lecture: 3 credit hours (45 contact hours).</td>
<td>3</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>UST</td>
<td>107</td>
<td>Commercial Drone Applications</td>
<td>Review commercial pilot license certification process and testing procedures required by FAA 107 regulations including air traffic control towers, safety protocols, risk management, weather air space, maintenance and operations of aerial vehicles, and mission plans. Prepares students for FAA-107 certification. Lecture: 3 credit hours (45 contact hours).</td>
<td>3</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>UST</td>
<td>299</td>
<td>UST Capstone Studies</td>
<td>Creates employment related documents, demonstrates proper interviewing skills, and explores employment and careers in the unmanned systems technology area. Prerequisite: UST 107 or Consent of Instructor. Lecture: 1 credit hour (15 contact hours).</td>
<td>1</td>
<td>Y</td>
<td></td>
</tr>
</tbody>
</table>

**Concentration Area Courses (Each is 23 Hours)**

<table>
<thead>
<tr>
<th>Course Prefix</th>
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<th>Course Title</th>
<th>Course Description</th>
<th>Credit Hours</th>
<th>New to Your College</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIT</td>
<td>125</td>
<td>Intro to Digital Maps</td>
<td>Provides basic theories and concepts of geographical information systems including basic GIS capabilities, data analysis, data types, coordinate systems, cartography and mapping concepts. Introduces GIS software using industry-specific applications and technology to provide a conceptual base to build expertise in GIS. Pre-requisite: CIT 105 OR Consent of Instructor. Lecture: 3.0 credits (45 contact hours).</td>
<td>3</td>
<td>N</td>
</tr>
<tr>
<td>UST</td>
<td>221</td>
<td>Crew Resource Management</td>
<td>Provides students with an introduction to the principles and concepts of crew resource management (CRM) through interactive discussion and scenario based analysis as it relates to unmanned systems operations. Discusses CRM markers, principles and concepts of CRM, team building, information transfer, problem solving, risk management and decision making, communications process, conflict resolution and maintaining situational awareness when dealing with UAS automated systems. Pre-requisite: UST 107 or Consent of Instructor. Lecture: 1 credit hour (15 contact hours).</td>
<td>1</td>
<td>Y</td>
</tr>
<tr>
<td>UST</td>
<td>290</td>
<td>UST Flight Mastery</td>
<td>Develop skills in the flight of small unmanned systems, covering pre-flight procedures, take-off, landing, hovering techniques, operation/navigation, crew resource management, and post-flight procedures. Laboratory: 1-3 credit hours (30-90 contact hours).</td>
<td>2</td>
<td>Y</td>
</tr>
<tr>
<td>UST</td>
<td>295</td>
<td>UST Learning Experience (Internship, etc.)</td>
<td>Provides on-the-job experience in small unmanned systems, requiring 40 clock/hours per credit hour of appropriate experience approved by the instructor; requires a learning contract, signed by the students, instructor, and supervisor. Pre-requisite: UST 107 or Consent of Instructor. Laboratory: 1-6 credit hours (30-180 contact hours).</td>
<td>3</td>
<td>Y</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Description</td>
<td>Credits</td>
<td>Elective</td>
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</table>
| HSM 110 OR FRS 204 | Introduction to Emergency Management OR EMT First Responder | HSM 110: Examines the ethical and legal issues in the administration of Homeland Security and its efforts to combat terrorism. Examines the legal powers and ethical standards entrusted in the personnel empowered with the implementation of the issues of Homeland Security. Provides an opportunity to demonstrate knowledge of the ethical and legal complexities and dilemmas involved in the establishment and enactment of policies pertaining to Homeland Security. Lecture: 3.0 credits (45 contact hours).  
FRS 204: EMT First Responder includes first responder (EMS). | 3       | N        |
<p>| CIT 125 | Intro to Digital Maps | Provides basic theories and concepts of geographical information systems including basic GIS capabilities, data analysis, data types, coordinate systems, cartography and mapping concepts. Introduces GIS software using industry-specific applications and technology to provide a conceptual base to build expertise in GIS. Pre-requisite: CIT 105 OR Consent of Instructor. Lecture: 3.0 credits (45 contact hours). | 3       | Y        |
| GIS 145 | Remote Sensing | Introduces remote sensing of the earth with topics that include the physical principles of remote sensing, history and future trends, sensors and their characteristics, image data sources, and image classification and analysis techniques. Pre-requisite or Co-requisite: CIT 125 or consent of instructor. Lecture: 3.0 credits (45 contact hours). | 3       | N        |
| UST 220 | First Responder Applications | Examine fundamental principles of unmanned systems technologies, capabilities, regulations, legal responsibilities, cost and benefit consideration for potential use in law enforcement, fire, rescue, emergency medical and disaster response applications. Pre-requisite: UST 107 or Consent of Instructor. Lecture: 2 credit hours (30 contact hours). | 2       | N        |
| UST 221 | Crew Resource Management | Provides students with an introduction to the principles and concepts of crew resource management (CRM) through interactive discussion and scenario based analysis as it relates to unmanned systems operations. Discusses CRM markers, principles and concepts of CRM, team building, information transfer, problem solving, risk management and decision making, communications process, conflict resolution and maintaining situational awareness when dealing with UAS automated systems. Pre-requisite: UST 107 or Consent of Instructor. Lecture: 1 credit hour (15 contact hours). | 1       | N        |</p>
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Description</th>
<th>Credits</th>
<th>Elective Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIT</td>
<td>111 Computer Hardware and Software Maintenance</td>
<td>Presents a practical view of computer hardware and client operating systems. Covers computer hardware components; troubleshooting, repair, and maintenance; operating system interfaces and management tools; networking components; computer security; and operational procedures. Pre-requisite: (CIT 105 AND MAT 065) OR Consent of Instructor. Lecture: 4.0 credits (60 contact hours).</td>
<td>4</td>
<td>E</td>
</tr>
<tr>
<td>CIT</td>
<td>160 Introduction to Networking</td>
<td>Introduces technical level concepts of non-vendor specific networking including technologies, media, topologies, devices, management tools, and security. Provides the basics of how to manage, maintain, troubleshoot, install, operate, and configure basic network infrastructure. Prerequisite: MAT 65 OR Consent of Instructor. Pre-requisite Or Co-requisite: CIT 111 OR Consent of Instructor Lecture: 4.0 credits (60 contact hours).</td>
<td>4</td>
<td>E</td>
</tr>
<tr>
<td>DPT</td>
<td>102 3D Printing Fundamentals</td>
<td>Provides an introduction to the world of three-dimensional (3D) printing or additive manufacturing (AM) and its applications. Introduces topics including 3D printing technologies, basic use of 3D applications, programming, systems, 3D-scanning, and utility software. Pre-requisite or Co-requisite: CIT 105, demonstration of digital literacy competency by exam or certificate, or other approved course with digital literacy status. Lecture/Lab: 2.0 credits (45 contact hours).</td>
<td>3</td>
<td>E</td>
</tr>
<tr>
<td>UST</td>
<td>200 Drone Fabrication and Repair</td>
<td></td>
<td>4</td>
<td>N</td>
</tr>
<tr>
<td>GIS</td>
<td>125 Intro to Digital Maps</td>
<td>Provides basic theories and concepts of geographical information systems including basic GIS capabilities, data analysis, data types, coordinate systems, cartography and mapping concepts. Introduces GIS software using industry-specific applications and technology to provide a conceptual base to build expertise in GIS. Pre-requisite: CIT 105 OR Consent of Instructor. Lecture: 3.0 credits (45 contact hours).</td>
<td>3</td>
<td>E</td>
</tr>
<tr>
<td>CIT</td>
<td>225 GIS Data Analysis</td>
<td>Explores Geographical Information System extensions. Introduces and identifies popular advanced extensions used for image analysis, spatial analysis, and 3D analysis. Collection and analysis of field data utilizing GPS devices and data collection applications. Pre-requisite: CIT 125 or Consent of Instructor. Lecture: 3.0 credits (45 contact hours).</td>
<td>3</td>
<td>E</td>
</tr>
<tr>
<td>GIS</td>
<td>145 Remote Sensing</td>
<td>Introduces remote sensing of the earth with topics that include the physical principles of remote sensing, history and future trends, sensors and their characteristics, image data sources, and image classification and analysis techniques. Pre-requisite or Co-requisite: CIT 125 or consent of instructor. Lecture: 3.0 credits (45 contact hours).</td>
<td>3</td>
<td>E</td>
</tr>
<tr>
<td>Course Prefix</td>
<td>Course #</td>
<td>Course Title</td>
<td>Course Description</td>
<td>Credit Hours</td>
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<tr>
<td>GIS</td>
<td>255</td>
<td>Geospatial Programming</td>
<td>Examines customization of GIS software applications by way of modified service interface elements while covering topics in theory and implementation of the various scripting languages currently used. Prepares students to solve geospatial problems and streamline GIS workflows through the creation and modification of scripts. Pre-requisite: CIT 125 or consent of instructor. Lecture: 3.0 credits (45 contact hours).</td>
<td></td>
</tr>
<tr>
<td>GIS</td>
<td>260</td>
<td>Geospatial Web Mapping</td>
<td>Introduces the design, publishing, optimization and maintenance of geospatial servers, and basic geospatial web services and applications. Includes an introduction to browser and mobile enabled interactive applications. Pre-requisite: CIT 125 or consent of instructor. Lecture: 3.0 credits (45 contact hours).</td>
<td>3</td>
</tr>
<tr>
<td>CAD</td>
<td>100</td>
<td>Intro to Computer Aided Design</td>
<td>Applies fundamental principles and capabilities of CAD, basic drafting conventions, and operations. Provides an in-depth study of computer aided drafting commands, terminology, command utilization, and skill development. Lecture: 1.0 credit (15 contact hours). Laboratory: 2.0 credits (60 contact hours).</td>
<td>3</td>
</tr>
<tr>
<td>CAD</td>
<td>103</td>
<td>CAD Fundamentals</td>
<td>Provides an introduction to team and project-based study of CAD (Computer Aided Drafting) and its applications in conjunction with current computer technology. Introduces topics that includes computer hardware and software, drafting conventions and operations, file management, the Internet, e-mail, social media, CAD commands and terminology, digital security, and computer and intellectual property ethics; presents basic applications of CAD skills in 2D/3D technical drawing production, programming, systems, and interconnections with other utility software. Lecture/Lab: 4.0 credits (90 contact hours).</td>
<td>3</td>
</tr>
<tr>
<td>CIT</td>
<td>105</td>
<td>Introduction to Computers</td>
<td>Provides an introduction to the computer and the convergence of technology as used in today’s global environment. Introduces topics including computer hardware and software, file management, the Internet, e-mail, the social web, green computing, security and computer ethics. Presents basic use of application, programming, systems, and utility software. Basic keyboarding skills are strongly recommended. Prerequisite: RDG 20 or Consent of instructor. Lecture: 3.0 credits (45 contact hours).</td>
<td>3</td>
</tr>
<tr>
<td>CIT</td>
<td>111</td>
<td>Computer Hardware and Software Maintenance</td>
<td>Presents a practical view of computer hardware and client operating systems. Covers computer hardware components; troubleshooting, repair, and maintenance; operating system interfaces and management tools; networking components; computer security; and operational procedures. Pre-requisite: (CIT 105 AND MAT 065) OR Consent of Instructor. Lecture: 4.0 credits (60 contact hours).</td>
<td>4</td>
</tr>
<tr>
<td>CIT</td>
<td>160</td>
<td>Introduction to Networking</td>
<td>Introduces technical level concepts of non-vendor specific networking including technologies, media, topologies, devices, management tools, and security. Provides the basics of how to manage, maintain, troubleshoot, install, operate, and configure basic network infrastructure. Prerequisite: MAT 65 OR Consent of Instructor. Pre-requisite Or Co-requisite: CIT 111 OR Consent of Instructor Lecture: 4.0 credits (60contact hours).</td>
<td>4</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Description</td>
<td>Pre-requisites</td>
<td>Credits/Lecture Hours</td>
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</tr>
<tr>
<td>CIT 125</td>
<td>Intro to Digital Maps</td>
<td>Provides basic theories and concepts of geographical information systems including basic GIS capabilities, data analysis, data types, coordinate systems, cartography and mapping concepts. Introduces GIS software using industry-specific applications and technology to provide a conceptual base to build expertise in GIS. Pre-requisite: CIT 105 OR Consent of Instructor. Lecture: 3.0 credits (45 contact hours).</td>
<td></td>
<td>3  N</td>
</tr>
<tr>
<td>CIT 225</td>
<td>GIS Data Analysis</td>
<td>Explores Geographical Information System extensions. Introduces and identifies popular advanced extensions used for image analysis, spatial analysis, and 3D analysis. Collection and analysis of field data utilizing GPS devices and data collection applications. Pre-requisite: CIT 125 or Consent of Instructor. Lecture: 3.0 credits (45 contact hours).</td>
<td></td>
<td>3  N</td>
</tr>
<tr>
<td>CRJ 100</td>
<td>Intro to Criminal Justice</td>
<td>Provides an introduction to the philosophical and historical background of agencies of the criminal justice systems, processes, purposes and functions. Includes an evaluation of the criminal justice system today, including trends and career orientation. Pre-requisite: (Current placement scores for RDG 30 or higher or completion of RDG 020) and (Current placement scores for ENC 091 or higher or completion of ENC 090). Lecture: 3.0 credit hours (45 contact hours).</td>
<td></td>
<td>3  N</td>
</tr>
<tr>
<td>DPT 100</td>
<td>Intro to 3D Print Technology</td>
<td>Provides an introduction to the world of additive manufacturing, or more commonly known as three dimensional printing (3DP), and its applications in conjunction with computer technology. Introduces topics including computer hardware and software, 3D printing technology, file management, the Internet, email, the social web, sustainability, security, and computer and intellectual property ethics. Presents basic use of applications, programming, systems, and utility software. Lecture: 2 credit hours (30 contact hours). Lab: 1 credit hour (30 contact hours).</td>
<td></td>
<td>3  N</td>
</tr>
<tr>
<td>DPT 102</td>
<td>3D Printing Fundamentals</td>
<td>Provides an introduction to the world of three-dimensional (3D) printing or additive manufacturing (AM) and its applications. Introduces topics including 3D printing technologies, basic use of 3D applications, programming, systems, 3D-scanning, and utility software. Pre-requisite or Co-requisite: CIT 105, demonstration of digital literacy competency by exam or certificate, or other approved course with digital literacy status. Lecture/Lab: 2.0 credits (45 contact hours).</td>
<td></td>
<td>3  Y</td>
</tr>
<tr>
<td>DPT 150</td>
<td>Intro to Engineering Mechanics for 3D Printing</td>
<td>Provides an introduction to simplified engineering mechanical principles as they apply to 3D printing, or additive manufacturing, designs and products. Requires students to apply concepts related to simple force and stress analysis, material property selection, and deformation to their designs for the purpose of improving functional performance and overall printing success. Explores finishing and post processing techniques to enhance the final appearance and marketability of their printed work. Pre-requisite: DPT 100 or DPT 102. Lecture/Lab: 3.0 credits (60 contact hours).</td>
<td></td>
<td>3  Y</td>
</tr>
<tr>
<td>DPT 280</td>
<td>Special Projects for 3D Printing, Level I</td>
<td>Allows the student to gain intermediate level experience in their prospective fields through projects and tasks assigned by the instructor and based on applications the student may one day experience as a professional. Focuses on various assignments and curriculum as determined by the program instructor. Pre-requisite: DPT 100 or DPT 102. Lecture/Lab: 1.0 credits (30 contact hours)</td>
<td></td>
<td>3  Y</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Description</td>
<td>Units</td>
<td>Corequisite</td>
</tr>
<tr>
<td>------------</td>
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</tr>
<tr>
<td>EET 270</td>
<td>Electrical Motor Controls I</td>
<td>This course addresses the diversity of control devices and applications used in industry today. Safety and electrical lockouts are also included. Pre-requisite: [(ELT 110 or EET 119) with a minimum grade of “C”] or consent of Electrical Technology program advisor(s). Co-requisite: EET 271. Lecture: 2.0 credits (30 contact hours).</td>
<td>2</td>
<td>N</td>
</tr>
<tr>
<td>EET 271</td>
<td>Electrical Motor Controls I Lab</td>
<td>Provides practical experience in the use of control devices and their applications in industry today. Safety and electrical lockouts are included. Pre-requisite: [(ELT 110 or EET 119) with a minimum grade of “C”] or consent of the Electrical Technology program advisor(s). Co-requisite: EET 270. Lab: 2.0 credit (60 contact hours).</td>
<td>2</td>
<td>N</td>
</tr>
<tr>
<td>ELT 110</td>
<td>Circuits I</td>
<td>Introduces application of basic DC and AC circuits, including circuit analysis techniques with discussion of introductory magnetism and transformer principles. Emphasizes design, construction, and troubleshooting of simple DC and AC circuits in laboratory exercises. Pre-requisite: (MAT 065 or equivalent placement level) or Consent of Instructor. Lecture: 3.0 credits (45 contact hours). Laboratory: 2.0 credits (60 contact hours).</td>
<td>5</td>
<td>N</td>
</tr>
<tr>
<td>GIS 145</td>
<td>Remote Sensing</td>
<td>Introduces remote sensing of the earth with topics that include the physical principles of remote sensing, history and future trends, sensors and their characteristics, image data sources, and image classification and analysis techniques. Pre-requisite or Co-requisite: CIT 125 or consent of instructor. Lecture: 3.0 credits (45 contact hours).</td>
<td>3</td>
<td>Y</td>
</tr>
<tr>
<td>GIS 255</td>
<td>Geospatial Programming</td>
<td>Examines customization of GIS software applications by way of modified service interface elements while covering topics in theory and implementation of the various scripting languages currently used. Prepares students to solve geospatial problems and streamline GIS workflows through the creation and modification of scripts. Pre-requisite: CIT 125 or consent of instructor. Lecture: 3.0 credits (45 contact hours).</td>
<td>3</td>
<td>Y</td>
</tr>
<tr>
<td>GIS 260</td>
<td>Geospatial Web Mapping</td>
<td>Introduces the design, publishing, optimization and maintenance of geospatial servers, and basic geospatial web services and applications. Includes an introduction to browser and mobile enabled interactive applications. Pre-requisite: CIT 125 or consent of instructor. Lecture: 3.0 credits (45 contact hours).</td>
<td>3</td>
<td>Y</td>
</tr>
<tr>
<td>UST 102</td>
<td>UST Careers Exploration</td>
<td>Explore different careers where the small unmanned systems are utilized. Identify specific fields of interest in which small unmanned systems are used and explain how the technology is integrated into the field. Lecture: 1 credit hour (15 contact hours).</td>
<td>3</td>
<td>Y</td>
</tr>
<tr>
<td>UST 170</td>
<td>Drone Media Applications</td>
<td>Utilizes small unmanned systems to record events related to photography and real estate. Pre-requisite: UST 107 or Consent of Instructor. Lecture: 3 credit hours (45 contact hours)</td>
<td>1</td>
<td>Y</td>
</tr>
<tr>
<td>UST 200</td>
<td>Drone Fabrication and Repair</td>
<td>Introduces drone fabrication, including safety principals, component selection, heating applications, and basic measurements using the metric system. Emphasizes designing, construction, testing, troubleshooting, and repairing of drones. Lecture: 3 credit hours (45 contact hours). Lab: 3 credit hours (30 contact hours).</td>
<td>3</td>
<td>Y</td>
</tr>
<tr>
<td>UST 220</td>
<td>First Responder Applications</td>
<td>Examine fundamental principles of unmanned systems technologies, capabilities, regulations, legal responsibilities, cost and benefit consideration for potential use in law enforcement, fire, rescue, emergency medical and disaster response applications. Pre-requisite: UST 107 or Consent of Instructor. Lecture: 2 credit hours (30 contact hours).</td>
<td>3</td>
<td>Y</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Code No.</td>
<td>Course Title</td>
<td>Description</td>
<td>Credits</td>
</tr>
<tr>
<td>------------</td>
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<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>UST 221</td>
<td></td>
<td>Crew Resource Management</td>
<td>Provides students with an introduction to the principles and concepts of crew resource management (CRM) through interactive discussion and scenario based analysis as it relates to unmanned systems operations. Discusses CRM markers, principles and concepts of CRM, team building, information transfer, problem solving, risk management and decision making, communications process, conflict resolution and maintaining situational awareness when dealing with UAS automated systems. Pre-requisite: UST 107 or Consent of Instructor. Lecture: 1 credit hour (15 contact hours).</td>
<td>3</td>
</tr>
<tr>
<td>ECO 201</td>
<td></td>
<td>Principles of Macroeconomics</td>
<td>Covers the allocation of scarce resources from the viewpoint of individual economic units. Topics include supply and demand, elasticity, costs, and markets. Lecture: 3 credits (45 contact hours).</td>
<td>4</td>
</tr>
<tr>
<td>ENG 102</td>
<td></td>
<td>Writing II</td>
<td>Emphasizes argumentative writing. Provides further instruction in drafting and systematically revising essays that express ideas in Standard English. Includes continued instruction and practice in reading critically, thinking logically, responding to texts, addressing specific audiences, and researching and documenting credible academic sources. NOTE: Credit is not available by special examination. Pre-requisite: ENG 101. Lecture: 3 credits (45 contact hours)</td>
<td>2</td>
</tr>
<tr>
<td>MAT 155</td>
<td></td>
<td>Trigonometry</td>
<td>Includes the trigonometric functions, identities, multiple analytic formulas, laws of sines and cosines, graphs of trigonometric functions in rectangular and polar coordinates, and solving trigonometric equations. Emphasizes applications in each topic. (Students may not receive credit for both MAT155 and any other trigonometry or pre-calculus course.) Lecture: 3 credits (45 contact hours). Pre-requisite: 1. Math ACT score of 22 or above, 2. Math ACT score of 19 21 with concurrent MAT150, 3. Successful completion of Intermediate Algebra, MAT 126, or equivalent, or 4. Placement exam recommendation.</td>
<td>1</td>
</tr>
<tr>
<td>PHY 151</td>
<td></td>
<td>Introductory Physics I</td>
<td>Focuses on the conceptual principles of mechanics of solids, liquids, gases, heat, and sound using some algebra. Credit is not given to students who already have credit for PHY 201 or PHY 231. Companion lecture to PHY 161 laboratory. Pre-requisite: KCTCS placement in College Algebra or completion of Intermediate Algebra. Lecture: 3 credits (45 contact hours).</td>
<td>3</td>
</tr>
<tr>
<td>STA 220</td>
<td></td>
<td>Statistics</td>
<td>Examines statistical description of sample data including frequency distributions, measures of central tendency, and measures of dispersion. Includes theoretical distributions, statistical estimation, and hypothesis testing. Introduces simple linear regression and correlation. Pre-requisite: MAT 150 or equivalent. Lecture: 3.0 credits (45 contact hours).</td>
<td>3</td>
</tr>
</tbody>
</table>
Appendix C  
5-Year Program Cost Planning

<table>
<thead>
<tr>
<th>A. Funding Sources, by year of program</th>
<th>1&lt;sup&gt;st&lt;/sup&gt; year</th>
<th>2&lt;sup&gt;nd&lt;/sup&gt; Year</th>
<th>3&lt;sup&gt;rd&lt;/sup&gt; Year</th>
<th>4&lt;sup&gt;th&lt;/sup&gt; Year</th>
<th>5&lt;sup&gt;th&lt;/sup&gt; Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Resources Available from Federal Sources</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New:</td>
<td>27,000</td>
<td>20,000</td>
<td>15,000</td>
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<tr>
<td>Existing:</td>
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<td>0</td>
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<tr>
<td>Narrative Explanation/Justification:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Resources Available from Other Non-State Sources</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New:</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Existing:</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>State Resources</td>
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</tr>
<tr>
<td>Existing:</td>
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<td>0</td>
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<td>0</td>
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<tr>
<td>Narrative Explanation/Justification:</td>
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<tr>
<td>Internal</td>
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<tr>
<td>New:</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Existing:</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>Narrative Explanation/Justification:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>This is the match for the federal grant and costs of facilities in the future</td>
</tr>
<tr>
<td>Student Tuition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New:</td>
<td>30,600</td>
<td>61,200</td>
<td>102,000</td>
<td>153,000</td>
<td>153,000</td>
</tr>
<tr>
<td>Existing:</td>
<td>0</td>
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<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>Narrative Explanation/Justification:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Initial implementation, we will plan for 6 full time equivalent students in the first year, then 12 full time equivalent students the second year and 20 the third year and 30 in year 4 and 5.</td>
</tr>
<tr>
<td>Total</td>
<td>57,600</td>
<td>81,200</td>
<td>117,000</td>
<td>153,000</td>
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<tr>
<td>Existing:</td>
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<td>0</td>
<td>0</td>
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</table>

B. Breakdown of Budget Expenses/Requirements

<table>
<thead>
<tr>
<th>Staff: Executive, administrative, and managerial</th>
<th>1&lt;sup&gt;st&lt;/sup&gt; year</th>
<th>2&lt;sup&gt;nd&lt;/sup&gt; Year</th>
<th>3&lt;sup&gt;rd&lt;/sup&gt; Year</th>
<th>4&lt;sup&gt;th&lt;/sup&gt; Year</th>
<th>5&lt;sup&gt;th&lt;/sup&gt; Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>New:</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Existing:</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

| Other professional                              | 0                   | 0                   | 0                   | 0                   | 0                   |
| New:                                            | 0                   | 0                   | 0                   | 0                   | 0                   |
| Existing:                                       | 0                   | 0                   | 0                   | 0                   | 0                   |

| Faculty                                         | 0                   | 53,253              | 53,785              | 54,323              |
| New:                                            | 0                   |                     |                     |                     |
| Existing:                                       | 15,367              | 17,525              | 0                   | 0                   |

37
<table>
<thead>
<tr>
<th><strong>Student Employees</strong></th>
<th>New:</th>
<th>0</th>
<th>0</th>
<th>0</th>
<th>0</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Existing:</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Narrative Explanation/Justification:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Equipment and Instructional Materials</strong></td>
<td>New:</td>
<td>27,000</td>
<td>20,000</td>
<td>15,000</td>
<td>15,000</td>
<td>15,000</td>
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<tr>
<td></td>
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<tr>
<td>Narrative Explanation/Justification:</td>
<td>Initial startup equipment funding provided by Perkins grant and possible sequential years.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Library</strong></td>
<td>New:</td>
<td>500</td>
<td>200</td>
<td>200</td>
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<tr>
<td></td>
<td>Existing:</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Narrative Explanation/Justification:</td>
<td>Minimal funds are needed as many courses are already taught in other programs.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Contractual Services</strong></td>
<td>New:</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Existing:</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Narrative Explanation/Justification:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Academic and/or Student Services</strong></td>
<td>New:</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Existing:</td>
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<tr>
<td>Narrative Explanation/Justification:</td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Other Support Services</strong></td>
<td>New:</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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</tr>
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<td>Narrative Explanation/Justification:</td>
<td></td>
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<td></td>
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<td></td>
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<tr>
<td><strong>Faculty Development</strong></td>
<td>New:</td>
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<td>1000</td>
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</tr>
<tr>
<td></td>
<td>Existing:</td>
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<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>Narrative Explanation/Justification:</td>
<td>Additional funds for specific training will be provided to ensure faculty are up to date.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Assessment</strong></td>
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<tr>
<td>Narrative Explanation/Justification:</td>
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<td></td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>New:</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td></td>
<td>Existing:</td>
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<td>0</td>
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<tr>
<td>Narrative Explanation/Justification:</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>New:</td>
<td>28,500</td>
<td>21,200</td>
<td>69,985</td>
<td>69,985</td>
<td>70,523</td>
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<td></td>
<td>Existing:</td>
<td>15,367</td>
<td>17,525</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Appendix D - Letters of Support

RE Brown
★ ★ ★ ★ ★ UNMANNED AERIAL SYSTEMS ★ ★ ★ ★ ★
337 Barron Hill Blvd., Hazard, KY 41701

May 16, 2019

Dr. Jennifer Lindon
Hazard Community and Technical College
One Community College Drive
Hazard, Ky 41701

Dear Dr. Lindon,

RE Brown Unmanned Aerial Systems supports the new credential for Unmanned Systems Technology, including the degree and embedded certificates. We offer services to companies and individuals who may need drone services, but lack the equipment, licensure, or skill set for such services. I received my training through the HCTC drone program in its early form. That training and HCTC instructor Bart Massey, were instrumental in me being able to pass my FAA certification exam on the first attempt, to gain licensure.

Unmanned systems is a new and emerging field that we see as part of our business model. We currently offer the following services to companies and individuals:

- Site Surveys and Radio Tower survey and Inspections
- Roofing Inspections
- House and grounds aerial view
- Weatherproofing using FLIR technology
- We are working with local amateur radio hobbyist on building a mobile radio repeater system that could be deployed on a drone to extend the coverage of a radio repeater system.

We believe this credential could benefit our company and the type of employee that we would hire. We support HCTC’s proposal to obtain this new credential by participating on a program advisory committee, assisting with curriculum development, interviewing potential candidates for employment who have completed a credential in the program, and offering work-based learning opportunities such as internships, when available.

This field is growing and we are excited to provide support and assistance. If you need further information, please feel free to contact me at roland@rebrown.org or 606-335-3928.

Sincerely,

Roland D. Brown II
President
May 10th, 2019

Dr. Jennifer Lindon
Hazard Community and Technical College
One Community College Drive
Hazard, Ky 41701

Greetings Dr. Lindon,

The Perry County Sheriff’s Office, along with other local Law Enforcement Agencies, support the new credential for Unmanned Systems Technology, including the degree and embedded certificates. As you may already be aware, our agency employs the use of Unmanned Technologies in various ways. We have conducted five public safety missions this year alone with the use of an unmanned aircraft system. These missions have involved not only search and rescue but also crime scene photography and collision reconstruction. Simply put, this tool, accompanied by the proper training, has completely changed the landscape of Law Enforcement by offering a means of fulfilling our investigative and response obligations to the public while mitigating risk and cost.

It is the importance of training and education that becomes key to the successful use of these systems which is why we fully support HCTC’s proposed credential program. Even though drone use in a commercial sense is now becoming commonplace, the educational development is still in its infancy. Basically, if we do not offer training and education here now, someone outside of our region will and our local economy will directly feel the impact of which. In a business where experience and education make the difference, our agency is only interested in hiring qualified candidates who can demonstrate command of the subject at hand. Our agency, with regards to Unmanned Systems, would be more apt to hire a police candidate with a UAS credential over a candidate without formal training for several reasons; liability for starters.

We believe this credential will benefit Law Enforcement and especially candidates for hire. We are honored to support HCTC’s proposal to obtain this new credential and are willing to:

- Participate on a program advisory committee
- Participate on a curriculum development team to keep curriculum up-to-date for the field
- Interview potential candidates for employment who have completed a credential in the program
- Offer work-based learning opportunities such as internships, when available and approved by the Sheriff.
To conclude, I would like to thank you and your institution for taking the initiative to offer educational opportunities in Unmanned Systems. We at the PCSO truly feel that this topic is one that will greatly impact Eastern Kentucky in a very positive way. If I can provide any further information, please do not hesitate to contact me.

Respectfully,

[Signature]

Paul Campbell, Detective
Perry County Sheriff's Office
481 Main Street, Suite 200
P.O. Box 7309
Hazard, KY 41701
Perry S.O.: (606) 439-4523
Direct Line: (606) 373-4767
Mobile: (606) 233-2916
Fax: (606) 439-4970
www.perrysheriff.org
May 17, 2019

Dr. Jennifer Lindon
Hazard Community and Technical College
One Community College Drive
Hazard, KY 41701

Dear Dr. Lindon,

I, Evan Massey support the new credential for Unmanned Systems Technology, including the degree and embedded certificates. Drones are the primary tool utilized in our company, American Drone Services. They are an invaluable asset that require training and professionalism to operate and provide a unique visual perspective on the world.

Unmanned systems is a new and emerging field that we see as part of our business model. Drones are used extensively by our FAA 107 certified pilots in command.

We believe this credential could benefit our company and the type of employee that we would hire. We support HCTC’s proposal to obtain this new credential by participating on a program advisory committee, assisting with curriculum development, Interviewing potential candidates for employment who have completed a credential in the program, and offering work-based learning opportunities such as internships, when available.

This field is growing and we are excited to provide support and assistance. If you need further information, please feel free to contact me at Emassey0006@kctcs.edu or (606) 438-3717.

Sincerely,

Evan Massey
American Drone Services
President
606-438-3717
www.americanandroneservices.com
Letter of Support

Chris Stiles
President

May 10, 2019

Dr. Jennifer Lindon
Hazard Community and Technical College
One Community College Drive
Hazard, Ky 41701

Dear Dr. Lindon,

Jabberjay Solutions, LLC. (JSL) supports the new credential for Unmanned Systems Technology, including the degree and embedded certificates. JSL is a recently formed business here in Eastern Kentucky that is focusing on providing a full range of services to include quality drone training, support, and consulting to Government Entities and large Companies both on a National and International scale. JSL’s management team has over 22 years of combined unmanned systems (drone) experience.

Unmanned systems is a new and emerging field that we see as part of our business model. Pilots, maintainers & technicians, safety management, technical documentation, geospatial mapping, and first responder agency support jobs in the unmanned field are all continuing jobs needed in my organization.

We believe this credential could benefit our company and the type of employee that we would hire. We support HCTC’s proposal to obtain this new credential by:

- Participating on a program advisory committee
- Participating on a curriculum development team to keep curriculum up-to-date for the field
- Interviewing potential candidates for employment who have completed a credential in the program
- Offering work-based learning opportunities such as internships, when available.

This field is growing and we are excited to provide support and assistance. If you need further information, please feel free to contact me at cstiles@jabberjay-solutions.com or (859) 321-5043.

Sincerely,

Chris Stiles
President
Jabberjay Solutions, LLC.
May 16, 2019

Dr. Jennifer Lindon  
Hazard Community and Technical College  
One Community College Drive  
Hazard, Ky 41701

Dear Dr. Lindon,

Breeding’s Plumbing and Electric supports the new credential for Unmanned Systems Technology, including the degree and embedded certificates. We are general contracting company that sees many benefits to using unmanned aerial systems in our day to day operations. While we are not currently using drones ourselves, we do have access to a trained UAV pilot who gained his certification through your program.

Unmanned systems is a new and emerging field that we see as part of our business model. Drone technology can be applied in many ways:

Roofing Inspections  
Site Surveys  
Construction planning  
Using drone FLIR technology in the weatherproofing of structures  
Documentation of work in progress for clients

We believe this credential could benefit our company and the type of employee that we would hire. We support HCTC’s proposal to obtain this new credential by participating on a program advisory committee, assisting with curriculum development, Interviewing potential candidates for employment who have completed a credential in the program, and offering work-based learning opportunities such as internships, when available.

This field is growing and we are excited to provide support and assistance. If you need further information, please feel free to contact me at rb_bpe@tvscable or 606-633-5961.

Sincerely,

Roland D. Brown  
Estimator
Proclamation

WHEREAS, with the development, construction and completion of the USA Drone Port: National Unmanned Robotic Research and Development Center, we hope to provide some of the best educational resources in the country, testing facilities for new technologies, and a flexible framework to support innovation; and

WHEREAS, as a result of declining costs, unmanned aircraft have become increasingly available to private citizens for personal, recreational, and other potential uses; and

WHEREAS, the majority of airspace overlying Perry County is Class G, with certain exceptions, so FAA licensed Remote Pilots may fly unmanned aircraft for commercial or pleasure, but only in a lawful manner and with strict adherence to FAA Part 101 and 107, which ever is applicable; and

WHEREAS, diverse career and technical education opportunities prepare students for fulfilling careers by offering integrated courses of study that lead to a qualified workforce with skills in emerging technologies; and

WHEREAS, Perry County desires to be an industry leader and wants to stand out as the very best drone friendly county in the United States; and

NOW, THEREFORE, I, Scott Alexander, County Judge-Executive of Perry County do hereby proclaim Perry County to be known as

A Drone Friendly Community

and urge all citizens to recognize the benefits that can be realized from new and exciting technologies, to vigorously promote this emerging technology to attract and retain the talent necessary to bring Perry County into a leadership role pertaining to drone testing, education, and training.

IN TESTIMONY WHEREOF, I have hereunto set my hand this 28th day of June, 2017.

Scott Alexander
Perry County Judge Executive
While these following letters are in support of the USA Drone Port, it shows a commitment to unmanned systems technology and the educational need.

KENTUCKY AEROSPACE INDUSTRY CONSORTIUM

D. Stewart Ditto II  
Executive Director

255 Bassett Ave  
Lexington, KY 40502  
859-797-8665

June 27, 2017

To Whom It May Concern:

Aerospace is quickly becoming a large part of the Kentucky economy. In 2016, aerospace products was Kentucky’s #1 export at $10.85 billion, which puts us at #2 nationally behind Washington. This unprecedented growth has created a need with in our Commonwealth to continuously work to promote all areas of the aerospace economy in order to continue this positive trend. While in the past Kentucky has been known for tobacco, coal, bourbon, horses, and yes... college basketball, we can now begin to add aerospace into that list.

To continue this growth not only do we need to showcase what is already being done, but we need to pursue new and innovative ideas. This will make Kentucky not just a producer in the industry, but a trailblazer. The Kentucky Aerospace Industry Consortium supports any ideas of Kentuckians to change the face of our Commonwealth in the pursuit of bold possibilities.

We applaud and support the incredible work being done in Knott and Perry County to pursue the “USA Drone Port: National Unmanned Robotic Research and Development Center (NURRDC)” for drone research, testing, training, advanced manufacturing and education. This project has the potential to advance this growing industry in the Commonwealth and create numerous job opportunities in the region as well as the state.

KAIC is very interested in being active with this comprehensive unmanned systems project to help Kentucky continue its positive trend and to truly reach new heights in this burgeoning industry.

Semper Fi,

D. Stewart Ditto II  
1st Lt. USMC (Ret)  
Executive Director  
Kentucky Aerospace Industry Consortium  
stewart@kyaerospace.org
Hazard Police Department

May 23, 2017

Our organization wishes to partner with and utilize the proposed drone port complex in the Knott and Perry County region of southeastern Kentucky.

We agree that the USA Drone Port: National Unmanned Robotic Research and Development Center for drone research, testing, training, advanced manufacturing and education will advance this growing industry in the Commonwealth and create numerous job opportunities in the region as well as the state.

As the holder of an FAA Certificate of Authorization, our agency is obligated to conduct certain flight testing to ensure and maintain the airworthiness of any unmanned aircraft systems operated by us. This includes flight testing after making any modifications to aircraft, sensors, and control stations, including software and firmware upgrades. Our certificated pilots must also maintain flight currency as required by the FAA. The USA Drone Port would provide us with a perfect location to perform those tasks in a safe and professional manner away from densely populated areas. We also require the services of professionals to perform maintenance and troubleshooting on our unmanned systems. We would anticipate being able to obtain these services at the USA Drone Port.

We are very interested in forming an active partnership with this comprehensive unmanned systems project, which includes a strong education component in which your partners will prepare the New Economy workforce in this field.

Sincerely,

[Signature]

Minor B. Allen
Chief of Police

800 High Street, Hazard, Kentucky 41701
(606) 436-2222
Partnership Letter

Unmanned Services, Inc. (USI) is committed to partnering with and utilizing the proposed drone port complex in the Knott and Perry County region of southeastern Kentucky.

We agree that the “USA Drone Port: National Unmanned Robotic Research and Development Center (NURRDC) for drone research, testing, training, advanced manufacturing and education will advance this growing industry in the Commonwealth and create numerous job opportunities in the region as well as the state.

The specific benefits to USI will include:

- Access to Flight Testing Facilities
- Access to Training Facilities
- Access to Rapid Prototyping and Component Assembly Equipment

USI is willing to contribute to the project by:

- Providing Unmanned Systems Knowledge & Expertise
- Provide Industry Consulting & Project Development Assistance

USI is very interested in being active with this comprehensive unmanned systems project which includes a strong education component in which your partners will prepare the New Economy workforce in this field. It will also increase our relationship with local colleges, and other participating partners, as well as the potential social and economic good a project like this has on impacting eastern Kentucky and the Commonwealth as a whole. Unmanned Services, Inc. management has over 50 years of aviation experience and over 30 years in unmanned systems operations, research & development, testing, sensor development, standardization, training and program safety working in the public and private sectors, as well as in academia.

Sincerely,

Chris Stiles
President, Unmanned Services, Inc.
May 26, 2017

To Whom It May Concern

The Aviation program at Eastern Kentucky University would like to partner with and potentially utilize the proposed drone port complex in the Knott and Perry County region of southeastern Kentucky.

We agree that the “USA Drone Port: National Unmanned Robotic Research and Development Center (NURRDC) for drone research, testing, training, advanced manufacturing and education will advance this growing industry in the Commonwealth and create numerous job opportunities in the region as well as the State.

The EKU Aviation program has a long history of providing exceptional pilots, managers and support personnel for the aviation industry. Having the NURRDC in the region provides EKU with the opportunity to develop a program concentration in drone/unmanned to help meet the growing employment needs.

EKU Aviation is very interested in the opportunity to engage with this comprehensive unmanned systems project as we continue to prepare the New Economy workforce in this field.

Sincerely,

Tim Ross, Professor and Chair
Applied Engineering & Technology/Aviation
May 23, 2017

To Whom It May Concern:

The Challenger Learning Center of Kentucky, an informal K-12 STEM education Center, is very interested in the development of the USA Drone Port in the Knott/Perry County region of southeastern Kentucky and partnering with them to provide STEM education opportunities for K-12 students in our region.

We believe that the “USA Drone Port: National Unmanned Robotic Research and Development Center (NURRDC)” for drone research, testing, training, advanced manufacturing and education will advance this growing industry in the Commonwealth and create numerous job opportunities in the region as well as the state.

We believe that our region’s education system will embrace this high tech industry and produce a future pipeline of engineers, technicians, and pilots to design, build, repair, and operate the autonomous vehicles of tomorrow. Having the USA Drone Port located in our region will give our students great inspiration and motivation to pursue careers in the growing STEM field. It will benefit the Challenger Learning Center by giving our students access to a hands-on laboratory where they can build and test their autonomous vehicles in one location while also observing the latest technology on display from companies around the world.

We are very interested in being active with this comprehensive unmanned systems project. We are willing to contribute in any way possible including serving on planning committees or developing new hands-on, educational programs for young people to help create awareness in our region.

We are very excited about this opportunity and eager to see the vision start becoming reality. We believe this project can help diversify our region’s economy away from the extraction industry and toward a more sustainable industry where high tech skills are needed and the jobs pay well.

Sincerely,

[Signature]

Director
Challenger Learning Center of Kentucky
May 20, 2017

Drone and unmanned system colleagues,

As Principal of the Laurel County Schools Center for Innovation (CFI), I am pleased to support and look forward to collaboration with and the opportunity to utilize the proposed drone port complex in the Knott and Perry County region of southeastern Kentucky.

It is well understood by many regional leaders, and I concur, that the “USA Drone Port: National Unmanned Robotic Research and Development Center (NURRDC) for drone research, testing, training, advanced manufacturing and education will advance this emerging industry in the Commonwealth and create numerous job opportunities in the region as well as the state.

A specific benefit to us will be the learning opportunities provided for my Engineering Technology and Industrial Technology students and their being able to study and learn about aviation, aerospace, and emerging technologies in UAV’s. The USA Drone Port aligns well with our programmatic interests in building educational capital and facilitating workforce development in diverse STEM career pathways.

We are very interested in becoming actively involved with this specific comprehensive unmanned systems project that includes a strong education component in which your partners will prepare the New Economy workforce in this field. If I can be of further assistance, please do not hesitate to contact me directly.

[Signature]
James M. Davis, Ed.D.
School Principal

Dr. James M. Davis

Deborah Moore

Vickie Hobbs

Misty Allen

Kristy Reid

Deana Nantz

Ed Bowling

Samantha Bryant

Shannon Sizemore

Chandra Lawson

David Cummins

Jennifer Robinson

Gary Kerr

Jackie Robinson

Shane Smith

Jessica Davis

Clay Massey

Daniel Hampton

J. Scott Weaver