REQUEST FOR A NEW PROGRAM
University of Central Oklahoma

Proposed Name of Program (limited to 30 spaces)
Computer Engineering

Name of Program: (full name of the program if longer than 30 characters)

Degree Designation (ex. B.S., M.A.)
B.S.

Program Director
Nesreen Alsbou

Specially Accredating Agency
ABET

CIP Code: 14.0901 For information regarding CIP codes contact your department chair or visit: http://sites.uco.edu/academic-affairs/irp/program_inventory.asp

Date submitted to Provost Cabinet: 4/1/2020
All proposals for new programs and majors must be presented by the College Dean to the Provost Cabinet for prioritization, planning and approval to proceed.

Dept of Engineering and Physics and Dept of Computer Science
Department submitting the proposal

Yuhao Jiang Yjiang1@uco.edu 5472
Person to contact with questions email address Ext. number

Approved by:

Qian Gang 9/30/20
Department Chair

College Curriculum Committee Chair
(Date) (Please notify department chair when proposal is forwarded to dean.)

College Dean
(Date) (Please notify department chair when proposal is forwarded to AA.)

Academic Affairs Curriculum or Graduate Council
(Date)

Office of Academic Affairs
(Date)

Effective term for this program change
(Assigned by Academic Affairs)

http://www.uco.edu/admin-fac/academic-forms.shtml
Evaluation Criteria

All actions in the approval of new programs for public institutions are subject to a stipulation regarding the program’s ability to attain specified goals that have been established by the institution and approved by the State Regents. At the conclusion of an appropriate period of time, the program’s performance shall be reviewed on the basis of the specified goals in a manner mutually satisfactory to the sponsoring institution and the State Regents. Final endorsement of the program will depend on demonstrated viability.

A. Centrality of the Proposed Program to the Institution’s Mission and Approved Function(s)

A program should adhere to the role and scope of the institution as set forth in its mission statement and as complemented by the institution’s academic plan. List the objectives of the proposed program and explain how the proposed program relates to the institutional mission, academic plan, and approved function(s). An evaluation will be made as to the centrality of the program to the institution’s mission. There are certain circumstances when institutions may request approval to offer programs outside their function as stated in the Functions of Public Institutions policy. However, budget constraints, system efficiency, and concerns about institutional capacity and priorities may further limit expansion of programmatic functions. Requests of this nature should be on a limited basis. (Institution’s response/rationale should follow each criteria, A through I of this policy)

Institutions requesting programs outside their approved programmatic function should contact Dr. Debbie Blanke (405-225-9145) or Dr. Stephanie Beauchamp (405-225-9399) for additional information and forms.

The Department of Computer Science and the Department of Engineering and Physics are pleased to apply for a new undergraduate program in Computer Engineering to be overseen by both departments.

The mission of the University of Central Oklahoma is “to help students learn by providing transformative education experiences to students so that they may become productive, creative, ethical, and engaged citizens and leaders serving our global community. UCO contributes to the intellectual, cultural, economic and social advancement of the communities and individuals it serves.” Central to the mission of the University of Central Oklahoma is to train students with disciplinary knowledge to serve our communities. The proposed program in computer engineering aligns well with UCO’s mission statement of helping students learn by providing transformative education experience. UCO’s six tenets of Transformative Learning (Discipline Knowledge; Leadership; Research, Creative, and Scholarly Activity; Health and Wellness; Global and Cultural Competencies; and Service Learning and Civic Engagement) are well integrated into the computer engineering curriculum. Research, Creative and Scholarly Activities, for example, are implemented through research and design experiences found in courses at all student levels culminating in an intensive senior engineering design capstone experience in each student’s final year. These experiences also provide leadership opportunities since they require that students work in groups with rotating leadership positions.

There is a great demand for computer engineering graduates and hence a new program in computer engineering is much needed. We address demand for the program in detail in section F. Demand for the Program, but we would like to offer a brief vignette here. This program is largely in response to the critical workforce needs in areas related to electrical engineering and computer science, the combination of which is essentially computer engineering. We believe the demand for a computer engineering program will be similar to the demand for computer science and electrical engineering. Over the past eight years at UCO, since the fall of 2012, enrollments in ABET-accredited programs in computer science and electrical engineering have grown slightly more than 35%. In the State of Oklahoma and the metropolitan Oklahoma City area there is a quickly growing need for additional workforce in computation-based disciplines. In the aerospace and other industries, the need is most strong at the interface between electrical engineering and computer science - better known as computer engineering. This need is being driven by the replacement of traditional electro-mechanical controls with software-based controls and the need to secure such

http://www.chighered.org/admin-fac/academic-forms.shtml
systems. We have also received requests from our industrial and government partners at Tinker AFB and elsewhere for computer engineering graduates.

In 2018, Oklahoma was 47th on the State Technology and Science Index, which has demonstrable ties to economic development. Even more striking is that Oklahoma’s rank in the Investment in Human Capital component, which in part depends on the prevalence of science and engineering degrees, is 50th. The proposed computer engineering program will positively impact Oklahoma’s Technology and Science Index by enhancing the environment for innovation, thus making the area more enticing for technology companies considering relocation or places to establish offices and facilities.

According to the Bureau of Labor Statistics, “Computer hardware engineers research, design, develop, and test computer systems and components such as processors, circuit boards, memory devices, networks, and routers.” Computer hardware engineers typically do the following:

- Design new computer hardware, creating schematics of computer equipment to be built
- Test the computer hardware they design
- Analyze the test results and modify the design as needed
- Update existing computer equipment so that it will work with new software
- Oversee the manufacturing process for computer hardware

Many hardware engineers design devices used in manufactured products that incorporate processors and other computer components and that connect to the Internet. For example, many new cars, home appliances, and medical devices have Internet-ready computer systems built into them.

Computer hardware engineers ensure that computer hardware components work together with the latest software. Therefore, hardware engineers often work with software developers. For example, the hardware and software for mobile phones and other devices frequently are developed at the same time.

Computer engineers are often employed to deliver software components that are integral to corresponding hardware including:

- Designing, revising, and testing microcode for computer and communication devices
- Designing, revising, and testing interrupt handlers for general purpose and special purpose computers
- Designing, revising and testing high-performance, device-level, software for communication equipment

Program Objectives:
ABET, the specialized accreditor for this program, requires each accredited program to establish Program Educational Outcomes (PEOs), broad statements that describe what graduates from the program are expected to obtain within a few years of graduation. These objectives must align with the program’s Student Learning Outcomes (SLOs), which are enumerated in Section I (Program Review and Assessment). The PEOs of the B.S. in Computer Engineering are as follows:

1. Graduates of UCO’s Computer Engineering program practice computer engineering excellence in industrial, government, or service fields.
2. Graduates of UCO’s Computer Engineering program participate as members and project leaders on multidisciplinary teams in diverse workplaces and communities.
3. Graduates of UCO’s Computer Engineering program pursue advanced education, research, and development in engineering, scientific, or health related fields.

Student Outcomes:
Students will attain the following:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. an ability to communicate effectively with a range of audiences.
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed
judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

The proposed program is expected to not only help retain current UCO students interested in computer science, engineering, and physics but also attract students nationally and even globally who would like to pursue studies in computer engineering to improve their employability and leadership potential. This proposed program will position students to be stronger job candidates and better employees by developing their disciplinary skills beyond what is available in the scope of other career choices.

Our program of Computer Engineering is also easily distinguishable from others offered in Oklahoma by the amount of computer science in the program and the collaboration of the two departments. It should be noted that, as explained in detail in G. Unnecessary Duplication, the new program is designed to fill computer engineering workforce needs that are not yet met by existing B.S. in Computer Engineering programs at other public institutions in the state of Oklahoma. The proposed program will attract a different group of students who find it difficult to pursue the existing programs at other public institutions due to working full-time jobs to support themselves and families. Specifically, some of most in-demand courses will be offered on weekday evenings to accommodate working students.

The students will benefit from having a metropolitan venue to pursue new skills and further develop their disciplinary competencies. The program will also provide its students with opportunities to network with potential employers and work closely with the faculty, all in a cost-competitive setting that will enhance their professional preparation and leadership potential through transformative learning in problem-solving, research, and teamwork experiences.

UCO operates successful ABET-accredited Electrical Engineering and Computer Science programs. The faculty knowledge base and teaching acumen that underlie these programs are primed to offer a Computer Engineering degree. Faculty, lab facilities and other necessary resources are in place to support the proposed B.S. in Computer Engineering program. With the exception of a few new courses, the undergraduate courses needed to support this program are already offered regularly. The new courses can be added with no additional cost.

B. Curriculum

The curriculum should be structured to meet the stated objectives of the program. Explain how the curriculum achieves the objectives of the program by describing the relationship between the overall curriculum or the major curricular components and the program objectives.

Program objective 1: Graduates of UCO's Computer Engineering program practice computer engineering excellence in industrial, government, or service fields.

The proposed program is designed to prepare students for a starting position in a computer engineering career in industry, government, or other service fields. To this end, the curriculum requires 34 hours of electrical engineering courses, 27 hours of computer science courses, 15 hours of mathematics courses, and 8 hours of physics courses. Besides the required courses, students will choose 9 hours from one of three concentration areas: control systems, cybersecurity engineering, or the Internet of Things concentration.

Program objective 2: Graduates of UCO's Computer Engineering program participate as members and project leaders on multidisciplinary teams in diverse workplaces and communities.

http://www.okhighered.org/admin-fac/academic-forms.shtml
Team projects that require students to put discipline knowledge into practice using the engineering design process are scattered throughout the curriculum. This includes the two-semester capstone courses, ENGR 4842 CE Senior Engineering Design I and ENGR 4892 Senior Engineering Design II, which provide a collaborative senior engineering design experience. Students are able to develop as both leaders and collaborative team players in order to successfully complete these projects, which grow in complexity as the student advances through the curriculum.

Program objective 3: Graduates of UCO's Computer Engineering program pursue advanced education, research, and development in engineering, scientific, or health related fields.

Industrial internships with industry partners can be counted as elective hours. Students are required to submit written and oral presentations of their work using professional engineering standards. Students in Senior Engineering Design are required to present the results of their work at Oklahoma Research Day and at the UCO Engineering Exposition.

For undergraduate degree programs only

As part of the broader work of the Mathematics Success Initiative, the Math Pathways Task Force has identified four gateway mathematics courses that are suitable general education mathematics course options. These courses, *College Algebra/Pre-Calculus, Introduction to Statistics, Functions and Modeling*, and *Quantitative Reasoning*, are included on the Course Equivalency Project transfer matrix and provide rigorous mathematical content that is more relevant and appropriate for specific academic majors.

If the proposed program requires a general education mathematics course, please complete the following questions:

1. Which mathematics course is required as part of the general education requirements? If the program allows for multiple gateway mathematics course options, provide a rationale for each.

   MATH 1513 College Algebra or MATH 1533 Pre-calculus Algebra

   While both courses contain the material required for inclusion on the CEP, MATH 1533 includes additional topics at a higher level of rigor making it a more suitable prerequisite to Calculus I. MATH 1513 is currently on the CEP matrix under the Algebra for STEM pathway. Including this option assists students with transferability, as well as those students who took MATH 1513 prior to the creation of MATH 1533.

2. Describe how the mathematics course was selected and how it best meets the needs of the program’s students.

   MATH 2313 Calculus 1 is required to obtain this degree. MATH 1513 and MATH 1533 both satisfy the algebra prerequisite of Calculus 1.

3. How does this mathematics course articulate with your partner institutions?

   Currently, MATH 1513 is included on the transfer matrix under the Algebra for STEM pathway i.e., the pathway intended for those students progressing on to Calculus 1.

*(For more information regarding the gateway mathematics courses, please contact Dr. Rachel Bates (405) 225-9168)*

The proposed program must meet the State Regents’ minimum curricular standards including the total credit hour requirements for program completion, liberal arts and sciences, general education, and area of specialization credit hour requirements (refer to State Regents’ Policy 3.15 Undergraduate Degree Requirements). Additionally, the curriculum should be compatible with accreditation or certification standards,
where available. Any clinical, practicum, field work, thesis, or dissertation requirements should be included in the proposal.

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

**For Master’s and Doctorate Degrees:**
- Total number of hours required for degree:
- Number of hours in program core:
- Number of hours in option (if applicable):
- Number of hours in thesis/dissertation/project:
- Number of hours in electives (if applicable):

**For Bachelor’s and AA/AS Degrees:**
- Total number of hours required for degree: 126-127
- Number of hours in general education: 43-44
- Number of hours in major: 93 (10 already in gen ed)
  - Number of hours in degree program core (if applicable): 84
  - Number of hours in option (if applicable): NA
  - Number of hours in guided electives (if applicable): 9
  - Number of hours in general electives (if applicable): 0

**For AAS Degrees:**
- Total number of hours required for degree:
- Number of hours in general education:
- Number of hours in technical specialty:
- Number of hours in technical support courses (if applicable):
- Number of hours in technical related coursework (if applicable):

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 majority of transfers into UCO’s programs come from area community colleges. The lower division course transfers from these institutions are nearly always guided by the OSRIHE transfer matrices, which are also shown in UCO’s online transfer guide.

Students may transfer from other institutions at any point in their academic career subject to a 30 credit hour UCO in-residence requirement. Equivalent engineering courses will transfer directly from other ABET accredited programs or with departmental approval. There are two public ABET-accredited Computer Engineering programs in the state, one at Oklahoma State University and the other at the University of Oklahoma. Students who transfer from these institutions often do so because of changing family or job situations that prevent them from remaining full-time students, the appeal of UCO’s generally smaller class sizes, or a changing financial situation that requires a less expensive college choice. There is also a private ABET-accredited Computer Engineering program at Oklahoma Christian University. In the past, UCO has only seen a handful of transfers from private institutions, but their ABET accreditation allows equivalent courses to transfer to UCO’s program.
There are a number of students who begin their coursework at UCO with the intention of transferring to either OU or OSU to complete their degree or to switch to more specialized fields such as aeronautical engineering or petroleum engineering. Others earn their undergraduate degrees at UCO before continuing on to doctoral or master’s programs at one of the Research I institutions. UCO’s ABET accreditation of its engineering programs provides assurance to these institutions that the courses supporting those programs are being offered with an appropriate level of quality and rigor, and that they are acceptable for transfer or will provide sufficient background to pursue advanced degrees.

**Specific curricular information.** List courses under the appropriate curricular headings and asterisk new courses. In the curriculum description, indicate the total number of new courses and how development will be funded. If a course has a prerequisite, list the prerequisite courses in parentheses. NOTE: All prerequisite courses must be included as part of the undergraduate or graduate degree requirements. For undergraduate degrees, specific General Education requirements must be included.

To reduce the cost of the new program, existing courses and resources are utilized for the curriculum. In addition, four new engineering courses have been developed that will support existing programs in addition to this new program:

- **ENGR 4842 CE Senior Engineering Design I:** This course is required to effectively manage the prerequisites needed for students entering into the two-semester engineering senior design capstone courses. Beginning in fall 2020, each engineering discipline will have its own course number (again to manage the differing prerequisites of each program). However, the courses are all taught in a single classroom by a single instructor, so this course will carry no additional cost. Students in each of the engineering disciplines will work collaboratively with students from other engineering disciplines following the model that has worked successfully at UCO for the past 15 years.
- **ENGR 4403 Advanced Control Systems Design & Lab:** This course is being added to support the development of a 3-semester Control Systems sequence requested by and with the support of a Department of Engineering & Physics industry partner (Norick Air Solutions) and with their financial support. While primarily focused on the department’s EE and ME programs, this course sequence was a natural fit as one of the concentrations in this new program.
- **ENGR 4243 Internet of Things Systems & Lab and ENGR 4253 Cybersecurity for IoT Devices & Lab:** These two courses were planned elective additions to the department’s EE program and will support the department’s Internet of Things Research Lab. These courses will make our EE graduates more competitive in this growing field, while also supporting two concentrations in the new Computer Engineering program. These courses will not require new full-time faculty, but may require additional adjuncts to cover lower level courses currently taught by this faculty member.

Cost and funding details can be found in Section H.

**a. General Education**

(1) **Written and Oral Communication (9 hours).**

- English Composition.......................................................... 6
  - ENG 1113 English Composition OR
  - ENG 1143 Comp and Community Service OR
  - ENG 1153 English Composition - Int OR
  - ENG 1173 English Composition Honors
  - ENG 1213 English Composition and Research OR
  - ENG 1223 Comp & Research: International OR
  - ENG 1233 Composition and Research Honors OR
  - ENG 1243 Comp, Community & Research

- Oral Communication.................................................................. 3

http://www.okhighered.org/admin-fac/academic-forms.shtml
MCOM 1113 Fundamentals of Speech

(2) Quantitative Reasoning/Scientific Method (11 hours) – Students in this program must take Calculus I (3 hours) and Physics for Sci. & Engineers I & Lab (4 hours) to satisfy prerequisites for major courses.

Math......................................................................................................................... 3
MATH 2313 Calculus I

Life Science................................................................................................................ 4
BIO 1114 General Biology OR
BIO 1204 Biology I for Majors OR
BIO 1214 & 1214L General Biology and General Bio Lab

Physical Science....................................................................................................... 4
PHY 2014 Physics for Scientists and Engineers I

(3) Critical Inquiry and Aesthetic Analysis (6 hours) Students in this major must take PHIL 1123 Contemporary Moral Problems to satisfy ABET accreditation requirements for training in ethics.

Aesthetic Analysis............................................................................................... 3
HUM 2113 General Humanities Anc-Med OR
HUM 2223 General Humanities Ren-Modern

Critical Inquiry........................................................................................................ 3
PHIL 1123 Contemporary Moral Problems

(4) American Historical and Political Analysis (6 hours).

American National Government............................................................................... 3
POL 1113 American National Government

American History..................................................................................................... 3
HIST 1483 History of US to 1877 OR
HIST 1493 History of US since 1877

(5) Cultural and Language Analysis (3-4 hours)

Second Language.................................................................................................... 4
CHIN 1114 Elementary Chinese I OR
CHIN 1224 Elementary Chinese II OR
FRCH 1114 Elementary French I OR
FRCH 1224 Elementary French II OR
GERM 1114 Elementary German I OR
GERM 1224 Elementary German II OR
JAPN 1114 Elementary Japanese I OR
JAPN 1224 Elementary Japanese II OR
LATN 1114 Elementary Latin I OR
LATN 1224 Elementary Latin II OR
SNSK 1114 Elementary Sanskrit I OR
SNSK 1224 Elementary Sanskrit II OR
SPAN 1114 Elementary Spanish I OR
SPAN 1224 Elementary Spanish II

^ If a student can prove Novice 4 proficiency in a second language either by 2 years of a second language in high school or successful testing, then the student may select three hours from the following cultural analysis courses.

Cultural Analysis............................................................................................... 3
FMKT 2323 Global Diversity and Protocol

(6) Social and Behavioral Analysis (3 hours) – Engineering students must take Introduction to Economics to satisfy ABET and professional requirements for engineering economics.

Social and Behavioral Analysis............................................................................... 3
7) **Life Skills (5 hours)** — satisfied by Healthy Life Skills (2 hours) — engineering students must take ENGR 1213 Engineering Computing and Lab (3 hours).
   Life Skills
   Required Course 2
   HLTH 1112 Healthy Life Skills
   Select from the following elective life skills 3
   ENGR 1213 Engineering Computing & Laboratory

b. **Degree Program Core Courses**

**Major Requirements Courses (93)**

(1) **Physics**

Required courses:
PHY 2014 Physics for Scientists and Engineers I and Lab (P/C: MATH 2323)
PHY 2114 Physics for Scientists and Engineers II and Lab (P: PHY2014; P/C: MATH 2333)

(2) **Engineering**

ENGR 1112 Introduction to Engineering and Laboratory (P/C: MATH 1513 or HS Alg II)
ENGR 1213 Engineering Computing and Laboratory (P/C: MATH 1593)
ENGR 2303 Electrical Science (P: PHY 2114; P/C: ENGR 2311)
ENGR 2311 Electrical Science Laboratory (P/C: ENGR 2303)
ENGR 3223 Digital Logic Design and Laboratory (P: ENGR 2303, ENGR 2311)
ENGR 3303 Engineering Probability and Statistics (P: MATH 2333, PHY 2114) [course change submitted to change to these prerequisites]

#ENGR 3323 Signals and Systems (P: ENGR 2303, ENGR 2311, MATH 3103; Concur: ENGR 3331)
ENGR 3331 Signals and Systems Laboratory (P: ENGR 2311; Concur: ENGR 3323)
ENGR 3403 Analog Electronics (P: ENGR 2303, ENGR 2311; Concur: ENGR 3421)
ENGR 3421 Analog Electronics Laboratory (P: ENGR 2311; Concur: ENGR 3403)
ENGR 3613 Microprocessors and Laboratory (P: ENGR 2303, ENGR 2311, ENGR 3223)

#ENGR 4333 Digital Signal Processing (P: ENGR 3323; Concur: ENGR 4351)
ENGR 4351 Digital Signal Processing Laboratory (P: ENGR 3323, ENGR 3331)

#*ENGR 4842 CE Senior Engineering Design I (P: ENGR 3323, ENGR 3331, ENGR 3403, ENGR 3421, ENGR 3303, ENGR 3613, CMSC 3613, CMSC 3621, CMSC 3833, SE 3103)

#ENGR 4892 — Senior Engineering Design II (P: ENGR: 4842)

**Computer Science**

CMSC 1613 Programming I (P: [MATH 1513 or MATH 1533] and [CMSC 1513 or AP Computer Science or ENGR 1213]; Concur: CMSC 1621) [course change submitted to change to these prerequisites]
CMSC 1621 Programming I Laboratory (P: 1613)
CMSC 2123 Discrete Structures (P: 1613; P/C: MATH 2313)
CMSC 2613 Programming II (P: 1613; Concur: CMSC 2621)
CMSC 2621 Programming II Laboratory (P/C: CMSC 2613)
SE 3103 Object Oriented Software Design and Construction (P: CMSC 2613)
CMSC 3613 Data Structures and Algorithms (P: CMSC 2123, CMSC 2613, MATH 2323 and [STAT 2103 or STAT 2113 or STAT 4113 or ENGR 3303] [course change submitted to change to these prerequisites]
CMSC 3621 Data Structures/Algorithms Lab (P/C: CMSC 3613)

http://www.oklahomaded.org/admin-fac/academic-forms.shtml
CMSC 2833  Computer Organization and Architecture I (P: CMSC 1613) [course change submitted to change to the course name]
CMSC 3833  Computer Organization and Architecture II (P: CMSC 2833 and CMSC 2613) [course change submitted to change to the course name]
CMSC 4133  Concepts of Artificial Intelligence (P: CMSC 3613)

Mathematics.............................................................................................................15
Required courses:
MATH 2313  Calculus 1 (P: [MATH 1533 or MATH 1513] and MATH 1593)
MATH 2323  Calculus 2 (P: MATH 2313)
MATH 2333  Calculus 3 (P: MATH 2323)
MATH 2343  Calculus 4 (P: MATH 2333)
MATH 3103  Differential Equations (P/C: MATH 2343)

Choose one Concentration......................................................................................... 9

Control Systems Concentration (Choose 9 hours from the following)
CMSC 4193  Introduction to Robotics (P: CMSC 3613)
CMSC 4303  Mobile Application Programming (P: CMSC 3103 or SE 3103)
#ENGR 4803  Mechatronics & Lab (P: ENGR 3323, ENGR 3331)
#ENGR 4303  Control Systems (P: ENGR 3323)
##ENGR 4403  Advanced Control Systems Design & Lab (P: ENGR 4303)

Cybersecurity Engineering Concentration (Take these 9 hours)
CMSC 4323  Computer and Network Security (P: CMSC 3613)
#ENGR 4323  Digital and Analog Communications (P: ENGR 3323)
##ENGR 4253  Cybersecurity for Internet of Things Devices & Lab (ENGR 3323)

Internet of Things Concentration (Take these 6 hours)
CMSC 4313  Internet of Things (P: CMSC 2833, SE 3103)
##ENGR 4243  Internet of Things Systems & Lab (P: ENGR 2303, ENGR 2311, ENGR 3223; P/C: ENGR 3613)
(Choose 3 additional hours from the following)
CMSC 4303  Mobile Application Programming (P: CMSC 3103 or SE 3103)
CMSC 4373  Cloud Web Apps Development (P: CMSC 3103 or SE 3103) [course change submitted to change to the course name]
#ENGR 4803  Mechatronics & Lab (P: ENGR 3323, ENGR 3331)

# Admission to Engineering and Physics Upper Division is required to enroll in these courses.

Below is a curriculum flowchart for this program.

http://www.oklahoma.edu/admin-fac/academic-forms.shtml
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C. Academic Standards

Clearly state the admission, retention, and graduation standards which, must be equal to or higher than the State Regents’ policy requirements, and should be designed to encourage high quality.

Admission

Students entering the program must first be admitted to the university. University admission requirements are established by the Oklahoma State Regents for Higher Education (OSRHE) and are specified in the annual UCO catalog (https://www.ucd.edu/academic-affairs/files/ug-catalog/ug-admissions.pdf) and summarized on the university’s admissions website (http://sites.ucd.edu/em/become-a-broncho/apply/Academic-Requirements.asp). These requirements will vary depending on whether a student is a first-time undergraduate or a transfer student, and whether the student is an Oklahoma resident, non-resident, or international student.

Course work in the Computer Engineering Program is divided into “lower division” and “upper division” courses, which roughly mirror the lower and upper division course levels. Prior to taking courses in the upper division, students must be formally admitted into a program’s upper division. This process is currently in place for the Biomedical Engineering, Electrical Engineering, Engineering Physics, and Mechanical Engineering programs.

Upon faculty academic advisor approval, students ready to be admitted into the program’s upper division must make formal application to the Chairperson of the Department of Engineering and Physics. Applications must be submitted to the Department of Engineering and Physics on or before the last Monday of January for Fall admission and the last Monday of August for Spring admission. To be admitted into upper division, the student must have:

a. A minimum retention grade point average (GPA) of 2.00 in all course work completed by the time the student is formally admitted into upper division.

b. Completed 60 semester credit hours by the time the student is formally admitted to upper division.

c. Completed the following courses or their equivalent with a minimum grade of “C” by the time the student is formally admitted into upper division:

- CMSC 1613 Programming I
- CMSC 1621 Programming I Laboratory
- CMSC 2613 Programming II
- CMSC 2621 Programming II Laboratory
- CMSC 2833 Computer Organization and Architecture I
- MATH 2313 Calculus 1
- MATH 2323 Calculus 2
- MATH 2333 Calculus 3
- MATH 2343 Calculus 4
- PHY 2014 Physics for Scientists and Engineers I & Lab
- PHY 2114 Physics for Scientists and Engineers II & Lab
- ENGR 1112 Introduction to Engineering & Lab
- ENGR 1213 Engineering Computing & Lab
- ENGR 2303 Electrical Science
- ENGR 2311 Electrical Science Lab

Formal approval by the departmental Faculty Advisor and Department Chair is required for admission. The student may enroll in no more than nine (9) hours of 3000 and 4000 level courses in the major prior to admission to upper division unless they secure formal approval from the Department of Engineering and Physics.

Students who are unable to meet admission requirements into upper division will be unable to complete this degree program.

Retention

The following is adapted from the 2020-21 UCO catalog (https://www.uco.edu/academic-affairs/files/ug-catalog/ug-generaldegree.pdf):

UCO, in cooperation with OSRHE, has adopted the following policy relating to retention of students pursuing undergraduate course work. The three-phase policy combines an early notification to students experiencing academic difficulties with a gradual increase in overall standards required for retention/continued enrollment at the university. All courses in which a student has a recorded grade (excluding those courses marked as repeated, reprieved, physical education activity, or remedial) will be counted toward the student’s retention grade point average (GPA).

All students at UCO will be classified in one of the following statuses for retention purposes: (Concurrency students: If coursework taken while a concurrent student falls below a cumulative GPA of less than 2.0, please see below under Freshman Academic Notice or Academic Probation).

Academic Good Standing - Any student who meets the retention requirements set forth in this section.

Freshman Academic Notice - Undergraduate students with 30 or fewer credit hours with a retention GPA of 1.7 to 1.99. All students on freshman academic notice for the first time may be required to take UNIV 2012 Success Strategies, a class designed to assist them in their academic recovery.

Academic Notice - Any student whose graduation/retention GPA is above a 2.00 but below the GPA required to graduate with a particular program of study.

Academic Probation - Any student whose retention GPA falls below the retention requirements. Students placed or continued on academic probation must maintain a 2.00 GPA in regularly graded course work (excluding activity or performance courses) for continued enrollment at UCO. Students with less than 30 earned credit hours who are on probation for the first time may be required to take UNIV 2012 Success Strategies, a class designed to assist them in their academic recovery.

Students who raise their retention GPA to meet the retention requirements will be removed from academic probation.

Academic Suspension - Any student who was on academic probation the previous semester will be suspended from the University if s/he fails to raise his or her retention GPA to the required retention GPA level (retention requirements) or achieve a 2.00 semester GPA in regularly graded course work, not to include activity or performance courses. Students not meeting either of these criteria will be immediately suspended and may not be reinstated until one regular semester (fall or spring) has elapsed.

For continued enrollment as a student in academic good standing at the University of Central Oklahoma, a student must have earned a retention grade point average at or above the following:

Retention Requirements 2020 – 2021

<table>
<thead>
<tr>
<th>Credit Hours Attempted</th>
<th>Retention GPA Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>*0 through 30 semester hours</td>
<td>1.7</td>
</tr>
<tr>
<td>31 or greater semester hours</td>
<td>2.0</td>
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http://www.okhighered.org/admin-fao/academic-forms.shtml
*Students with 0-30 semester credit hours with a retention GPA of 1.7 through 1.99 will be considered to be on freshman academic notice.

Students will be removed from academic probation when they have met the minimum requirements above.

At the end of the probationary semester or term, students who continue to fail to make satisfactory progress toward the academic objective, as indicated by the retention requirements, will be suspended for the next regular (fall or spring) semester. Students suspended twice from the University of Central Oklahoma are not eligible to return until they have raised their retention grade point average to a minimum of 2.0 by attendance at another accredited institution.

The catalog provides additional information for suspended students. The university provides a number of programs that target students who are deemed to be at-risk when they are first admitted, as well as programs that support students that have run into academic problems. The Department of Engineering and Physics also provides support for students including the use of drill sessions and help sessions in early lower level courses.

Graduation:

General degree requirements are described annually in the UCO catalog under the section titled “Academic Degree Requirements” (https://www.uco.edu/academic-affairs/files/ug-catalog/ug-generaldegree.pdf). These include:

a. 124 total college level semester hours (this program requires a minimum of 126 credit hours).
b. 30 semester hours at UCO, exclusive of extra-institutional credit.
c. 15 of the last 30 hours applying toward a degree must be completed at UCO.
d. 60 semester hours, excluding physical education activity courses, must be earned from colleges that award bachelor’s degrees (senior colleges/universities).
e. 40 semester hours, excluding physical education activity courses, must be at the upper division (3000 and 4000) level.
f. 15 semester hours of major courses must be at the upper division (3000 and 4000) level.
g. 10 semester hours in the major must be in residence at UCO.
h. 6 semester hours in each minor must be at the upper division (3000 and 4000) level and 6 semester hours must be in residence at UCO.

The catalog link provides additional information related to graduation requirements.

To graduate with a Bachelor of Science in Computer Engineering, students must complete the specific course requirements outlined above. The student’s final grade point average for all college course work and for course work at UCO must be a minimum of 2.00. In addition, a minimum grade of "C" must be earned in all courses in the major requirements to count toward meeting degree requirements.

ABET specifies additional minimum requirements on coursework associated with its accredited engineering degrees (https://www.abet.org/accreditation/accreditation-criteria/criteria-for-accrediting-engineering-programs-2020-2021/):

a. a minimum of 30 semester credit hours (or equivalent) of a combination of college-level mathematics and basic sciences with experimental experience appropriate to the program.
b. a minimum of 45 semester credit hours (or equivalent) of engineering topics appropriate to the program, consisting of engineering and computer sciences and engineering design, and utilizing modern engineering tools.
c. a broad education component that complements the technical content of the curriculum and is consistent with the program educational objectives.
d. a culminating major engineering design experience that 1) incorporates appropriate engineering standards and multiple constraints, and 2) is based on the knowledge and skills acquired in earlier course work.

http://www.okhighered.ok/admin-fac/academic-forms.shtml
ABET requires that each student must be advised regarding curriculum and career matters. This means that all Computer Engineering students are advised by faculty in either the Department of Computer Science or the Department of Engineering and Physics. Student progress is monitored to foster success in attaining student outcomes. Students track progress toward graduation using an online My Degree Plan link (mydegreeplan.ucd.edu). A final formal degree check (https://sites.ucd.edu/em/explore/academic-advisement/forms2/Degree-Check-Form.php) ensures that students have met all requirements for graduation.

D. Faculty

Faculty resources shall be demonstrated to be adequate and appropriate for the proposed program. The number of faculty will meet external standards where appropriate. The qualifications of faculty will support the objectives and curriculum of the proposed program. Faculty qualifications, such as educational background, non-collegiate and collegiate experience, and research and service interests and contributions, which relate to the proposed program, should be summarized. The institution must demonstrate that core programmatic faculty possess the academic and research credentials appropriate to support the program. Attach faculty vita or provide explicit summaries.

Summaries of the qualifications of faculty members supporting this program are provided in the Appendix.

E. Support Resources

Access to the qualitative and quantitative library resources must be appropriate for the proposed program and should meet recognized standards for study at a particular level or in a particular field where such standards are available. Books, periodicals, microfilms, microfiche, monographs, and other collections shall be sufficient in number, quality, and currency to serve the program. Adequacy of electronic access, library facilities, and human resources to service the proposed program in terms of students and faculty will be considered.

Physical facilities and instructional equipment must be adequate to support a high quality program. The proposal must address the availability of classroom, laboratory, and office space as well as any equipment needs. Describe all resources available.

Chambers Library (http://library.ucd.edu) is located on the northwest corner of the University of Central Oklahoma campus and is open over 100 hours each week of the semester. The library holds more than 818,285 items in its collection in all types of formats and circulates more than 45,000 items annually.

The Library serves the research and study needs of students and faculty, and its collections reflect the specialized research interests of the UCO community. Professional librarians serve as liaisons to the academic departments, and each department has a faculty liaison who recommends titles to add to the collection. The library owns or has online access to more than 11,000 engineering books and has spent an average of $3,500 annually for new engineering titles each of the last four years, plus a proportional cost of the ProQuest Academic Complete ebook subscription (approximately $5,200 per college).

The Library uses Alma from ExLibris as its Integrated Management System and Primo as its Discovery Service to enable federated searching through a single interface. The library also offers instruction sessions at faculty request and one-on-one research assistance to students.

The Library subscribes to more than 450 individual engineering journal titles, as well as multiple databases, including IOP, ASME, Compendex, CRCnetBase, Inspec, ACM and IEEE IEL Digital Library, providing full text articles to support the Department of Engineering and Physics programs. Science Direct College Edition and MathSciNet also provide related journal articles. Moreover, the Library subscribes to ProQuest Dissertations & Theses Global, a comprehensive collection of dissertations and theses from around the world. Materials not owned by Chambers Library are obtained through interlibrary loan at no cost to students or faculty.

http://www.okhighered.org/oa/academic-forms.shtml
Library database resources ascribed to the College of Mathematics and Science (CMS) have totaled over $400,000 each year for the last several years. The following databases are identified as directly supporting engineering and computer science programs.

UCO Chambers Library Engineering and Computer Science Databases

Title
ACM Digital Library (Association for Computing Machinery)
American Physical Society Journals and Archive (PROLA)
ASME Package II
Compendex (Engineering Village)
CRCnetBASE
Handbook of Measurement in Science and Engineering
IEEE-Xplore Digital Library (Institute of Electrical and Electronics Engineers)
Inspec
IOPscience Extra (Institute of Physics)
MathSciNet
Science Direct Journals Collection - Physical Sciences Package
Science Direct Reference Works Collection - Physical Sciences
SciFinder Scholar
Web of Science

Physical Facilities and Instructional Equipment

The facilities and equipment that are currently in place are sufficient to meet the requirements for the Computer Engineering program. To support engineering and computer science academic programs and service courses, the college utilizes the following space:

Howell Hall
- 4 lecture classrooms (3023 sf)
- 3 laboratory classrooms (2926 sf)
- 7 instructional laboratories (6955 sf and equipped with 70 computer workstations) and 7 student research laboratories (2178 sf).
- Labs that provide major levels of support to the Electrical Engineering program include a Speech and Image Signal Processing Lab, a Photonics Research Lab, and two Electrical and Electronic Engineering Laboratories. As noted previously, the broad collaborative nature of UCO’s engineering programs results in electrical engineering students also making wide use of facilities devoted primarily to mechanical and biomedical engineering, as well.
- Newly-claimed lab space for the proposed Advanced Control Systems Design Lab. This lab is partly industry-funded and is undergoing renovation at this time. It should be operational during the 2020/2021 academic year.
- Newly-claimed lab space for the proposed Internet of Things Systems (IoT) Lab. This lab is currently being used for IoT research and design projects and will expand to host a new lab course by the end of the 2020/2021 academic year.

The two instructional laboratories that are dedicated to Electrical Engineering and Electronics each support 12 student benches plus a backup bench, which are equipped with the following:

LIST OF EQUIPMENT IN EE I LAB

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Total Qty.</th>
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<tbody>
<tr>
<td>Dell Computer Workstation Optiplex 745</td>
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<tr>
<td>GlobalSpecialties Protoboard Workstation PB-503</td>
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http://www.okhighered.org/admin-fac/academic-forms.shpar
BK Precision Function Generator 20MHz 4040A 13
Tektronix Digital Storage Oscilloscope 100MHz TDS1012 13
Circuit Specialists DC Power Supply CSI5003X5 13
MASTECH Dual Power Supply HY5003 13
BK Precision Benchtop Digital Multimeter 5491B 13
Omega Handheld Multimeter HHM17 13
Extech Handheld Multimeter MiniTec26 13
Handheld C/L Meter MY6243 13

**LIST OF EQUIPMENT IN EE II LAB**

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<td>Dell Computer Workstation Optiplex 390</td>
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<tr>
<td>NI ELVIS II Design Workstation</td>
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<tr>
<td>Tektronix Arbitrary Function Generator 25MHz AFG3022B</td>
<td>13</td>
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<tr>
<td>Tektronix Digital Storage Oscilloscope 100MHz TDS 2014B</td>
<td>13</td>
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<tr>
<td>GWInstek Triple DC Power Supply GPS3303</td>
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<tr>
<td>Fluke Benchtop Digital Multimeter 8845A</td>
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<tr>
<td>Omega Handheld Multimeter HHM17</td>
<td>13</td>
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<tr>
<td>Extech Handheld Multimeter MiniTec26</td>
<td>13</td>
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<tr>
<td>Handheld C/L Meter MY6243</td>
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Adjacent to the EE II Lab is a PCB (Printed Circuit Board) Fabrication Lab. The department also operates a mechanical shop equipped with a Stratasys Objet 30 Pro 3D printer, lathe, Bridgeport mill, and other equipment for student use in engineering design projects.

The department utilizes an Electrical Engineering Laboratory Associate to manage and maintain the electrical engineering laboratories and equipment. The department also utilizes a general Laboratory Manager to oversee ordering of supplies for labs, classrooms, work areas, and student and faculty projects.

The following software is utilized directly in engineering courses: Multisim, Lab VIEW, MATLAB, ANSYS, SolidWorks, C Prog – Cygwin, C-Prog Code Warrior, C-Prog Code Composer Studio, PBasic/PLcBasic, VHDL-Altera Quartus. Students also have access to the following software: Wolfram Mathematica, Multiphysics COMSOL, SPSS 18.0, Adobe Pro, and Microsoft Office Suite – Project Pro, Access, Publisher, SharePoint Designer, Visio Pro.

In addition, the department has access to two College of Mathematics and Science classrooms, one in Old North and the other in the Center for Transformative Learning, along with a classroom at the Carnegie Center in downtown Oklahoma City. Engineering students also work collaboratively with students in other disciplines and are provided space for tutoring and collaboration in the Howel Hall atrium.

**Math and Computer Science (MCS) Building**

Students in the computer engineering program will have 24/7 access to three Linux servers for general computing and web server programming.

In this building there are three computer labs:

1. **MCS-119** (computerized classroom)
   a. 21 general-use workstations (MS Windows)
   b. 1 laser printer

http://www.oklahomaed.org/admin-line/academic-forms.shtml
2. MCS-121 (computerized classroom)
   a. 21 general-use workstations (MS Windows)
   b. 1 laser printer

3. MCS-126 (open lab)
   a. 45 general-use workstations (MS Windows and Mac)
   b. 1 ADA-compliant workstation (MS Windows)
   c. 1 laser printer

Software available in the labs includes:

1. Operating Systems
   a. Ubuntu Linux
   b. MS Windows
   c. Mac OS

2. Web Browsers
   a. Internet Explorer
   b. Mozilla Firefox
   c. Chrome

3. MS Office
   a. Access
   b. Excel
   c. FrontPage
   d. PowerPoint
   e. Project Pro
   f. Publisher
   g. Visio Pro
   h. Word

4. Remote Access
   a. WinSCP
   b. PuTTY

5. Programming Languages and IDEs
   a. MS Visual Studio .NET
   b. J2EE SDK
   c. Turbo Pascal
   d. Fujitsu Cobol
   e. XLISP-PLUS
   f. Amzkl Prolog + Logic Server
   g. Free Pascal
   h. Gnu C++ (Linux server only)
   i. NASM assembler
   j. NetBeans (Java IDE)

6. DBMS
   a. Oracle
   b. MS SQL Server
   c. MySQL
   d. Java DB

7. Other

http://www.easthighered.org/admin-fac/academic-forms.shtml
a. Adobe Acrobat
b. ZipCentral
c. Symantec anti-virus
d. Spybot – Search & Destroy
e. ConTEXT Editor
f. X-Win32
g. MS PowerToys
h. Maple

**Donald Betz STEM Research and Learning Center**
This building was opened in Fall 2018. This 57,000 sf building provides an additional lecture hall and two modular classroom spaces that support lectures and flipped classroom environments. This facility is intentionally interdisciplinary across the College of Mathematics and Science. Space and instrumentation that directly impacts the proposed program are as follows:

**Computational Rehabilitation Research Lab:** (113)
This lab utilizes cutting-edge computational technologies, such as mobile cloud computing, virtual reality, etc., to improve the quality of life for people with disabilities. The lab space consists of a small office for a postdoc/visiting scholar, a storage room for wheelchairs, an open area where we can study wheelchair dynamics, and a conference area where faculty, research assistants and research collaborators can meet and discuss projects.

**Center for Research and Education in Interdisciplinary Computation (CREIC) Data Center (116A):**
This space serves as an academic data center housing computing hardware used in student-centered high performance computing and data enabled science and engineering research and education. Buddy, UCO’s first supercomputer acquired as part of a 2015 National Science Foundation grant, operates in the CREIC Data Center. Buddy is a 37-node cluster supercomputer accessible by faculty and students at UCO. High speed access to Buddy is available in the building at 10 Gbps. The CREIC Data Center provides space, power and cooling for UCO’s growing academic and research computing needs.

**Center for Research and Education in Interdisciplinary Computation Lab (CREICLab):** (116)
This space will serve as the hub of CREIC and an open and accessible work space for student-faculty-staff computational collaborations. CREICLab will serve as a gathering space for videoconferencing and remote collaborations.

**Computer Science and Software Engineering Interdisciplinary Research Lab:** (117)
This lab serves as a shared space for graduate and undergraduate students for original research projects that address challenges in the fields of computer science and software engineering. The lab will accommodate interdisciplinary research activities that advance the academic growth of our students as well as their teamwork and collaboration skills.

**CREIC Computational Classroom:** (120)
This space serves as a full-service classroom hosting courses, workshops, webinars and other larger-scale interactive computational educational offerings. This classroom accommodates UCO courses and activities that engage students-faculty-staff in interactive/hands-on computationally-oriented learning. There are 36 laptops available in this classroom for computational classroom activities. A suite of engineering and computational software is installed on these computers. This classroom supports group-oriented work and has a large projection system as well as six fully-matrixed displays at each table grouping. This technology allows for any computer to be displayed on any screen.

**STEM Lecture Hall:** (101):
This lecture hall seats 80 and has state of the art display technology to accommodate presentations, video, and streaming lecture capture. Currently senior engineering design courses meet in this room and final

[http://www.okhihtred.org/admin-doc/academic-forms.shtml]
design presentations occur here. This will be the space in which computer engineering senior design courses will meet and present.

STEM Transformative Learning Classroom: (102)
This 36-seat room is similar to the CREIC Computational Classroom. Activities in this classroom have access to 36 laptops with most college engineering and computer science software. The room can be reconfigured for traditional lecture or a flipped classroom model.

Faculty Offices
All tenured and tenure-track faculty members have private offices with computers and Internet connections.

F. Demand for the Program

Proposed programs must respond to the needs of the larger economic and social environment. Thus, the institution must demonstrate demand for the proposed program.

1. Student Demand: Clearly describe all evidence of student demand, normally in the form of surveys of potential students and/or enrollments in related programs at the institution, which should be adequate to expect a reasonable level of productivity.

Students have expressed interest in a Computer Engineering program at UCO over the last several years. These anecdotal findings have been supplemented with a survey of current computer science and engineering students. This survey was administered in all computer science and software engineering classes in Spring 2020. The same survey was administered in a subset of engineering courses in Spring 2020. The survey simply asked: “Would you have considered majoring in Computer Engineering if it were available?” The response to this survey strongly indicated that current UCO majors in engineering and computer science would consider majoring in computer engineering. Of the 295 surveyed, 201 answered “yes” to this question. The proposed program would closely align with the existing electrical engineering program at UCO. Hence, double majoring in electrical engineering and computer engineering would require only a few more courses. This pathway is expected to be somewhat common, considering the employment possibilities with this combination of degrees. As described in section G. Unnecessary Duplication, and other sections of this proposal, the proposed program will be unique in its focus on Internet of Things, cybersecurity, and control systems; these focus areas have been chosen based on strategic faculty expertise and metropolitan employer needs. These unique features will encourage students to pursue the Computer Engineering degree, especially considering the demand in the metropolitan area.

2. Employer Demand: Clearly describe all evidence of sufficient employer demand, especially in the five workforce ecosystems developed by the State Department of Commerce that includes aerospace and defense, energy, agriculture and biosciences, information and financial services, and transportation and distribution. This demand can be demonstrated in the form of anticipated openings in an appropriate service area and in relation to existing production of graduates for the institution’s service area and/or state. Such evidence may include employer surveys, current labor market analyses, and future manpower 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.

Several large Oklahoma employers have requested that UCO develop a computer engineering program as evidenced by the comments and commitments in the letters provided in support of this proposal. Both of the departments submitting this proposal have an industrial advisory board that consists primarily of area employers. These employers range across aerospace, defense, energy, and other services. The computer engineering program as proposed was built by considering these employers’ requirements. Specifically, the program has developed concentrations in control systems, cybersecurity engineering, and Internet of Things (IoT) to address these needs.

http://www.oklahomaed.org/admin-fac/academic-forms.shtml
Control Systems Concentration: Aerospace and other industries worldwide are observing a shift of control systems from hardware-based control to software-based control. Systems that were once controlled through a combination of hardware and analog electronics are now being digitally controlled via software. This means a significant amount of software must be developed and maintained to accommodate this shift. This control systems revolution is especially vital in Oklahoma’s aerospace industry. Tinker Air Force Base (TAFB) in Midwest City serves as a maintenance, repair and overhaul facility for a number of air force systems, including software systems. This particular type of software production and maintenance typically requires graduates that have a Computer Engineering degree, which includes a large number of electrical engineering courses. The Federal Aviation Administration (FAA) and aerospace contractors such as Chickasaw Nation Industries, Northrup Grumman and Boeing, all in the Oklahoma City metro area (UCO’s service area), are facing similar issues in terms of the accelerating rate at which software must be produced, upgraded, and maintained.

Oklahoma is also becoming a hub in the heating, ventilation and air-conditioning (HVAC) industry with the expansions of GovernAir, Temptral, Nortek Air Systems, ClimateMaster and others. UCO has developed partnerships with several of these HVAC companies and they have expressed a need for engineers that can understand and manage control systems.

Cybersecurity Engineering Concentration: All organizations are facing issues with cybersecurity. In Oklahoma, this issue impacts the defense, energy, and aerospace industries, as it impacts any company that deploys devices or has services on the internet. In the case of defense systems, such as the facilities and capabilities at TAFB, cybersecurity is a national defense requirement. The proposed cybersecurity engineering concentration is a step toward better preparing graduates to be able to secure software and industrial hardware from external attacks. Another area where cybersecurity is of critical interest is in the energy industry. Engineering Advisory board members from OGE are seeking engineers that can design and integrate security features into devices before the device is deployed rather than through retrofits.

The need for more cybersecurity awareness within engineering disciplines is recognized throughout both academic and industrial settings as highlighted at the 2019 ABET Conference in Dallas where the theme was focused on developing a stronger cybersecurity infrastructure. In response, many institutions are developing new cybersecurity engineering programs that look at the protection of electronics and software systematically. The cybersecurity engineering concentration in this program allows us to meet the current industry needs and to begin building toward this capability in addressing the future needs of Oklahoma industry.

IoT Concentration: The Internet of Things (IoT) is an area within computer engineering that addresses the wide scale deployment of Internet-connected devices. Topics related to the networking of these devices and their exchange of data with each other are of strong interest to the HVAC, energy, medical, agriculture, and transportation industries. Computer engineers in this concentration will focus on the design and development of secure IoT devices that can be used in these and other sectors.

Letters of support for the proposed Computer Engineering program at UCO are provided from leaders in Oklahoma’s private and public industries. Dr. Kristian Olivero, Technical Director of the Oklahoma City Air Logistics Complex at Tinker Air Force Base, estimates that TAFB needs to hire over 100 new computer engineers per year. It cannot be met by existing programs in the state. If one adds in the additional positions in computer engineering that are needed in aerospace, defense, and energy sectors, this estimate would easily reach a need of 150 new computer engineers each year. The proposed program provides opportunities for more Oklahomans to pursue a bachelor’s degree in Computer Engineering to address this need, while also meeting demands for engineers with backgrounds in controls, cybersecurity engineering, and IoT.

Finally, the economic growth of central Oklahoma depends on academic programs that support existing and potential new industry in the region. One way to understand the impact of running a high quality Computer Engineering program is in terms of how the program will help the region. The Milken Institute’s State Technology and Science Index is one way to gauge this potential impact. This index has demonstrable ties to economic development. Unfortunately, Oklahoma’s 2018 Technology and Science Index was 47th. Even more striking is that

http://www.okhighered.org/admin-fac-academic-forms.shtml
Oklahoma's rank in the Investment in Human Capital component, which in part depends on the prevalence of science and engineering degrees, is 50th. The proposed computer engineering program will positively impact Oklahoma's Technology and Science Index, which is closely correlated to economic development.

**Estimated Student Demand for the Program**

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

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Degrees Conferred</th>
<th>Majors (Headcount)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2021-2022</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>2022-2023</td>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td>2023-2024</td>
<td>0</td>
<td>30</td>
</tr>
<tr>
<td>2024-2025</td>
<td>5</td>
<td>40</td>
</tr>
<tr>
<td>2025-2026</td>
<td>8</td>
<td>50</td>
</tr>
</tbody>
</table>

Programs are provisionally approved and given enough time for a planning year plus the number of years necessary to produce one graduating class (i.e. a two-year program is allowed three years to meet its graduates and majors goals, a four-year program is allowed five years, etc.) unless the institution makes a specific timeframe request with a strong rationale.

*Using the above estimated student demand, please indicate the specific productivity criteria and timeframe for final review of the program:*

This program will enroll a minimum of 50 students in fall 2025 year; and will graduate a minimum of 8 students in 2025-2026 academic year.

*(NOTE: Productivity data must come from the same academic year. Example: enroll a minimum of 50 students in fall 2015 and graduate a minimum of 35 students in 2015-2016)*

**Electronic Delivery**

Is this program intended to be offered through online delivery or other computer-mediated format or will be advertised as available through online delivery or other computer-mediated format?

Yes ☐ No ☒

If yes, describe the delivery method that will be used to deliver the program content (e.g., Blackboard, Desire2Learn, etc.) and the major features that will facilitate learning.

NA

Does your institution have prior Electronic Delivered Program approval?

Yes ☒ No ☐

*Note: If requesting institution has not gone through the electronic delivery approval process, you must also complete the Institutional Request for Electronic Delivery Approval section beginning on page 9 of this form.*

http://www.okhighered.org/admin-the/academic-forms.stml
G. Unnecessary Duplication

The elimination of unnecessary program duplication is a high priority of the State Regents. Where other similar programs may serve the same potential student population, the proposed program must be sufficiently different from existing programs or access to existing programs must be sufficiently limited to warrant initiation of a new program.

Provide specific evidence that the proposed program is not unnecessarily duplicative of similar offerings at other state system institutions.

There are two public ABET-accredited Computer Engineering programs in the state, one at Oklahoma State University (OSU) and the other at the University of Oklahoma (OU). There is also one private ABET-accredited Computer Engineering program in the state at Oklahoma Christian University (OC). Computer engineers are traditionally involved in the hardware/software aspects of computers, from the design of individual microcontrollers, microprocessors, personal computers, and supercomputers, to computer interface hardware design. The existing state programs at OSU and OU are traditional computer engineering programs in this sense.

To serve the mission of UCO as Oklahoma’s metropolitan university, a unique B.S. in Computer Engineering program is proposed to support the greater Oklahoma City (OKC) metropolitan area. Specifically, the uniqueness of the proposed program is listed as follows:

1. Support of working students. As a metropolitan university, UCO tends to see much larger numbers of nontraditional students who work full-time or nearly full-time jobs and often support families. Traditional engineering programs are usually out of the question for such students. Many of UCO’s upper and lower division engineering courses are cycled to ensure that they are available in late afternoons and evenings to make it easier for nontraditional students to make satisfactory progress toward their degree without putting their job or family life at risk. Without this flexibility, they would most likely remain in their current job or seek a less rewarding career.

2. Curriculum. The Computer Engineering Program proposed for UCO is more non-traditional with career-specific tracks (options) in
   - Computer Control Systems,
   - Cybersecurity Engineering,
   - Internet of Things (IoT).

In addition, the proposed curriculum for the UCO program has a greater emphasis on the computer software programming of embedded, intelligent systems than the more traditional programs in computer engineering. The design of the program follows the recent trends in Computer Engineering discipline. These tracks and the emphasis on software programming come at the request of local industries in the greater Oklahoma City metropolitan area. The Department of Computer Science and the Department of Engineering and Physics are able to join together to provide quality education for the next generation of computer engineers in the state of Oklahoma.

3. Location. The convenient location of the campus (including UCO’s OKC downtown site) as well as UCO’s designation as Oklahoma’s metropolitan university has shaped the uniqueness of the proposed program, which will be developed to serve the community in the greater OKC metropolitan area. The track in Cybersecurity Engineering will draw from existing expertise and resources available through the W. Roger Webb Forensic Science Institute, which is on UCO’s Edmond campus, and the OSBI Forensic Science Center, which is adjacent to UCO’s Edmond campus.

Have you explored opportunities to collaborate in dual, joint, or consortial programs?

Yes ☐

If yes, explain and, if applicable, attach Memorandum of Understanding and all appropriate documents regarding the dual, joint, or consortial degree plan.

http://www.okhighered.org/admin-fae/academic-forms.shtml
Click here to enter text.

No ❌

If no, explain

Due to the unique features of the proposed program as detailed above, a collaboration or consortial program is not appropriate.

H. 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.

Provide evidence of adequate funding, which will include, but not be limited to:

1. Reallocation of Existing Resources: The institution must provide evidence of campus funds to be reallocated to the proposed program. The source and process of reallocation must be specifically detailed. An analysis of the impact of the reduction on existing programs and/or organization units must be presented.

A fraction of the funds budgeted for the Department of Computer Science and the Department of Engineering and Physics will be reallocated to support the proposed B.S. in Computer Engineering program. There will be no explicit process of reallocation. Existing resources, such as course offerings, faculty, labs, equipment, and library databases, will be shared by the students of the new program.

The impact of the resource reallocation will be minimal to other programs offered by the two departments. While we expect the proposed program to be popular among prospective students, we expect the size of the program at a maximum of 50 students after five years of its creation. An analysis is presented as follows.

First, all the required courses in the proposed curriculum are offered by the department every year. Considering the projected program size of 50 students and they are distributed through eight semesters of studies, we will see on average a slight increase of seven to eight students in each class, which can be easily accommodated within the departments’ current capacity of course offerings.

Second, all the regular elective courses in the proposed curriculum are offered at least once a year. Assuming that the 50 students take an average of three elective courses per year during their last two years of studies, we will again see a slight increase of just seven to eight students in each of the twelve regular elective classes, which can be easily accommodated within the current capacity.

Third, between the two departments there are 29 fulltime faculty members (20 in Engineering & Physics and 9 in Computer Science). Of these, 24 hold a Ph.D. in either engineering or computer science, 14 are tenured faculty, and 5 are tenure-track faculty. The faculty workload increase for the projected 50 students in the new program in terms of senior design projects, advising, etc., is minimal when divided among these faculty members.

The two departments currently have one free-access computer lab, two teaching computer labs, two electrical engineering labs, and several senior design spaces (including an Internet of Things Laboratory) available for use by students in the proposed program. In addition, there are several shared teaching spaces and faculty research labs that focus on interdisciplinary undergraduate research that are also available to students in this program.

http://www.ohiobec.org/admin-fac/academic-rooms.shtml
A new initiative at UCO allows students to remotely access licensed engineering software 24/7, ensuring they can work on homework and projects anytime/anywhere.

2. Tuition and Fees: The institution must provide evidence of a projected increase in total student enrollments to the campus as a result of the proposed program.

Our survey results show that the proposed program will be popular among its prospective students. Therefore, an increase in total student enrollment is projected.

3. Discontinuance or Downsizing of an Existing Program or Organizational Unit: The institution must provide adequate documentation to demonstrate sufficient savings to the state to offset new costs and justify approval for the proposed program.

The proposed program will not cause discontinuance of other existing programs. It may cause some students to enroll in the proposed program who would have enrolled in the existing Computer Science (CS), Electrical Engineering (EE), or Software Engineering programs (SE). However, because of the curriculum differences between these programs, we expect that a large portion of the students will remain in the CS, EE and SE programs.

http://www.okhighered.org/admin-fac/academic-forms.shtml
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 for the life of the proposed program in the absence of additional funds from the State Regents. *The total funding and expenses in the table should be the same, or explain sources(s) of additional funding for the proposed program. (NOTE: Each funding and/or expense amount provided must include an explanation regarding the source of the funds or how the funds will be utilized.)

Cost/Funding Summary:

Program Resource Requirements

<table>
<thead>
<tr>
<th>A. Funding Sources</th>
<th>1st Year</th>
<th>2nd Year</th>
<th>3rd Year</th>
<th>4th Year</th>
<th>5th Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Resources Available from Federal Sources</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Explanation:</strong> Faculty from the Departments of Engineering &amp; Physics and Computer Science that support this program currently receive and will continue to pursue funding from federal grants (National Science Foundation, the National Institute for Health, Department of Education, etc.) and private granting agencies. These funds vary from year to year and are not included in this calculation.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Resources Available from Other Non-State Sources</td>
<td>$4,514</td>
<td>$9,027</td>
<td>$13,541</td>
<td>$18,054</td>
<td>$22,568</td>
</tr>
<tr>
<td><strong>Explanation:</strong> These resources are estimates of College of Mathematics and Science course fee revenue. The additional course fee revenue collected by other colleges and by the university is not included in this calculation.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Existing State Resources</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Explanation:</strong> Click here to enter text.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>State Resources Available through Internal Allocation and Reallocation</td>
<td>$25,790</td>
<td>$51,580</td>
<td>$77,370</td>
<td>$103,160</td>
<td>$128,950</td>
</tr>
<tr>
<td><strong>Explanation:</strong> This is computed from the estimated student FTE in Computer Engineering times the most recent (2017-18) institutional funding per student FTE available ($3,345/FTE).</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student Tuition</td>
<td>$44,072</td>
<td>$74,688</td>
<td>$112,032</td>
<td>$149,376</td>
<td>$186,720</td>
</tr>
<tr>
<td><strong>Explanation and Calculations (Note: Tuition calculation should be based on the estimated student demanded indicated in section V “Demand for the Program” of this form):</strong> (est tot enrollment)(70% resident/12 credit hours/student)(resident tuition&amp;fees/credit hour)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>$74,376</td>
<td>$135,295</td>
<td>$202,943</td>
<td>$270,590</td>
<td>$338,238</td>
</tr>
</tbody>
</table>
## B. Breakdown of Budget Expenses/Requirements

<table>
<thead>
<tr>
<th>Year of Program</th>
<th>1st Year</th>
<th>2nd Year</th>
<th>3rd Year</th>
<th>4th Year</th>
<th>5th Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrative/Other Professional Staff</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Explanation:</strong> While administrative staff from the Departments of Engineering &amp; Physics and Computer Science will devote a portion of their time to support the students anticipated to enroll in this program, no additional staff or professional positions will be required.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Faculty</td>
<td>$9,000</td>
<td>$9,000</td>
<td>$9,000</td>
<td>$9,000</td>
<td>$9,000</td>
</tr>
<tr>
<td><strong>Explanation:</strong> Three additional courses are being developed to support this program, a Control Systems sequence being developed in conjunction with an industry partner, and the Electrical Engineering program. Courses that are reassigned for faculty to teach these courses will be taught by adjunct faculty or adjunct faculty from industry partners may be assigned to teach these courses.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Graduate Assistants</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Explanation:</strong> There is no graduate major with this program.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student Employees</td>
<td>$2,880</td>
<td>$2,880</td>
<td>$2,880</td>
<td>$2,880</td>
<td>$2,880</td>
</tr>
<tr>
<td><strong>Explanation:</strong> This is an estimate of the student TA wages that will be budgeted to support the new courses supporting this program.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equipment and Instructional Materials</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Explanation:</strong> No additional equipment will be required beyond that already budgeted to support the BS in Electrical Engineering and the BS in Computer Science.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Library</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Explanation:</strong> No additional library funds are currently anticipated.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contractual Services</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Explanation:</strong> No additional contractual services are currently anticipated.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Support Services</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Explanation:</strong> No additional support services are currently anticipated.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commodities</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Explanation:</strong> NA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Printing</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Explanation:</strong> Printing for brochures and other promotional materials will be handled out of current E&amp;G budget.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telecommunications</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Explanation:</strong> No additional telecommunication needs are currently anticipated.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Travel</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Explanation:</strong> Full-time faculty will continue to use current allocations for travel to professional meetings.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Awards and Grants</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Explanation:</strong> NA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>$11,880</td>
<td>$11,880</td>
<td>$11,880</td>
<td>$11,880</td>
<td>$11,880</td>
</tr>
</tbody>
</table>

## I. 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. Plans to

[http://www.okhighered.org/admin-fac/academic-forms.shtml](http://www.okhighered.org/admin-fac/academic-forms.shtml)
implement program review and program outcomes-level student assessment requirements as established by State Regents’ policies should be detailed. 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.

Program Review

At UCO, programs that can be externally accredited are allowed to use that specialized accreditation as their program review provided that the self-study process is sufficiently robust and that approval has been given by Academic Affairs. UCO Engineering programs are already accredited under the Engineering Accreditation Commission (EAC) of ABET (the agency which manages specialized accreditation in engineering). We will use this same accreditation process as the major shifts into the new Computer Engineering program. Details of this process are available at [http://www.abet.org/accreditation/](http://www.abet.org/accreditation/).

The ABET review cycle occurs every six years. UCO’s current engineering programs are scheduled for their next ABET review during the 2025/2026 academic year. An outline of the accreditation process is found below with details available at: [https://www.abet.org/accreditation/get-accredited/accreditation-step-by-step/](https://www.abet.org/accreditation/get-accredited/accreditation-step-by-step/)

1. For new ABET program accreditations, a Readiness Review would be completed and submitted by Nov 1, 2024. This review is designed specifically for new programs to ensure that the program is sufficiently prepared for the self-study and site visit process. Current programs are not required to submit a readiness review since accreditation and assessment processes are already in place.
2. A request for evaluation to ABET will be submitted by Jan 31, 2025.
3. A program Self-Study Report will be prepared and submitted by Jul 1, 2025. This is the primary document that demonstrates compliance with ABET criteria and policies. The department will begin working on this document in summer 2024.
4. ABET will send an on-site peer review team over a period of three days in fall 2025. This team will verify information in the Self-Study Report through interviews with faculty, students, administrators, and staff. The team will also review student transcripts, examples of student work, syllabi, assessment results, facilities, and other supporting evidence. Because this is centered on the peer review process, ABET reviewers will also share best practices and suggestions for improvements, as well as assist in identifying and resolving problems. The team will conduct an exit interview at the end of the visit.
5. Prior to the final accreditation decision in July 2026, the institution is given a draft statement of the site visit team’s findings along with a chance to resolve any critical issues.
6. The department faculty will meet with the Associate Vice President for Institutional Effectiveness and the Provost to review the findings.

Assessment Process (Continuous Improvement Process)

This program, like all university academic programs, will be reviewed annually under UCO’s assessment process. The Computer Engineering program will assess the following student learning outcomes (SLOs),

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

[http://www.okshighered.org/admin-fac/academic-forms.shtml](http://www.okshighered.org/admin-fac/academic-forms.shtml)
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Each of these outcomes is reviewed through multiple course-level assignments at both the formative and summative levels over a 2-year cycle. Assessment results are collected and organized through an on-line database. Results are reviewed annually by department faculty in an assessment review meeting. Zero cost and resource dependent solutions are identified for implementation or inclusion in the department's annual planning request. Results of implemented solutions are assessed in the next assessment cycle.

*Evaluation of Faculty*

Faculty are evaluated through a process outlined in the UCO Faculty Handbook. This process includes an evaluation by peers, by the department chair, and by the dean. The frequency of evaluation depends on whether the faculty member is non-tenured, part time, tenure-track, or tenured.

Students evaluate each faculty member in each course taught using the Student Perception of Instructional Effectiveness (SPIE) instrument. These are administered in fall, spring, and summer semesters, unless enrollment is too low to preserve student anonymity. Students provide a numerical evaluation of the course and instructor, as well as open ended comments. These evaluations are included in the faculty review process described above.

*Other documents required for dual or joint degree requests*

If requesting a dual or joint degree, attach the New Joint or Dual Program Request cover page.
Appendix – Faculty

The Department of Engineering and Physics and the Department of Computer Science encompass several engineering disciplines: mechanical engineering, electrical engineering, engineering physics, biomedical engineering, and software engineering, as well as computer science. This unique mixture of disciplines has fostered strong interdisciplinary faculty collaboration that is mirrored in the department’s undergraduate and graduate students. Faculty members from both departments tend to work in multiple curricular, research, and service areas. Depending on training, previous coursework, and research interests, faculty members regularly contribute to curricular and research activities in multiple disciplines.

The majority of courses for the proposed program are already in place and have been routinely taught at UCO. New courses supporting this program are being added to also support other engineering programs or are zero cost (see section B). No additional full-time faculty members are required to support this program. Additional adjuncts may be necessary to support three of the proposed new courses, but these will be covered by the tuition of the students enrolling in these courses.

Additional faculty may be needed as a result of continued program growth. This will be evident through the additional sections that would need to be added to support the new student growth and a portion of their tuition revenue could then be used to support the additional faculty requirements. Alternatively, program growth could be capped to accommodate existing resources.

Below are summaries of educational background and experiences for the primary and secondary support faculty for this program.

**Primary tenure/tenure track faculty supporting this program:**
These faculty will provide the greatest contribution to this program in the form of classroom instruction, sponsorship of undergraduate research, advising, mentoring student professional groups, etc.

1. Name: Nesreen Alsbow

2. Education – degree, discipline, institution, year:

<table>
<thead>
<tr>
<th>Degree</th>
<th>Discipline</th>
<th>Institution</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.S.</td>
<td>Computer Engineering</td>
<td>Kansas State University</td>
<td>2000</td>
</tr>
<tr>
<td>M.S.</td>
<td>Electrical Engineering</td>
<td>Kansas State University</td>
<td>2002</td>
</tr>
<tr>
<td>Ph.D.</td>
<td>Electrical and Computer Engineering</td>
<td>University of Oklahoma</td>
<td>2012</td>
</tr>
</tbody>
</table>

3. Academic experience – institution, rank, title (chair, coordinator, etc. if appropriate), when (ex. 1990-1995), full time or part time:

<table>
<thead>
<tr>
<th>Institution</th>
<th>Rank</th>
<th>Title</th>
<th>Dates Held</th>
<th>FT/PT</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Central Oklahoma</td>
<td>Assistant Professor</td>
<td>2017 - Present</td>
<td>FT</td>
<td></td>
</tr>
<tr>
<td>University of Central Oklahoma</td>
<td>Visiting Professor</td>
<td>2016-2017</td>
<td>FT</td>
<td></td>
</tr>
<tr>
<td>University of Central Oklahoma</td>
<td>Lecturer</td>
<td>2015-2016</td>
<td>FT</td>
<td></td>
</tr>
<tr>
<td>Ohio Northern University</td>
<td>Assistant Professor</td>
<td>2014-2015</td>
<td>FT</td>
<td></td>
</tr>
<tr>
<td>Ohio Northern University</td>
<td>Visiting Professor</td>
<td>2013-2014</td>
<td>FT</td>
<td></td>
</tr>
<tr>
<td>Pennsylvania State University-Erie</td>
<td>Visiting Professor</td>
<td>2012-2013</td>
<td>FT</td>
<td></td>
</tr>
<tr>
<td>University of Oklahoma</td>
<td>Graduate TA/RA</td>
<td>2008-2012</td>
<td>PT</td>
<td></td>
</tr>
<tr>
<td>New York University</td>
<td>Graduate TA/RA</td>
<td>2006-2008</td>
<td>PT</td>
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</tr>
<tr>
<td>Virginia Commonwealth</td>
<td>Graduate TA/RA</td>
<td>2004-2005</td>
<td>PT</td>
<td></td>
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http://www.okhighered.org/admin-fac/academic-forms.shtml
4. Non-academic experience – company or entity, title, brief description of position, when (ex. 1993-1999), full time or part time:
None

5. Certifications or professional registrations: None

6. Membership in professional organizations:
   - Institute of Electrical and Electronics Engineers (IEEE)
   - Member in the American Society of Engineering Education (ASEE)
   - Women in Engineering (WIE)
   - Society of Women Engineers (SWE)
   - Oklahoma Academy of Science (OAS)

7. Honors and Awards:
   - University of Central Oklahoma CURE-STEM Faculty Scholarship (2017)
   - University of Oklahoma, ECE Travel Award to GlobeCom2010 in Miami, Florida.
   - NYU-Polytechnic, ECE Travel Award NanoArch2006 in Boston, Massachusetts.
   - Graduate Research Assistantship, OU (08/2008-01/2012).

8. Service activities (within and outside of the institution):
   - Electrical Engineering Program Coordinator – Department of Engineering and Physics (2018-present)
   - Director, UCO Internet of Things Laboratory – Department of Engineering and Physics (2018-present)
   - 2018-2019 UCO Transformative Learning Conference (TLC) Committee
   - 2017-2019 UCO SoTL Committee
   - 2018 UCO CMS Summer Bridge Program (July 9th-July 27th)
   - 2017 and 2018 UCO CMS Gear up Summer Program
   - 2017 UCO CMS Fulbright Scholar Advisor for an Iraqi Fulbright Scholar.
   - 2015-2019 Vice chair/Chair of the Engineering Sciences section of the OAS
   - 2018-2019 Society of Women Engineers (SWE) Faculty Advisor
   - 2017-2018 National Society of Black Engineers (NSBE) Faculty Advisor
   - UCO Summer Engineering and Physics Program (Summer Academy)

9. Briefly list the most important publications and presentations from the past five years – title, co-authors if any, where published and/or presented, date of publication or presentation:
   - **Nesreen Alshbou, Mohamed Abdul Samad, Mohamed Alhashem, Alaedin Abaahed “Developing a Self-Powered Enlarging Smart Waste Bin”.** 2018 IEEE International Wireless Communications & Mobile Computing Conference. IEEE IWCMC-SmartCity 2018

http://www.ekhsiteped.org/admin_fac/academics-forms.shtml
• Nesreen Alshbou, Salahuddin Ahmad, Imad Ali, “A motion algorithm to extract physical and motion parameters of mobile targets from cone-beam computed tomographic images” Journal of X-Ray Science and Technology, 2016

• Imad Ali, Nesreen Alshbou, Stephen Oyewale, Justin Jaskowiak, Salahuddin Ahmad, Ozer Algan, “Evaluation of localization uncertainty of fiducial markers due to length and position variations induced by motion in CT imaging by measurement and modeling” Gulf Journal of Oncology, 2016.


10. Briefly list the most recent professional development activities:
• Nesreen Alshbou (PI), “Development of Smart Mobile Thorax Phantom with a Flexible Wireless Motion Sensor Network”. UCO Faculty on Campus Interdisciplinary Grant.
• Nesreen Alshbou (PI), “Phantom Design for Correction of Motion Artifacts in CT Images of Cancer patients”. Ok-INBRE Carryover Fund.
• Nesreen Alshbou (Co-PI), “Acquisition of a portable hand-held radiography system for biomedical research and education”, 2018 Ok-INBRE Equipment Grant.

1. Name: Thomas R. Turner

2. Education – degree, discipline, institution, year:

<table>
<thead>
<tr>
<th>Degree</th>
<th>Discipline</th>
<th>Institution</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ph.D.</td>
<td>Computer Engineering</td>
<td>Iowa State University</td>
<td>1987</td>
</tr>
<tr>
<td>M.S.</td>
<td>Electrical Engineering</td>
<td>Iowa State University</td>
<td>1981</td>
</tr>
<tr>
<td>B.S.</td>
<td>Mathematics</td>
<td>University of Washington</td>
<td>1975</td>
</tr>
</tbody>
</table>

3. Academic experience – institution, rank, title (chair, coordinator, etc. if appropriate), when (ex. 1990-1995), full time or part time:

- 8-93 to Present University of Central Oklahoma, Edmond, Oklahoma
  Professor Full Time
- 6/89 – 6/90 Winona State University
  Adjunct Professor Part Time

4. Non-academic experience – company or entity, title, brief description of position, when (ex. 1993-1999), full time or part time:

- 2/13 to 8/13 Dawson Geophysical Company, Oklahoma City, Oklahoma
  Consultant Part Time
  Designed and implemented Windows Programs that depict seismic recordings

- 8/84 to 8/93 IBM Corporation, Rochester, Minnesota
  Staff Programmer Full Time
  Project leader and lead technical designer for the AS/400 Source Debugger

- 9/81 to 7/84 Iowa State University, Ames, Iowa
  Graduate Assistant Part Time
  Lectured for Introduction to Digital Techniques, Introduction to Digital Circuits and Systems, and Digital Laboratory I

- 4/78 to 8/81 Rockwell International Corporation, Collins Avionics Divisions, Cedar Rapids, Iowa
  Engineer/Scientist Full Time

http://www.okhighered.org/admin-fao/academic-forms.shtml
Project Leader for the Collins Adaptive Processing System (CAPS)
Symbolic Debugger

1/76 to 4/78  
**The Boeing Aerospace Company, Seattle, Washington**
Software Engineer  
Full Time
Designed computer programs which displayed tabular information on board
Airborne Warning and Control System (AWACS - E3A) aircraft

5. Certifications or professional registrations: None

6. Current membership in professional organizations: Member ACM

7. Honors and awards:

<table>
<thead>
<tr>
<th>Date</th>
<th>Award</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>President's Partners in Teaching Excellence Award</td>
</tr>
<tr>
<td>1983</td>
<td>American Electronics Association Fellow</td>
</tr>
<tr>
<td>1982</td>
<td>Eta Kappa Nu (E. E. Honor Society)</td>
</tr>
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</table>

8. Service activities (within and outside of the institution):

<table>
<thead>
<tr>
<th>Organization</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABET</td>
<td>CAC Commissioner</td>
</tr>
<tr>
<td>UCO</td>
<td>Department Assessment Coordinator</td>
</tr>
</tbody>
</table>

9. Briefly list the most important publications and presentations from the past five years – title, co-authors if any, where published and/or presented, date of publication or presentation:

<table>
<thead>
<tr>
<th>Date</th>
<th>Citation</th>
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<tbody>
<tr>
<td>2015</td>
<td>Hogue, D.; Klundt, G.; Mclain, W.; Sefcik, N.; and Turner, T. <em>Creating a Pascal Compiler</em> Research Day Poster</td>
</tr>
<tr>
<td>2014</td>
<td>Fu, Gourley, Park, Qian, Sung, Thomas Turner <em>Obtaining and Maintaining ABET Accreditation: An Experience-Based Review of the ABET Criteria for Computer Science Programs</em>; Journal of Computing Sciences in Colleges; Volume 29, Number 4, April 2014</td>
</tr>
</tbody>
</table>

10. Briefly list the most recent professional development activities:

<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>Ng, Vincent; <em>Uphill Battles in Natural Language Processing</em> University of Central Oklahoma 2019 Spring Seminar Series</td>
</tr>
</tbody>
</table>

1. Name: Hong K. Sung

2. Education – degree, discipline, institution, year:

http://www.okhighered.org/admin-fac/academic-forms.shtml
3. Academic experience – institution, rank, title (chair, coordinator, etc. if appropriate), when (ex. 1990-1995), full time or part time:

<table>
<thead>
<tr>
<th>Year</th>
<th>Institution</th>
<th>Position</th>
<th>Full Time</th>
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</thead>
<tbody>
<tr>
<td>2000 to Present</td>
<td>University of Central Oklahoma, Edmond, Oklahoma</td>
<td>Professor</td>
<td></td>
</tr>
<tr>
<td>1999-2000</td>
<td>Southwestern Oklahoma State University, Weatherford, Oklahoma</td>
<td>Assistant Professor</td>
<td></td>
</tr>
<tr>
<td>1995-1997</td>
<td>Hallym University, Choochun, South Korea</td>
<td>Lecturer</td>
<td></td>
</tr>
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4. Non-academic experience – company or entity, title, brief description of position, when (ex. 1993-1999), full time or part time

<table>
<thead>
<tr>
<th>Year</th>
<th>Company/Entity</th>
<th>Position</th>
<th>Full Time</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1984-1989</td>
<td>E.T.R.I., Daejon, South Korea</td>
<td>Member of Technical Staff</td>
<td>Full Time</td>
<td>Designed embedded systems.</td>
</tr>
</tbody>
</table>

5. Certifications or professional registrations: None

6. Current membership in professional organizations: ACM

7. Honors and awards:
   - Faculty Merit Award – Teaching Category, UCO, 2013

8. Service activities (within and outside of the institution)
   - Organization: UCO
     - Activity: Assistant Chairperson

9. Briefly list the most important publications and presentations from the past five years – title, co-authors if any, where published and/or presented, date of publication or presentation:

<table>
<thead>
<tr>
<th>Date</th>
<th>Citation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>Callie Driver, “Pyramid Fighter”, faculty sponsor of the student poster presented at National Conference on Undergraduate Research, Edmond, Oklahoma, 2018</td>
</tr>
<tr>
<td>2018</td>
<td>Daniel Williams, “UCO Augmented Tourism”, faculty sponsor of the student poster presented at National Conference on Undergraduate Research, Edmond, Oklahoma, 2018</td>
</tr>
<tr>
<td>2018</td>
<td>Todd Bradshaw, “Citylink Transit: An Android Mobile App for Citylink Transit System”, faculty sponsor of the student poster presented at National Conference on Undergraduate Research, Edmond, Oklahoma, 2018</td>
</tr>
<tr>
<td>2018</td>
<td>Abigail Kern, &quot;Implementing Software Design Patterns to Create an Arcade Level Space Shooter Game&quot;, faculty sponsor of the student poster presented at the Oklahoma Research Day, 2018</td>
</tr>
<tr>
<td>2018</td>
<td>Gregory Levy, &quot;Using Design Patterns to Create Interchangeable Behaviors &quot;, faculty sponsor of the student poster presented at the Oklahoma Research Day, 2018</td>
</tr>
<tr>
<td>2018</td>
<td>Patrick Panizek, &quot;3D Platformer&quot;, faculty sponsor of student poster presented at the Oklahoma Research Day, 2018</td>
</tr>
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</table>
   | 2017 | Hong Sung, “Project management using Scrum agile method in the capstone class of the computer science and software engineering students”, a poster presented at the 28th Annual South Central
Regional Conference hosted by the Consortium for Computing Sciences in Colleges, Pt. Worth, Texas, 2017
2017 Daniel Williams, (faculty advisor - Hong Sung), "UCO Augmented Tourism: Using Augmented Reality to Navigate the UCO Campus", Poster presented at the 28th Annual South Central Regional Conference hosted by the Consortium for Computing Sciences in Colleges, Pt. Worth, Texas, 2017. (The third place award at student poster competition)
2017 Adam Bilby, Haseeb Amin, Garrett Clement, Nicholas Clemmons, (faculty advisor - Hong Sung), "RetroCollect: Leveraging a Database and APIs to Develop A More Robust Application", Poster presented at Oklahoma Research Day, 2017

10. Briefly list the most recent professional development activities:

<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>Studied Firebase cloud services for web and mobile applications</td>
</tr>
<tr>
<td>2018</td>
<td>Studied KOTLIN and Android app development</td>
</tr>
<tr>
<td>2017</td>
<td>Studied NodeJS web development</td>
</tr>
</tbody>
</table>

1. Name: Alaeddin Abuabed

2. Education – degree, discipline, institution, year:

<table>
<thead>
<tr>
<th>Degree</th>
<th>Discipline</th>
<th>Institution</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.S.</td>
<td>Electrical Engineer</td>
<td>Jordan University of Science and Technology</td>
<td>1999</td>
</tr>
<tr>
<td>Ph.D.</td>
<td>Electrical Engineer</td>
<td>Jordan University of Science and Technology</td>
<td>2001</td>
</tr>
<tr>
<td>Ph.D.</td>
<td>Electrical Engineer</td>
<td>University of Alabama in Huntsville</td>
<td>2007</td>
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</table>

3. Academic experience – institution, rank, title (chair, coordinator, etc. if appropriate), when (ex. 1990-1995), full time or part time:

<table>
<thead>
<tr>
<th>Institution</th>
<th>Rank</th>
<th>Title</th>
<th>Dates Held</th>
<th>FT/PT</th>
</tr>
</thead>
<tbody>
<tr>
<td>UCO</td>
<td>Professor</td>
<td></td>
<td>2018-present</td>
<td>FT</td>
</tr>
<tr>
<td>UCO</td>
<td>Associate Professor</td>
<td></td>
<td>2013-2018</td>
<td>FT</td>
</tr>
<tr>
<td>UCO</td>
<td>Assistant Professor</td>
<td></td>
<td>2008-2013</td>
<td>FT</td>
</tr>
<tr>
<td>University of Alabama - Huntsville</td>
<td>Visiting Assistant</td>
<td></td>
<td>2007-2008</td>
<td>FT</td>
</tr>
<tr>
<td>University of Alabama - Huntsville</td>
<td>Professor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>University of Alabama - Huntsville</td>
<td>Graduate TA/RA</td>
<td></td>
<td>2003-2007</td>
<td>PT</td>
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4. Non-academic experience – company or entity, title, brief description of position, when (ex. 1993-1999), full time or part time:

<table>
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<tr>
<th>Organization</th>
<th>Title</th>
<th>Duties</th>
<th>Dates</th>
<th>FT/PT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ericsson KSA</td>
<td>Trainer</td>
<td></td>
<td>2002-2003</td>
<td>PT</td>
</tr>
</tbody>
</table>

5. Certifications or professional registrations: None

6. Current membership in professional organizations:

http://www.okhighered.org/admin-fac/academic-forms.shtml
Senior Member: Institute of Electrical and Electronics Engineers (IEEE)
Oklahoma Academy of Science (OAS)

7. Honors and Awards:
• Mevlana professors exchange program award in Uludağ University, Turkey (2017)
• The Neely excellence in teaching award, UCO (2015)
• Faculty merit Award in the area of Service, UCO (2013)
• Vanderford distinguished teacher award, UCO (2010)
• Best Student Paper Award, IEEE Sensors Applications Symposium, CA (2007)
• IEEE Instrumentation and Measurement Society Student Ambassador (2007)

8. Service Activities:
• Assistant Chair – Department of Engineering and Physics (2018-present)
• ABET Coordinator – Department of Engineering and Physics (2018-present)
• Faculty advisor of UCO IEEE student chapter (2011-present)
• Department and college Tenure and promotion committee (2016 – present)
• UCO graduate council, (2012-2015)
• College representative in the academic affairs curriculum council (2015 – present)
• Engineering and Physics graduate program committee (2010-present)

9. Briefly list the most important publications and presentations from the past five years – title, co-authors if any, where published and/or presented, date of publication or presentation:
• J. Roberts and A. Abuaib, “Software Enabled Pseudo-Random Pattern Generator,” *IEEE-I2MTC*, Houston, TX, USA, May 2018
• Afify, A. Abuaib, and N. Alsou “Smart Engine Speed Control System with ECU System Interface,” *IEEE-I2MTC*, Houston, TX, USA, May 2018.

10. Briefly list the most recent professional development activities:
• A. Abuaib (PI), “Enhanced electrosynp nano fiber system to improve the biological and mechanical performance of composite multilayer scaffolds,” UCO Interdisciplinary grant, 2017.
• A. Abuaib (PI), “Development of an innovative smart system to produce 3D electrosynp fiber-hydrogel scaffold for biomedical applications,” *NIH-INBRE-OK*, 2016.
1. Name: Mohamed Bingabr

2. Education – degree, discipline, institution, year:

<table>
<thead>
<tr>
<th>Degree</th>
<th>Discipline</th>
<th>Institution</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.S.</td>
<td>Biomedical Engineering</td>
<td>Syracuse University</td>
<td>1989</td>
</tr>
<tr>
<td>MS</td>
<td>Electrical Engineering</td>
<td>Syracuse University</td>
<td>1993</td>
</tr>
<tr>
<td>Ph.D.</td>
<td>Electrical Engineering</td>
<td>Syracuse University</td>
<td>2002</td>
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3. Academic experience – institution, rank, title (chair, coordinator, etc. if appropriate), when (ex. 1990-1995), full time or part time:

<table>
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<tr>
<th>Institution</th>
<th>Rank</th>
<th>Title</th>
<th>Dates Held</th>
<th>FT/PT</th>
</tr>
</thead>
<tbody>
<tr>
<td>UCO</td>
<td>Professor</td>
<td></td>
<td>2014-present</td>
<td>FT</td>
</tr>
<tr>
<td>UCO</td>
<td>Associate</td>
<td></td>
<td>2009-2014</td>
<td>FT</td>
</tr>
<tr>
<td>UCO</td>
<td>Professor</td>
<td></td>
<td>2004-2009</td>
<td>FT</td>
</tr>
<tr>
<td>Wells College, NY</td>
<td>Assistant</td>
<td>Visitor</td>
<td>2002-2004</td>
<td>FT</td>
</tr>
<tr>
<td>Sanaa University</td>
<td>Lecturer</td>
<td></td>
<td>1993 - 1997</td>
<td>FT</td>
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</table>

4. Non-academic experience – company or entity, title, brief description of position, when (ex. 1993-1999), full time or part time:

<table>
<thead>
<tr>
<th>Organization</th>
<th>Title</th>
<th>Duties</th>
<th>Dates</th>
<th>FT/PT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Univ. Hospital</td>
<td>Engineer</td>
<td></td>
<td>1989-1991</td>
<td>FT</td>
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</table>

5. Certifications or professional registrations: None

6. Membership in professional organizations:
- Senior Member: Institute of Electrical and Electronics Engineers (IEEE)
- Senior Member: Biomedical Engineering Society (BMES)
- Oklahoma Academy of Science (OAS)

7. Honors and Awards:
- The Neely excellence in teaching award, UCO (2013)
- Faculty merit Award in the area of Teaching, UCO (2012)

8. Service activities (within and outside of the institution):
- Chair – Department of Engineering and Physics (2014-2018)
- Completed the ELA Educational Administrators’ Academy Program (2015-2016)
- Completed the Academic Leadership Fellows Academy program (2016-2017)
- UCO Senate, (2010-2012)
- College and University curriculum committee (2009 – 2011)
- Biomedical Engineering Program Coordinator (2006-2008)

9. Briefly list the most important publications and presentations from the past five years – title, co-authors if any, where published and/or presented, date of publication or presentation:

http://www.okhighered.org/admin-site/academic-forms.shtml


10. Briefly list the most recent professional development activities:
   2013 NIH IDEa Network of Biomedical Research Excellence (INBRE) $37,000
   2012 OSRHE External grant $17,626

1. Name: Jicheng Fu

2. Education – degree, discipline, institution, year:

<table>
<thead>
<tr>
<th>Degree</th>
<th>Discipline</th>
<th>Institution</th>
<th>Year</th>
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</thead>
<tbody>
<tr>
<td>Ph.D.</td>
<td>Computer Science</td>
<td>The University of Texas at Dallas</td>
<td>2009</td>
</tr>
<tr>
<td>M.S.</td>
<td>Computer Science</td>
<td>The University of Texas at Dallas</td>
<td>2007</td>
</tr>
<tr>
<td>M.S.</td>
<td>Computer Science</td>
<td>Harbin Institute of Technology</td>
<td>1998</td>
</tr>
<tr>
<td>B.S.</td>
<td>Computer Science</td>
<td>Harbin Institute of Technology</td>
<td>1996</td>
</tr>
</tbody>
</table>

3. Academic experience – institution, rank, title (chair, coordinator, etc. if appropriate), when (ex. 1990-1995), full time or part time:

   2014 to Current University of Central Oklahoma, Edmond, Oklahoma Associate Professor Full Time

   2009 to 2014 University of Central Oklahoma, Edmond, Oklahoma Assistant Professor Full Time

   2004-2009 The University of Texas at Dallas, Richardson, Texas Teaching/Research Assistant Part Time

4. Non-academic experience – company or entity, title, brief description of position, when (ex. 1993-1999), full time or part time:

   2002-2004 Achievo Inc., Beijing, China Project/Engineering Manager Full Time
   Software design, development, and project management

   2001-2002 SDL International, Beijing, China Senior Software Engineer Full Time
   Software design, development, and maintenance

   1998-2001 China National Software and Service Co., Ltd. (CS&S) Software Engineer Full Time
   Software design and development

5. Certifications or professional registrations: None

6. Membership in professional organizations:
   • Member of Institute of Electrical and Electronics Engineers (IEEE)
   • Member of Association for Computing Machinery (ACM)

http://www.okhighered.org/admin-facacademic-forms.html
• Member of IBM Academic Initiatives

7. Honors and Awards:
- Faculty Merit Credit Research Award, 2018
- Vanderbilt Distinguished Teacher Award, 2018
- Faculty Merit Credit Research Award, 2016
- Sigma Xi Researcher of Year, 2014
- Faculty Merit Credit Research Award, 2014
- Faculty Merit Pay Research Award, 2012
- Junior Scholar Award, National Institutes of Health through Oklahoma IDeA Network of Biomedical Research Excellence (INBRE), 2011 – 2014, Total: $308,000

8. Service activities (within and outside of the institution):

<table>
<thead>
<tr>
<th>Organization</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Advisory Council (RAC), UCO</td>
<td>Member</td>
</tr>
<tr>
<td>Technology Advisory Council (TAC), UCO</td>
<td>Member</td>
</tr>
<tr>
<td>STEM PhD Exploratory Committee, CMS, UCO</td>
<td>Member</td>
</tr>
<tr>
<td>Center for Interdisciplinary Biomedical Education and Research (CIBER)</td>
<td>Member</td>
</tr>
<tr>
<td>Center for Research and Education in Interdisciplinary Computation (CREIC)</td>
<td>Member</td>
</tr>
</tbody>
</table>

9. Briefly list the most important publications and presentations from the past five years – title, co-authors if any, where published and/or presented, date of publication or presentation:

**Patents**


**Date** | **Citation**
--- | ---

10. Briefly list the most recent professional development activities:

<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015-Current</td>
<td>Program Committee Member for International Conference on Model-Driven Engineering and Software Development - MODELSWARD 2015</td>
</tr>
</tbody>
</table>

[http://www.ohlighered.org/admin-fac/academic-forms.shtml](http://www.ohlighered.org/admin-fac/academic-forms.shtml)
2015-Current  Program Committee Member for DEPEND 2015 - The Eighth International Conference on Dependability
2014-Current  Program Committee Member for the IEEE International Symposium on High Assurance Systems Engineering (HASE)
2014       Program Committee Member for the Ninth International Conference on Software Engineering Advances, 2014
2013-Current  Program Committee Member for International Conference on Software Engineering Advances (ICSEA)
2012       34th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, San Diego, CA
2012       NIH Regional Seminar, Washington DC
2012       iPad Academy Workshop, Edmond, Oklahoma
2011       IEEE International Conference on Semantic Computing (ICSC2011), Stanford University, CA, USA, 2011

1. Name: Yuhao Jiang

2. Education – degree, discipline, institution, year:

<table>
<thead>
<tr>
<th>Degree</th>
<th>Discipline</th>
<th>Institution</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.S.</td>
<td>Electrical Engineering</td>
<td>Nanjing University of Aeronautics and Astronautics</td>
<td>1993</td>
</tr>
<tr>
<td>M.S.</td>
<td>Electrical Engineering</td>
<td>Shanghai Jiaotong University</td>
<td>2000</td>
</tr>
<tr>
<td>Ph.D.</td>
<td>Biomedical Engineering</td>
<td>Case Western Reserve University</td>
<td>2006</td>
</tr>
</tbody>
</table>

3. Academic experience – institution, rank, title (chair, coordinator, etc. if appropriate), when (ex. 1990-1995), full time or part time:

<table>
<thead>
<tr>
<th>Institution</th>
<th>Rank</th>
<th>Title</th>
<th>Dates Held</th>
<th>FT/PT</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Central Oklahoma</td>
<td>Professor</td>
<td></td>
<td>2015- present</td>
<td>FT</td>
</tr>
<tr>
<td>University of Central Oklahoma</td>
<td>Associate Professor</td>
<td></td>
<td>2011-present</td>
<td>FT</td>
</tr>
<tr>
<td>University of Central Oklahoma</td>
<td>Assistant Professor</td>
<td></td>
<td>2006-2011</td>
<td>FT</td>
</tr>
<tr>
<td>Case Western Reserve University</td>
<td>Research and Teaching Assistant</td>
<td></td>
<td>2000-2006</td>
<td>PT</td>
</tr>
<tr>
<td>Shanghai Jiaotong U.</td>
<td>Research Assistant</td>
<td></td>
<td>1997-2000</td>
<td>PT</td>
</tr>
</tbody>
</table>

4. Non-academic experience – company or entity, title, brief description of position, when (ex. 1993-1999), full time or part time:

<table>
<thead>
<tr>
<th>Organization</th>
<th>Title</th>
<th>Duties</th>
<th>Dates</th>
<th>FT/PT</th>
</tr>
</thead>
<tbody>
<tr>
<td>China Aeronautical Radio and Electronics Research Institute</td>
<td>Development Engineer</td>
<td>Development</td>
<td>1993-1997</td>
<td>FT</td>
</tr>
</tbody>
</table>

5. Certifications or professional registrations: None

6. Membership in professional organizations:
   - Member: Institute of Electrical and Electronics Engineers
   - Member: Sigma Xi
   - Member: American Society for Engineering Education

7. Honors and Awards:
   - NIH Scholarship to attend the 10th MIPS Conference in Durham, NC, 2003.
   - BMES Travel Award to attend the second joint meeting of IEEE-EMBS and BMES in Houston, TX, 2002.

8. Service activities (within and outside of the institution):

http://www.okhighmed.org/admin-fac/academic-forms.shtml
Faculty Senator, University of Central Oklahoma, 2015-2027
Member, College Center for Research and Education in Interdisciplinary Computation (CREIC) Advisory Committee, 2014-present
Member, College Center for Interdisciplinary Biomedical Education and Research (CIBER), 2014-present
Member, Department and College Curriculum Committee, University of Central Oklahoma, 2014-present.
Member, Department and College Tenure and Promotion Review Committee, University of Central Oklahoma, 2014-present.

9. Briefly list the most important publications and presentations from the past five years – title, co-authors if any, where published and/or presented, date of publication or presentation:

10. Briefly list the most recent professional development activities:

1. Name: John William McDaniel

2. Education – degree, discipline, institution, year:

<table>
<thead>
<tr>
<th>Degree</th>
<th>Discipline</th>
<th>Institution</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ph.D.</td>
<td>Computer Science Education</td>
<td>Kansas State University</td>
<td>1985</td>
</tr>
<tr>
<td>M.S.</td>
<td>Computer Science</td>
<td>Oklahoma State University</td>
<td>1975</td>
</tr>
</tbody>
</table>

3. Academic experience – institution, rank, title (chair, coordinator, etc. if appropriate), when (ex. 1990-1995), full time or part time:

- University of Central Oklahoma, Edmond, Oklahoma
  - 2005 to Present
  - Professor
  - Full Time

http://www.okhighered.org/admin-fac/academic-forms.shtml
<table>
<thead>
<tr>
<th>Year</th>
<th>Position</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001 to 2005</td>
<td>Chair</td>
<td>Full Time</td>
</tr>
<tr>
<td>1994 to 2001</td>
<td>Professor</td>
<td>Full Time</td>
</tr>
<tr>
<td>1990 to 1994</td>
<td>Associate Professor</td>
<td>Full Time</td>
</tr>
<tr>
<td>1985 to 1990</td>
<td>Assistant Professor</td>
<td>Full Time</td>
</tr>
<tr>
<td>1975 to 1978</td>
<td>Instructor</td>
<td>Full Time</td>
</tr>
</tbody>
</table>

4. Non-academic experience – company or entity, title, brief description of position, when (ex. 1993-1999), full time or part time: None

5. Certifications or professional registrations: None

6. Membership in professional organizations: Member ACM

7. Honors and Awards: None

8. Service activities (within and outside of the institution): Science Fair

9. Briefly list the most important publications and presentations from the past five years – title, co-authors if any, where published and/or presented, date of publication or presentation:
   - **Date**: 2014, **Citation**: Presented a poster titled "Using Multiple Keys and RSA to Open a Safe" at the 25th Annual CCSC South Central Conference held at St. Edward's University in Austin, Texas.

10. Briefly list the most recent professional development activities:
    - **Date**: 12 – 2016, **Activity**: Learned HP Printer Control Language (PCL) to control a new printer driver (that I wrote) for the printer in the computer lab.
    - **Date**: 11 – 2016, **Activity**: Attended a presentation by Wenliang (Kevin) Du from Syracuse University titled "SmartPhone Security: Attacks, Defenses and Education"
    - **Date**: 4 – 2014, **Activity**: CMS Seminar Series - "Science and Supercomputing" by Dr. Dirk Colby
    - **Date**: 3 – 2014, **Activity**: American Democracy Project - "The Shadow War" by Mark Mazetti

1. Name: **Myung Ah (Grace) Park**

2. Education – degree, discipline, institution, year:

<table>
<thead>
<tr>
<th>Degree</th>
<th>Discipline</th>
<th>Institution</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ph.D.</td>
<td>Computer Science</td>
<td>University of Texas at Dallas</td>
<td>2007</td>
</tr>
<tr>
<td>M.S.</td>
<td>Computer Science</td>
<td>University of Texas at Dallas</td>
<td>2007</td>
</tr>
<tr>
<td>M.S.</td>
<td>Mathematics</td>
<td>Chungnam National University</td>
<td>1992</td>
</tr>
<tr>
<td>B.S.</td>
<td>Mathematics</td>
<td>Chungnam National University</td>
<td>1990</td>
</tr>
</tbody>
</table>

3. Academic experience – institution, rank, title (chair, coordinator, etc. if appropriate), when (ex. 1990-1995), full time or part time:
   - **8/08 to Present**: University of Central Oklahoma, Edmond, Oklahoma, **Professor**, Full Time

http://www.okhighered.org/admin-fac/academic-forms.shtml
4. Non-academic experience – company or entity, title, brief description of position, when (ex. 1993-1999), full time or part time:

1993-2001  **Electronics and Telecommunications Research Institute, Taejon, Korea**
(Senior) Member of Technical Staff
Research and Development of Telecommunication Systems

5. Certifications or professional registrations:

2009 – 2013 SANS GIAC Certified Forensic Analyst

6. Membership in professional organizations:

2013 – Present The Open Web Application Security Project (OWASP)

7. Honors and Awards:

<table>
<thead>
<tr>
<th>Date</th>
<th>Award</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>Student paper award, Annual Consortium for Computer Sciences in Colleges South Central</td>
</tr>
<tr>
<td></td>
<td>Regional Conference, Austin, Texas, 2010</td>
</tr>
</tbody>
</table>

8. Service activities (within and outside of the institution):

2019 Volunteer Botball, K-6-12 Robotics Competition
2017 – Present Host Code Okie Workshops – High School Outreach
2018 – Present Member Oklahoma Aspiration in Computing Committee
2011 – Present Member Forensic Science Curriculum Committee Council
2013 – 2016 Member College Curriculum Committee
2013 – 2014 Member Information Security Policy Committee
2010 – Present Reviewer Conferences, such as

- Consortium for Computing Sciences in Colleges
- International Journal of Educational Development
- International Workshop on Sensor Networks
- International Conference on Software Engineering and Data

9. Briefly list the most important publications and presentations from the past five years – title, co-authors if any, where published and/or presented, date of publication or presentation:

<table>
<thead>
<tr>
<th>Date</th>
<th>Citation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>Sila Tamang, Miranda Babb, Kendall Babb, Rashed Alrashed, and Austin Cauley, &quot;Measured</td>
</tr>
<tr>
<td></td>
<td>effectiveness and Lesson Learned from Code Okie Outreach Workshop for High School Students&quot;,</td>
</tr>
<tr>
<td></td>
<td>faculty sponsor of the student poster presented at National Conference on Undergraduate</td>
</tr>
<tr>
<td></td>
<td>Research, Kennesaw, Georgia</td>
</tr>
<tr>
<td>2019</td>
<td>Kendall Babb, Sila Tamang, Miranda Babb, Rashed Alrashed, and Austin Cauley, &quot;A Second Look</td>
</tr>
<tr>
<td></td>
<td>at Computer Science Ambassadors' Transformation Through Code Okie Workshops&quot;</td>
</tr>
<tr>
<td></td>
<td>faculty sponsor of the student poster presented at Transformative Learning Conference 2019,</td>
</tr>
<tr>
<td></td>
<td>Oklahoma City, Oklahoma</td>
</tr>
<tr>
<td>2018</td>
<td>M. –A. Park and et al, The Impact of Code Okie: One Line At a Time! on a Team of Undergraduate</td>
</tr>
<tr>
<td></td>
<td>Student Teachers, Transformative Learning Conference, Oklahoma City, Oklahoma</td>
</tr>
<tr>
<td>2018</td>
<td>Sila Tamang and et al, &quot;Effectiveness of the Code Okie Workshop in Promoting Computer Science</td>
</tr>
<tr>
<td></td>
<td>Amongst High School Students in Oklahoma&quot;</td>
</tr>
<tr>
<td></td>
<td>faculty sponsor of the student poster presented at National Conference on Undergraduate</td>
</tr>
<tr>
<td></td>
<td>Research, Edmond, Oklahoma</td>
</tr>
<tr>
<td>2018</td>
<td>Austin Cauley and et al, &quot;A Journey of Computer Science Ambassadors to Transformation</td>
</tr>
<tr>
<td></td>
<td>Through Code Okie Workshops&quot;, faculty sponsor of the student poster presented at</td>
</tr>
<tr>
<td></td>
<td>Transformative Learning Conference, Oklahoma City, Oklahoma</td>
</tr>
<tr>
<td>2018</td>
<td>Sharon Too and Courtney Apple, &quot;The Equifax Security Breach: Can We Prevent History From</td>
</tr>
<tr>
<td></td>
<td>Repeating Itself?&quot;, faculty advisor of the student poster presented at CCSC2018, Texas</td>
</tr>
<tr>
<td></td>
<td>Christian University, Texas</td>
</tr>
</tbody>
</table>

http://www.okhighered.org/admin-fac/academic-forms.shtml
10. Briefly list the most recent professional development activities:

<table>
<thead>
<tr>
<th>Date</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>Attended Security Beyond Computer Science Workshop, University of Houston, TX</td>
</tr>
<tr>
<td>2018</td>
<td>Attended Wireless Network Security and Privacy Workshop, Texas Southern University, TX</td>
</tr>
<tr>
<td>2018</td>
<td>Attended Women in CyberSecurity, Chicago, IL</td>
</tr>
<tr>
<td>2017</td>
<td>Attended CyberSecurity Coalition meetings, Oklahoma City, OK</td>
</tr>
<tr>
<td>2016</td>
<td>Attended Faculty Book Clubs, UCO</td>
</tr>
<tr>
<td>2016</td>
<td>Attended Women in CyberSecurity, Tucson, AZ</td>
</tr>
<tr>
<td>2016</td>
<td>Attended Scratch@MIT conference, MIT, MA</td>
</tr>
<tr>
<td>2016</td>
<td>Attended Code.org regional workshop, University of Oklahoma, Norman, OK</td>
</tr>
<tr>
<td>2016</td>
<td>Attended 3rd CREST Workshop, Auburn University, AL</td>
</tr>
<tr>
<td>2016</td>
<td>Attended SEED workshop, Syracuse University, NY</td>
</tr>
<tr>
<td>2016</td>
<td>Attended Root 66 Information Security Conference, Cox Convention Center, OK</td>
</tr>
<tr>
<td>2015</td>
<td>Attended Cloud Security Curriculum Development Workshop, University of North Carolina, Chapel Hill, NC</td>
</tr>
<tr>
<td>2014</td>
<td>Attended &quot;Advanced Web Penetration Testing&quot; training session at AppSec USA, Denver, CO</td>
</tr>
<tr>
<td>2014</td>
<td>Attended Root 66 Information Security Conference, Cox Convention Center, OK</td>
</tr>
<tr>
<td>2013</td>
<td>Attended InnoTech &amp; Root-66 Conference, Cox Convention Center, OK</td>
</tr>
</tbody>
</table>

1. Name: Gang Qian

2. Education – degree, discipline, institution, year:

<table>
<thead>
<tr>
<th>Degree</th>
<th>Discipline</th>
<th>Institution</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ph.D.</td>
<td>Computer Science</td>
<td>Michigan State University</td>
<td>2004</td>
</tr>
<tr>
<td>M.S.</td>
<td>Computer Science</td>
<td>Shanghai Jiao Tong University</td>
<td>2000</td>
</tr>
<tr>
<td>B.S.</td>
<td>Computer Science</td>
<td>Shanghai Jiao Tong University</td>
<td>1995</td>
</tr>
</tbody>
</table>

3. Academic experience – institution, rank, title (chair, coordinator, etc. if appropriate), when (ex. 1990-1995), full time or part time:

- 2014 – present University of Central Oklahoma, Edmond, Oklahoma
  - Professor & Chairperson
  - Full Time

- 2009 – 13 University of Central Oklahoma, Edmond, Oklahoma
  - Associate Professor & Chairperson
  - Full Time

- 2004 – 09 University of Central Oklahoma, Edmond, Oklahoma
4. Non-academic experience – company or entity, title, brief description of position, when (ex. 1993-1999), full time or part time:

2000
HP Consulting, China Hewlett-Packard Co., Ltd.
Associate Technical Consultant
Full Time
Worked on system integration projects of CRM systems

1995 – 97
System Integration Division, Shanghai Venus Software Co., Ltd.
Software Engineer
Full Time
Worked on system integration projects of customized office information systems

5. Certifications or professional registrations: None

6. Current membership in professional organizations: Member of ACM

7. Honors and Awards:

<table>
<thead>
<tr>
<th>Date</th>
<th>Award</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>Student poster award (1st-place Non-life Science). The 22nd Annual OK-LSAMP Research Symposium, Stillwater, OK.</td>
</tr>
<tr>
<td>2010</td>
<td>Student poster award (2nd place) in the 21st Annual Consortium for Computer Sciences in Colleges South Central Regional Conference, Austin, Texas, 2010</td>
</tr>
<tr>
<td>2008</td>
<td>Best paper award in the 13th International Conference on Database Systems for Advanced Applications (DASFAA 2008), New Delhi, March 2008</td>
</tr>
<tr>
<td>2005</td>
<td>Best paper award in the 7th International Conference on Enterprise Information Systems (ICEIS 2005), Miami, Florida, May 2005</td>
</tr>
</tbody>
</table>

8. Service Activities:

<table>
<thead>
<tr>
<th>Organization</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>UCO</td>
<td>Department Chairperson (2009 – present)</td>
</tr>
<tr>
<td></td>
<td>Chair of Department Curriculum Committee</td>
</tr>
<tr>
<td></td>
<td>Member of other department committees</td>
</tr>
<tr>
<td>Journals</td>
<td>Referee for numerous journals and conferences, such as TOIS, TKDE, the Computer</td>
</tr>
<tr>
<td>conferences</td>
<td>Journal, IJCA, DEXA, WAIM, APWeb, etc.</td>
</tr>
</tbody>
</table>

9. Briefly list the most important publications and presentations from the past five years – title, co-authors if any, where published and/or presented, date of publication or presentation:

<table>
<thead>
<tr>
<th>Date</th>
<th>Citation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>Li F., Ong M., Zhao Y., Qian G., and Fu J. A feasible and terrain-insensitive approach for analyzing power wheelchair users' mobility; 29th IEEE International Conference on Tools with Artificial Intelligence (ICTAI ’17), pp. 586-590, 2017</td>
</tr>
<tr>
<td>2016</td>
<td>Fu, J., Jones M., Liu T., Hao W., Yan Y., Qian, G., and Jan Y. A novel mobile-cloud system for capturing and analyzing wheelchair maneuvering data: a pilot study; Assistive Technology, 28(2): 105-114, 2016</td>
</tr>
<tr>
<td>2015</td>
<td>Liu, T., Chen, C., King, M., Qian, G., and Fu, J. Balancing power consumption and data analysis accuracy through adjusting sampling rates: seeking for the optimal configuration of inertial sensors for power wheelchair users; Digital Human Modeling. Applications in Health,</td>
</tr>
</tbody>
</table>

http://www.ohiobec.edu/admin-fac/academic-forms.shtml


10. Briefly list the most recent professional development activities:

<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>“CMS Grants Retreat”, Norman, OK</td>
</tr>
<tr>
<td>2018</td>
<td>“The 29th Annual Consortium for Computer Sciences in Colleges South Central Regional Conference”, Fort Worth, Texas</td>
</tr>
<tr>
<td>2017</td>
<td>“CMS Grants Retreat”, Norman, OK</td>
</tr>
<tr>
<td>2014</td>
<td>“The 23rd International Conference on Software Engineering and Data Engineering (SEDE 14)”, New Orleans, LA</td>
</tr>
<tr>
<td>2014</td>
<td>“OSRHE Seminar on Crowdfunding Policy”, UCO</td>
</tr>
</tbody>
</table>

**Additional tenure/tenure track and continuing faculty providing partial support for this program:**
These faculty members provide varying levels of additional support to this program in the form of classroom instruction, sponsorship of undergraduate research, advising, mentoring student professional groups, etc.

1. Name: Mohammad Robiul Hossan

2. Education – degree, discipline, institution, year:

<table>
<thead>
<tr>
<th>Degree</th>
<th>Discipline</th>
<th>Institution</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.S.</td>
<td>Electrical Engineering</td>
<td>Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh</td>
<td>2002</td>
</tr>
<tr>
<td>M.S.</td>
<td>Mechanical Engineering</td>
<td>South Dakota State University, Brookings, SD</td>
<td>2008</td>
</tr>
<tr>
<td>M.S.</td>
<td>Industrial Management</td>
<td>South Dakota State University, Brookings, SD</td>
<td>2009</td>
</tr>
<tr>
<td>Ph.D.</td>
<td>Mechanical Engineering</td>
<td>Washington State University, Pullman, WA</td>
<td>2013</td>
</tr>
</tbody>
</table>

3. Academic experience – institution, rank, title (chair, coordinator, etc. if appropriate), when (ex. 1990-1995), full time or part time:

<table>
<thead>
<tr>
<th>Institution</th>
<th>Rank</th>
<th>Title</th>
<th>Dates Held</th>
<th>FT/PT</th>
</tr>
</thead>
<tbody>
<tr>
<td>UCO</td>
<td>Associate Professor</td>
<td>Teaching Assistant</td>
<td>2018-present</td>
<td>FT</td>
</tr>
<tr>
<td>UCO</td>
<td>Assistant Professor</td>
<td>Teaching Assistant</td>
<td>2013-2018</td>
<td>FT</td>
</tr>
<tr>
<td>Washington State University</td>
<td>Research and Teaching Assistant</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. Non-academic experience – company or entity, title, brief description of position, when (ex. 1993-1999), full time or part time:

<table>
<thead>
<tr>
<th>Organization</th>
<th>Title</th>
<th>Duties</th>
<th>Dates</th>
<th>FT/PT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daktronics Inc., SD</td>
<td>Student Employee</td>
<td></td>
<td>2006-2008</td>
<td>PT</td>
</tr>
</tbody>
</table>

[http://www.olehsered.org/admin-fac/academic-forms.shtml](http://www.olehsered.org/admin-fac/academic-forms.shtml)
5. Certifications or professional registrations: None

6. Membership in professional organizations:
   - Member: American Society of Mechanical Engineers (ASME)

7. Honors and Awards:
   - UCO Faculty Merit Credit Research Award, 2017
   - UCO Faculty Merit Credit Teaching Award, 2016
   - NIH OK-INBRE Research Opportunity Award, 2015
   - NIH OK-INBRE Mentorship, 2014
   - UCO Digital Central Academy Award, 2014
   - NSF CURE STEM Scholar, University of Central Oklahoma, 2013-present

8. Service activities (within and outside of the institution):
   - Vice-chair, ASME micro/nano fluidic systems technical committee, 2018-2020
   - Topic Co-organizer, ASME-KSME-JSME FED Summer meeting and IMECE 2019
   - Track organizer, ASME IMECE (2017, 2018) and ASME FED summer meeting 2017
   - Session organizer, IMECE (2014, 2016-2018)
   - Mechanical Engineering undergraduate program director, UCO, 2014-present
   - Faculty Adviser of MSA and ASME student club, University of Central Oklahoma
   - Mechanical Engineering Curriculum Committee, University of Central Oklahoma

9. Briefly list the most important publications and presentations from the past five years – title, co-authors if any, where published and/or presented, date of publication or presentation:

10. Briefly list the most recent professional development activities:
   - NIH OK-INBRE Mini Grant, Hosnan (PI), 05/2018 – 04/2019, Extraction and Concentration of Prostaglandin E Metabolite in a Microchannel ($30257)
   - NIH OK-INBRE Large Equipment Grant, Hosnan (PI) 05/2018 – 04/2019, Effect of engineered surface topography on the immobilization of molecules with substrates ($24600)
   - UCO Faculty Interdisciplinary Grant, Hosnan (PI), 08/2018 – 05/2019, Microfluidic Platform for Prostaglandin E Metabolite (PGEM) Quantification ($5200)
   - UCO Faculty Interdisciplinary Grant, Hosnan (co-PI), 08/2018 – 05/2019, The Enrichment and Detection of Low Abundant Cytokines Using a Microfluidic Platform ($7750)
   - NIH OK-INBRE Large Equipment Grant, Hosnan (PI), 05/2017 – 04/2018, Acquisition of Micro-scale Particle Image Velocimetry for Biomedical Research ($24,970)

http://www.oklahomad.edu/admin-fac/academic-forms.shtml
• NIH OK-INBRE Mini Equipment Grant, *Hossan (co-PI)*, 05/2017 – 04/2018, *Acquisition of a High Speed Camera to Enhance Biomedical Research at UCO* ($14909)
• UCO Faculty Interdisciplinary Grant, *Hossan (PI)*, 08/2017 – 06/2018, *The Effect of Joule Heating and Dynamic Cell Assessment in Microfluidic Devices* ($8000)
• UCO Faculty Interdisciplinary Grant, *Hossan (co-PI)*, 08/2017 – 06/2018, *The impact of laser assisted microgrooves on the immobilization of nanofibers matrix and molecules on biomaterials* ($8,000)
• UCO Faculty Interdisciplinary Grant, *Hossan (PI)*, 08/2016 – 05/2017, *The Impact of Electric Field Parameters on Microfluidic Osteoblast Cell Separation* ($8500)

1. Name: **Charles Hughes**

2. Education – degree, discipline, institution, year:

<table>
<thead>
<tr>
<th>Degree</th>
<th>Discipline</th>
<th>Institution</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.S.</td>
<td>Applied Physics</td>
<td>Michigan Technological University</td>
<td>1981</td>
</tr>
<tr>
<td>M.S.</td>
<td>Physics</td>
<td>University of Georgia</td>
<td>1983</td>
</tr>
<tr>
<td>Ph.D.</td>
<td>Physics</td>
<td>University of Georgia</td>
<td>1988</td>
</tr>
</tbody>
</table>

3. Academic experience – institution, rank, title (chair, coordinator, etc. if appropriate), when (ex. 1990-1995), full time or part time:

<table>
<thead>
<tr>
<th>Institution</th>
<th>Rank</th>
<th>Title</th>
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<tbody>
<tr>
<td>UCO</td>
<td>Professor</td>
<td>Chair, Dept of Engineering and Physics</td>
<td>2003-present</td>
<td>FT</td>
</tr>
<tr>
<td>UCO</td>
<td>Professor</td>
<td>Assoc VP Institutional Effectiveness</td>
<td>2010-2015</td>
<td>FT</td>
</tr>
<tr>
<td>UCO</td>
<td>Associate</td>
<td>College of Math and Science</td>
<td>1998-2003</td>
<td>FT</td>
</tr>
<tr>
<td>UCO</td>
<td>Professor</td>
<td></td>
<td>1993-1998</td>
<td>FT</td>
</tr>
<tr>
<td>Arkansas State University</td>
<td>Associate Professor</td>
<td></td>
<td>1988-2003</td>
<td>FT</td>
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4. Non-academic experience – company or entity, title, brief description of position, when (ex. 1993-1999), full time or part time

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<th>Title</th>
<th>Duties</th>
<th>Dates</th>
<th>FT/PT</th>
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<tbody>
<tr>
<td>Lawrence Livermore National Laboratory</td>
<td>Physicist</td>
<td>Computational Physics Using Large Basis Nuclear Shell Model Codes</td>
<td>1984, 1985</td>
<td>FT</td>
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5. Certifications or professional registrations: None

6. Membership in professional organizations:

   [http://www.okhighered.org/admin-fac/academic-forms.shtml](http://www.okhighered.org/admin-fac/academic-forms.shtml)
7. Honors and Awards:
   • UCO “Modeling the Way” Award (2007).
   • UCO College of Mathematics and Science Spirit Award (2003).
   • Honoree and Invited Speaker, Third National Conference on School/College Collaborations, American Association for Higher Education (1992).

8. Service activities (within and outside of the institution):
   • ABET Coordinator – UCO Department of Engineering and Physics (2017-2018).
   • Member, STLR Steering Committee, 2017-present.
   • UCO STLR Project Director (2013-15).
   • Co-facilitator, UCO University Planning Group (2014-15).
   • Co-facilitator, UCO Program Prioritization Task Force (2010).
   • Co-facilitator, UCO NSSE Action Team (2010).
   • Coordinator, UCO Continuous Improvement Facilitators (CIF), 2005-2010.
   • Speaker, UCO New Chair Orientation (2011-2014).
   • Co-facilitator, UCO Retention Committee (2007-2010).
   • Examiner, New Mexico Quality Initiative (2003).
   • UCO Mentor, Teacher Entry Year Committee for 7 teacher candidates, (1993-2000).

9. Briefly list the most important publications and presentations from the past five years – title, co-authors if any, where published and/or presented, date of publication or presentation:
   • John Barthel, Wei Chen, Beverly Endicott, Charles Hughes, William Radke, Charlotte Simmons, Gregory Wilson, “Encouraging and Sustaining a Culture of Student-Centered Research at a Predominantly Undergraduate Institution,” CUR Quarterly Vol 34 No 1 (Fall 2013), Council on Undergraduate Research.

10. Briefly list the most recent professional development activities:

http://www.oklahoned.org/admin-fac/academic-forms.shtml

1. Name: Morshed Khandaker

2. Education – degree, discipline, institution, year:

<table>
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<th>Degree</th>
<th>Discipline</th>
<th>Institution</th>
<th>Year</th>
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<tr>
<td>B.S.</td>
<td>Mechanical</td>
<td>Bangladesh University of Engineering &amp; Technology, Engineering Dhaka</td>
<td>1999</td>
</tr>
<tr>
<td>M.S.</td>
<td>Mechanical</td>
<td>Texas Tech University, Lubbock, TX</td>
<td>2002</td>
</tr>
<tr>
<td>Ph.D.</td>
<td>Mechanical</td>
<td>Texas Tech University, Lubbock, TX</td>
<td>2005</td>
</tr>
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</table>

3. Academic experience – institution, rank, title (chair, coordinator, etc. if appropriate), when (ex. 1990-1995), full time or part time:

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<th>Rank</th>
<th>Title</th>
<th>Dates Held</th>
<th>FT/PT</th>
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</thead>
<tbody>
<tr>
<td>University of Central Oklahoma</td>
<td>Professor</td>
<td></td>
<td>2017-Present</td>
<td>FT</td>
</tr>
<tr>
<td>University of Central Oklahoma</td>
<td>Associate Professor</td>
<td></td>
<td>2013-2017</td>
<td>FT</td>
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<tr>
<td>University of Central Oklahoma</td>
<td>Assistant Professor</td>
<td></td>
<td>2008-2013</td>
<td>PT</td>
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4. Non-academic experience – company or entity, title, brief description of position, when (ex. 1993-1999), full time or part time

- Internship at Philips Research, Briarcliff Manor, NY, 7/04-8/04.
- Co-op at Applied Materials, Austin, TX, 6/02-8/02.

5. Certifications or professional registrations: None

6. Membership in professional organizations:

- American Society of Mechanical Engineering (ASME)
- Orthopedic Research Society (ORS)
- Biomedical Engineering Society (BMES)

7. Honors and Awards:

- 2017 Vanderford Undergraduate Research Award.
- 2017 Faculty Merit award in the category of research, UCO.
- 2015 Faculty Merit award in the category of research, UCO.

8. Service activities (within and outside of the institution):

- Faculty advisor: UCO ASME student chapter, 2011-2014.
- UCO faculty senator, 2012-2014.
- UCO graduate counselor: 2009-2012.

9. Briefly list the most important publications and presentations from the past five years – title, co-authors if any, where published and/or presented, date of publication or presentation:

- Peer-reviewed articles (2008-present): 21
- Proceeding papers (2008-present): 27
- Book chapters: 5
- Lab Manuals: 1

10. Briefly list the most recent professional development activities:

Patents

http://www.okhigered.org/admin-fac/academic-forms.shtml
• M. Khandaker and S. Riahinezhad*, "Engineered intervertebral disc (IVD) for degenerated disc disease," Patent granted, Date of award June 12, 2018
• M. Khandaker and S. Riahinezhad*, "Method and apparatus to coat a metal implant with an extracellular matrix made with electrospun fiber," Patent granted, Date of award November 7, 2017.
• M. Khandaker and W. Snow**, "Method and apparatus for the controlled deposition of branched electrospun fiber on biomedical implants and material," Patent granted, Date of award June 12, 2016.

Completed funded research projects:
• NSF/OKEPScO ROA (PI), 05/01/17-8/30/17, "Immobilization and characterization of metal oxides in electrospun nanofiber for detection of gases."
• NSF/OKEPScO ROA (co-PI), 05/01/17-8/30/17, "Effect of laser nanotexturing on the plasma nitriding of titanium."
• The University of Central Oklahoma On campus Interdisciplinary faculty grant Program, 08/15/17-05/01/18 "The impact of laser-assisted microgrooves on the immobilization of nanofibers matrix and proteins."
• NIH/OKINBRE Small Equipment "Acquisition of EXAKT systems for histological analysis of bone with a metal implant." Role: PI, funding period: 05/01/16-4/30/17.
• UCO On campus Interdisciplinary grant Program, role: PI, FY 2016-17, "Effect of electrospun fiber on the in vivo histological osseointegration of titanium for cementless and cemented surgeries."

Peer Reviewed Journals

1. Name: Evan C. Lemley
2. Education — degree, discipline, institution, year:

<table>
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<th>Degree</th>
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<tr>
<td>B.A.</td>
<td>Physics</td>
<td>Hendrix College</td>
<td>1989</td>
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http://www.olduhered.org/admin-fac/academic-forms.shtml
M.S.M.E. Mechanical Engineering  Univ. of Arkansas  1991
Ph.D.  Engineering (Mech. And Nuclear Systems)  Univ. of Arkansas  1996

3. Academic experience – institution, rank, title (chair, coordinator, etc. if appropriate), when (ex. 1990-1995), full time or part time:

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<th>Rank</th>
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<tr>
<td>UCO</td>
<td>Professor</td>
<td>Asst. Dean</td>
<td>2011-present</td>
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<td>UCO</td>
<td>Associate</td>
<td>Professor</td>
<td>2003-2007</td>
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<tr>
<td>UCO</td>
<td>Assistant</td>
<td>Researcher</td>
<td>1998-2003</td>
<td>FT</td>
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<tr>
<td>Univ. of Ark.</td>
<td></td>
<td>Instructor</td>
<td>1997</td>
<td>PT</td>
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4. Non-academic experience – company or entity, title, brief description of position, when (ex. 1993-1999), full time or part time:

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<th>Title</th>
<th>Duties</th>
<th>Dates</th>
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5. Certifications or professional registrations: None

6. Membership in professional organizations:
   - Member: American Society for Engineering Education (ASEE)
   - Member: American Society of Mechanical Engineers (ASME)
   - Member: National Professional Science Master’s Association (NPSMA)
   - Member: Oklahoma Academy of Science (OAS)

7. Honors and Awards:
   - 2011 Vanderford Undergraduate Faculty Award for Undergraduate Research, Creative, and Scholarly Activities (one award across UCO campus)
   - 2006 UCO Sigma Xi Distinguished Scientific Researcher
   - 1999 Inducted as member Sigma Xi Scientific Research Society
   - 1994-1995 Department of Energy Trainee
   - 1991 Inducted as member Society of Phi Kappa Phi

8. Service activities (within and outside of the institution):
   - Program Chair for ASEE Engineering Physics and Physics Division, 2012-2013.
   - Current Director – Center for Research and Education in Interdisciplinary Computation (CREIC) – to help the college in area of high performance computing and other computational efforts.
   - Serve currently as Asst. Dean College of Mathematics and Science overseeing all college technology as CREIC director.

9. Briefly list the most important publications and presentations from the past five years – title, co-authors if any, where published and/or presented, date of publication or presentation:

http://www.oldhighered.org/admin-fac/academic-forms.shtml


10. Briefly list the most recent professional development activities:

- Annual attendance at ASEE, ASME (Fluids Engr. Div.); Supercomputing 11 & 12.

1. Name: Scott P. Mattison

2. Education – degree, discipline, institution, year:

<table>
<thead>
<tr>
<th>Degree</th>
<th>Discipline</th>
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<th>Year</th>
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<tr>
<td>B.S.</td>
<td>Bioengineering</td>
<td>Clemson University</td>
<td>2011</td>
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<tr>
<td>Ph.D.</td>
<td>Biomedical Engineering</td>
<td>Texas A&amp;M University</td>
<td>2016</td>
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3. Academic experience – institution, rank, title (chair, coordinator, etc. if appropriate), when (ex. 1990-1995), full time or part time:

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<th>Rank</th>
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<th>Dates Held</th>
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<tr>
<td>UCO</td>
<td>Assistant Professor</td>
<td>2017-2017</td>
<td>FT</td>
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<tr>
<td>Texas A&amp;M University</td>
<td>Postdoctoral Scholar</td>
<td></td>
<td>2015</td>
<td>PT</td>
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<tr>
<td>Texas A&amp;M University</td>
<td>Instructor of Record</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Texas A&amp;</td>
<td>Research and Teaching Assistant</td>
<td></td>
<td>2011-2016</td>
<td>FT</td>
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http://www.okinghered.org/admin-fac/academic-forms.shtml
4. Non-academic experience – company or entity, title, brief description of position, when (ex. 1993-1999), full time or part time: None

5. Certifications or professional registrations: None

6. Membership in professional organizations:
   - Member: Tau Beta Pi
   - Member: SPIE

7. Honors and Awards:
   - University of Central Oklahoma CURE-STEM Faculty Scholarship (2017)
   - Finalist, Texas A&M Three-Minute Thesis Competition (2014)
   - NSF Graduate Research Fellowship Program Honorable Mention (2013)
   - Texas A&M Graduate Merit Fellowship (2011)
   - Clemson University Dixon Fellows (2008)

8. Service activities (within and outside of the institution):
   - Faculty Advisor of UCO BMES student chapter (2018 – Present)
   - Senator, UCO Faculty Senate (2018 – Present)
   - BME Program Coordinator – Department of Engineering and Physics (2018-present)

9. Briefly list the most important publications and presentations from the past five years – title, co-authors if any, where published and/or presented, date of publication or presentation:

10. Briefly list the most recent professional development activities:

1. Name: Weldon Wilson

2. Education – degree, discipline, institution, year:

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<th>Degree</th>
<th>Discipline</th>
<th>Institution</th>
<th>Year</th>
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<tr>
<td>B.S.</td>
<td>Physics</td>
<td>Oklahoma State University</td>
<td>1973</td>
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<tr>
<td>Ph.D.</td>
<td>Physics</td>
<td>Oklahoma State University</td>
<td>1980</td>
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http://www.okhighered.org/admin-fac/academic-forms.shtml
3. Academic experience – institution, rank, title (chair, coordinator, etc. if appropriate), when (ex. 1990-1995), full time or part time:

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<td>UCO</td>
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<td>2000-present</td>
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<tr>
<td>UCO</td>
<td>Associate</td>
<td></td>
<td>1997-2000</td>
<td>FT</td>
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<tr>
<td>UCO</td>
<td>Professor</td>
<td></td>
<td>1992-1997</td>
<td>FT</td>
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<tr>
<td>University of Central Florida</td>
<td>Assistant</td>
<td></td>
<td>1982-1985</td>
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4. Non-academic experience – company or entity, title, brief description of position, when (ex. 1993-1999), full time or part time:

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<th>Dates</th>
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<tbody>
<tr>
<td>Occidental Petroleum</td>
<td>Advisor</td>
<td>Special Projects for CEO</td>
<td>1987-1992</td>
<td>FT</td>
</tr>
<tr>
<td>Occidental Petroleum</td>
<td>Senior</td>
<td>Fracturing</td>
<td>1985-1987</td>
<td>FT</td>
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<tr>
<td>Cities Service Oil and Gas Company</td>
<td>Research Physicist</td>
<td>Development Pressure Transient Analysis Research</td>
<td>1980-1982</td>
<td>FT</td>
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</table>

5. Certifications or professional registrations: None

6. Membership in professional organizations:
   - American Physical Society (APS)
   - American Association of Physics Teachers (AAPT)
   - Oklahoma Academy of Science (OAS)

7. Honors and Awards:
   - Outstanding Professor Academy (2000)
   - Project Kaleidoscope Faculty for th 21st Century (1994)

8. Service activities (within and outside of the institution):
   - Graduate Program Coordinator – Department of Engineering and Physics (2012-present)
   - Committee Chair – PhD - New Program Proposal Committee (2017-Present)
   - Department Tenure and Promotion Committee (2000 – present)
   - Physical Sciences Executive Council Representative – Oklahoma Academy of Science (2000-present)
   - Judge – Oklahoma Regional Science Fair (2000-present)

9. Briefly list the most important publications and presentations from the past five years – title, co-authors if any, where published and/or presented, date of publication or presentation:

http://www.okhighered.org/admin_facacademic-forms.shtml

10. Briefly list the most recent professional development activities:


1. Name: Gang Xu

2. Education – degree, discipline, institution, year:

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<tbody>
<tr>
<td>D.Sc.</td>
<td>Biomedical Engineering</td>
<td>Washington University in St. Louis</td>
<td>2006</td>
</tr>
<tr>
<td>M.S.</td>
<td>Biomedical Engineering</td>
<td>Washington University in St. Louis</td>
<td>2004</td>
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<tr>
<td>M.S.</td>
<td>Fluid Mechanics (Biomechanics)</td>
<td>Fudan University (China)</td>
<td>2001</td>
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<tr>
<td>B.S.</td>
<td>Theoretical &amp; Applied Mechanics</td>
<td>Fudan University (China)</td>
<td>1998</td>
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3. Academic experience – institution, rank, title (chair, coordinator, etc. if appropriate), when (ex. 1990-1995), full time or part time:

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<th>Rank</th>
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<th>Dates Held</th>
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<tbody>
<tr>
<td>University of Central Oklahoma</td>
<td>Associate Professor</td>
<td>2017-present</td>
<td>FT</td>
<td></td>
</tr>
<tr>
<td>University of Central Oklahoma</td>
<td>Assistant Professor</td>
<td>2012-2017</td>
<td>FT</td>
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<tr>
<td>Washington University</td>
<td>Research Assistant</td>
<td>2009-2012</td>
<td>FT</td>
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<tr>
<td>Washington University</td>
<td>Postdoctoral Associate</td>
<td>2006-2009</td>
<td>FT</td>
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4. Non-academic experience – company or entity, title, brief description of position, when (ex. 1993-1999), full time or part time: None

5. Certifications or professional registrations: None

6. Membership in professional organizations:

http://www.okhighered.org/admin-facacademic-foms.shtml
• Member, Oklahoma Academy of Science
• Editorial Board Member, AIMS Biophysics
• Member, Council on Undergraduate Research
• Member, American Society for Engineering Education
• Member, Tissue and Cellular Engineering Committee, American Society of Mechanical Engineering

7. Honors and Awards:
• Travel Award, Sustainable Research Pathways Workshop, Berkeley Lab, CA, 2017 & 2018
• Oklahoma INBRE Travel Award, 2017 & 2018
• Faculty Merit Credit Award on Research, University of Central Oklahoma, 2015 & 2017
• Outstanding Spirit Award, College of Mathematics and Science, University of Central Oklahoma, 2017
• Faculty Merit Credit Award on Research, University of Central Oklahoma, 2015
• Herbert Dordick Award for an Outstanding Mentor, University of Central Oklahoma, 2014
• Research Opportunity Award, Oklahoma INBRE, 2013
• Research Fellowship, Children’s Discovery Institute, 2012

8. Service activities (within and outside of the institution):
• 2019 Vice Chair, Engineering Sciences Section, Oklahoma Academy of Science
• 2018 Chair, Engineering Sciences Section, Oklahoma Academy of Science
• 2017- Editorial board Member, AIMS Biophysics
• 2012- Coordinator, Biomedical Engineering Laboratory
• Member, Graduate Program Committee
• Member, Student Scholarships and Awards Committee
• Advisor, Engineering Student Advisement
• 2018- Member, College Tenure Review Committee
• 2015-2017 Program Coordinator, Fulbright Visiting Scholar Program for Iraq
• 2016-2018 Member, NCUR 2018 Abstract Committee
• 2013- Mentor, New Faculty Mentoring Program, CETTL

9. Briefly list the most important publications and presentations from the past five years—title, co-authors if any, where published and/or presented, date of publication or presentation
10. Briefly list the most recent professional development activities:
   • 9/2018 – 4/2019 Academic Leadership Fellows Academy
   • 5/2017 – 3/2018 Educators’ Leadership Academy Higher Ed Department Chair Academy

1. Name: Shuai Zhang

2. Education – degree, discipline, institution, year:

<table>
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<tr>
<th>Degree</th>
<th>Discipline</th>
<th>Institution</th>
<th>Year</th>
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<tr>
<td>Ph.D.</td>
<td>Computer Science</td>
<td>The University of Texas at Dallas</td>
<td>2019</td>
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<tr>
<td>M.S.</td>
<td>Electronic Information Science and Technology</td>
<td>University of Science and Technology of China</td>
<td>2012</td>
</tr>
<tr>
<td>B.S.</td>
<td>Electronic Information Science and Technology</td>
<td>University of Science and Technology of China</td>
<td>2009</td>
</tr>
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</table>

3. Academic experience – institution, rank, title (chair, coordinator, etc. if appropriate), when (ex. 1990-1995), full time or part time:

   2019.08 - University of Central Oklahoma, Edmond, Oklahoma
   Current Assistant Professor Full Time

4. Non-academic experience – company or entity, title, brief description of position, when (ex. 1993-1999), full time or part time

   2017.05-2018.08 Google Software Engineering Intern Full Time
   Worked on extending TensorFlow machine learning toolkit for mobile platform, to improve the user customization experience.

   2011.02-2011.12 Nokia Research Center (Beijing) Intern Research Engineer Full Time
   Worked on hand gesture interaction algorithm and the applications.

5. Certifications or professional registrations: None

6. Membership in professional organizations: None

7. Honors and Awards: None

8. Service activities (within and outside of the institution): None

9. Briefly list the most important publications and presentations from the past five years – title, co-authors if any, where published and/or presented, date of publication or presentation

   Date   Citation


10. Briefly list the most recent professional development activities:

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<tr>
<th>Date</th>
<th>Activity</th>
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<tr>
<td>2017</td>
<td>11th IEEE International Conference on Semantic Computing (ICSC 2017), San Diego, CA</td>
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1. Name: Wei R. Chen

2. Education – degree, discipline, institution, year:

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<td>B.S.</td>
<td>Physics</td>
<td>Shandong University, China</td>
<td>1982</td>
</tr>
<tr>
<td>M.S.</td>
<td>Physics</td>
<td>University of Oregon, Eugene, Oregon</td>
<td>1984</td>
</tr>
<tr>
<td>Ph.D.</td>
<td>Physics</td>
<td>University of Oregon, Eugene, Oregon</td>
<td>1988</td>
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3. Academic experience – institution, rank, title (chair, coordinator, etc. if appropriate), when (ex. 1990-1995), full time or part time:

<table>
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<th>Institution</th>
<th>Rank</th>
<th>Title</th>
<th>Dates Held</th>
<th>FT/PT</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Central Oklahoma</td>
<td>Professor</td>
<td></td>
<td>2005-present</td>
<td>FT</td>
</tr>
<tr>
<td>University of Central Oklahoma</td>
<td>Associate</td>
<td></td>
<td>2001-2005</td>
<td>FT</td>
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<tr>
<td>University of Central Oklahoma</td>
<td>Professor</td>
<td></td>
<td>1999-2001</td>
<td>FT</td>
</tr>
<tr>
<td>Oklahoma School of Science and Mathematics</td>
<td>Instructor</td>
<td></td>
<td>1989-1999</td>
<td>FT</td>
</tr>
<tr>
<td>St. Louis University</td>
<td>Instructor</td>
<td></td>
<td>1988-1989</td>
<td>FT</td>
</tr>
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4. Non-academic experience – company or entity, title, brief description of position, when (ex. 1993-1999), full time or part time: None

5. Certifications or professional registrations: None

6. Membership in professional organizations:
   - Member and Fellow: International Society of Photonics and Optics (SPIE)
   - Member: Sigma Xi

7. Honors and Awards:
   - SPIE Fellow, elected since 2007
   - SPIE Educator Award, 2012
   - US Professor of the Year, 2008
   - US Fulbright Lecturing/Research Award, 2011-2012
   - Medal for Excellence in Teaching, Oklahoma Foundation for Excellence

http://www.okbipocred.org/admin-fac/academic-forms.shtml
8. Service activities (within and outside of the institution):
   - Sigma Xi UCO Chapter, President-Elect, President, Past-President, 2011-2013.
   - Interim Dean, College of Mathematics and Science and Mathematics, 2015-2016.
   - Dean, College of Mathematics and Science and Mathematics, 2016-present.

9. Briefly list the most important publications and presentations from the past five years – title, co-authors if any, where published and/or presented, date of publication or presentation
   - Peer-reviewed articles (2015-2019): 32

10. Briefly list the most recent professional development activities:
    - Principal Investigator; “Cellular immunological responses induced by glycated chitosan”, $25,000, 01/01/2015 to 12/31/2016, ImmunoPhotonics, Inc., St. Louis, MO.
    - Principal Investigator; “Fulbright Visiting Scholar Program for Iraq”, $72,500, 06/01/2015 to 09/31/2015, Council for International Exchange of Scholars, Institute of International Education.
    - Principal Investigator; “Effects of interstitial inCVAX for the treatment of metastatic tumors in rats”, $71,000 ($56,800 direct), 09/01/2015 to 12/31/2016, Confluence, Inc., St. Louis, MO.
    - Principal Investigator; “Fulbright Visiting Scholar Program for Iraq”, $58,000 ($50,209 direct) 06/01/2016 to 09/31/2016, Council for International Exchange of Scholars, Institute of International Education.
    - Principal Investigator; “Effect of TGF-β reduction on laser immunotherapy for treating metastatic cancers”, $67,117 (50,000 direct), 07/19/2016 to 04/30/2017, IDEA Networks of Biomedical Research Excellence (INBRE) Grant, National Center for Research Resources, National Institute of Health (NIH). (No.: RS20132225-106).
    - Principal Investigator; “Combination treatment with laser immunotherapy and checkpoints for advanced melanoma”, $80,000 ($72,727 direct), 07/01/2016 to 06/30/2017, Immunophotonics, Inc., St. Louis, MO.
    - Principal Investigator; “Phototherapy for metastatic breast cancer using immunologically modified carbon nanotubes”, $135,000 ($135,000 direct), 09/01/2016 to 08/30/2019, OCAST (Project No. HR16-085).
    - Principal Investigator; “Fulbright Visiting Scholar Program for Iraq”, $101,500 ($87,651 direct) 06/01/2017 to 09/31/2017, Council for International Exchange of Scholars, Institute of International Education.
    - Principal Investigator; “Enhancing laser immunotherapy by reduction of TGF-β for metastatic cancers”, $66,960 (50,000 direct), 05/01/2017 to 04/30/2018, IDEA Networks of Biomedical Research Excellence (INBRE) Grant, National Center for Research Resources, National Institute of Health (NIH). (No.: RS20132225-106).
    - Principal Investigator; “Mechanistic study on synergistic photo-immunological effects of laser immunotherapy for metastatic cancers”, $1,374,355 ($1,143,750 direct), 08/04/2017 to 07/31/2022, NIH National Cancer Institute (NCI). (No. 1R01CA205348-01A1).
    - Principal Investigator; “Fulbright Visiting Scholar Program for Iraq”, $107,061 ($93,873 direct) 04/01/2018 to 11/30/2018, Council for International Exchange of Scholars, Institute of International Education.
    - Principal Investigator; “Fulbright Visiting Scholar Program for Iraq”, $109,182 ($95,781 direct) 04/01/2019 to 11/30/2019, Council for International Exchange of Scholars, Institute of International Education.

1. Name: Tierney Harvey

2. Education – degree, discipline, institution, year:

<table>
<thead>
<tr>
<th>Degree</th>
<th>Discipline</th>
<th>Institution</th>
<th>Year</th>
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<tr>
<td>B.S.</td>
<td>Civil Engineering</td>
<td>University of Virginia</td>
<td>2009</td>
</tr>
<tr>
<td>Ph.D.</td>
<td>Civil and Environmental Engineering</td>
<td>Duke University</td>
<td>2015</td>
</tr>
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</table>

http://www.okhighered.org/admin-fae/academic-forms.shtml
3. Academic experience – institution, rank, title (chair, coordinator, etc. if appropriate), when (ex. 1990-1995), full time or part time:

<table>
<thead>
<tr>
<th>Institution</th>
<th>Rank</th>
<th>Title</th>
<th>Dates Held</th>
<th>FT/PT</th>
</tr>
</thead>
<tbody>
<tr>
<td>UCO</td>
<td>Lecturing</td>
<td>Professor</td>
<td>2015-present</td>
<td>FT</td>
</tr>
<tr>
<td>OCCC</td>
<td>Adjunct</td>
<td></td>
<td>2015-2017</td>
<td>PT</td>
</tr>
<tr>
<td>Duke University</td>
<td>Instructor</td>
<td></td>
<td>2014</td>
<td>PT</td>
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4. Non-academic experience – company or entity, title, brief description of position, when (ex. 1993-1999), full time or part time:

<table>
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<th>Organization</th>
<th>Title</th>
<th>Duties</th>
<th>Dates</th>
<th>FT/PT</th>
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</thead>
<tbody>
<tr>
<td>Environmental Protection Agency</td>
<td>Research</td>
<td>Assistant</td>
<td>2013-2015</td>
<td>PT</td>
</tr>
</tbody>
</table>

5. Certifications or professional registrations: None

6. Membership in professional organizations:
   a. American Association of Engineering Education (ASEE)

7. Honors and Awards:
   - Outstanding Faculty Award from OCCC (2017)
   - Bass Instructional Fellowship (2014)

8. Service activities (within and outside of the institution):
   - First Year Coordinator (2018-PRESENT)
   - ASME Co-Advisor (2017-PRESENT)
   - ASME Human Powered Vehicle Faculty Advisor (2018-PRESENT)

9. Briefly list the most important publications and presentations from the past five years – title, co-authors if any, where published and/or presented, date of publication or presentation

Peer Reviewed Journal Articles (published)

Conference Papers

http://www.okhighered.org/admin-fac/academic-forms.shtml
Posters and Presentations

- “American Sign Language Translation Glove”, (2018), Oklahoma Research Day, Northwestern Oklahoma State University, Enid, OK
- “Development of a Mobile Trace Correlation Method for Assessment of Air Emissions from Landfills and Other Area Sources”, (2014) Global Waste Management, Orlando, FL

10. Briefly list the most recent professional development activities:

- Developed Human Powered Vehicle Club. This is a student design competition under ASME where students will design, build, and compete with their vehicle at the ASME student conference.
- Developed the Student Ambassador Club where Engineering students along with myself provide tours for perspective students.
Appendix – Support Letters

July 14, 2020

Ms. Patti Neuhold
President, University of Central Oklahoma
100 North University Drive
Edmond, Oklahoma 73034

Dear Ms. Neuhold,

This letter is provided in support of the proposed Bachelor of Science in Computer Engineering at UCO. The departments of Engineering & Physics and Computer Science are proposing this new program jointly. This collaborative approach will provide a balanced curriculum that merges the strengths of each department.

The program has a number of features that make it unique compared to other Computer Engineering programs. It blends components of both electrical and software engineering, and includes a great deal more software than traditional programs. It provides flexible scheduling making the degree more accessible to working students.

The program also provides students an option to take one of three focus areas:

- The Cybersecurity Engineering Concentration is an area that is becoming more and more critical to many industries.
- The Control Systems Concentration is of particular interest by members of our board who are in the HVAC industry, but impacts many other manufacturing areas, as well.
- The Internet of Things, which merges hardware and software, is at the center of the smart device growth sector.

The needs for this knowledge are so great that the Federal Aviation Administration employs a whole series of engineers dedicated to Computer Engineering. By providing this particular engineering curricula, UCO will be vested to equip students with a highly sought after computer engineering knowledge base. Industry and government alike are hungry for this skill set in newly hired graduates.

Based on the above, I fully support the addition of this program to the other engineering programs at UCO.

Sincerely,

Michael Dunbar
Technical Operations Training Programs Team Manager

http://www.okhighered.org/admin-fac/academic-forms.shtml
March 03, 2020

President Patti Neuhold  
President, University of Central Oklahoma  
100 North University Drive  
Edmond, Oklahoma 73034

Subject: Support for the proposed Bachelor of Science in Computer Engineering

Dear President Neuhold,

I would like to offer my support for the proposed Bachelor of Science in Computer Engineering at UCO, which is being proposed as a joint program by the Department of Engineering & Physics and the Department of Computer Science. In Oklahoma, we face shortages in many areas of engineering and computer science, and computer engineering is no exception. UCO’s program will provide much needed help in addressing the shortage in this area.

I currently serve on the advisory boards of both departments and am very familiar with their programs and students. I have sponsored several senior engineering design projects with students in the Department of Engineering & Physics and these projects have greatly benefited several FAA projects. We have hired UCO graduates from programs in both the Engineering & Physics Department and the Computer Science Department over the years and have found the students to be highly competitive and well prepared for the workplace.

The Computer Engineering program proposed by UCO is unique in that it blends strong elements of both electrical engineering and computer science. Many Computer Engineering degrees are oriented far more toward the hardware side and do not contain such a strong component of computer science. I see this as a significant strength in the program that makes these graduates particularly well suited to industries in Oklahoma. The program also provides students with the ability to choose a concentration in one of three specialized areas: 1) Control Systems, 2) Internet of Things (embedded systems), or 3) Cybersecurity Engineering. These features, which have been identified as areas of need by advisory board members, help to make UCO’s program a unique addition to other programs in the state.

UCO’s metropolitan location and its efforts to provide classes conducive to working adults will make this degree opportunity available to students that would otherwise
choose a different career path. Again, I would like to emphasize my strong support for UCO's Computer Engineering program.

Sincerely,

B Jasseminjad

Baha Jasseminjad, Ph.D.
Technical Manager, ASRC Federal System Solutions
Oklahoma Communications Engineering Team (AJW-173)
Telecommunications Engineering Team (AJW-178-1)
Address:
FAA, Mike Monroney Aeronautical Center
Building 189/193
6500 S. MacArthur Blvd
OKC, OK 73169
Phone:
Office: (405) 954-0508
Cell: (405) 650-0060
Ms. Patti Neuhold  
President, University of Central Oklahoma  
100 North University Drive  
Edmond, Oklahoma 73034  

Dear Ms. Neuhold,

This letter is provided in support of the proposed Bachelor of Science in Computer Engineering at UCO. The departments of Engineering & Physics and Computer Science are proposing this new program jointly. This collaborative approach will provide a balanced curriculum that merges the strengths of each department.

OG&E hired two UCO Engineering graduates this last year and we have found both graduates to be knowledgeable and excellent resources for our organization. They brought with them a strong work ethic and unique life experiences, and I believe that the flexible scheduling and degree program that is accessible to working students is a big part of delivering that outcome.

I am in support of expanding the program at UCO to provide greater depth and opportunities for Engineering students, and this proposed Computer Engineering program will help to accomplish that goal.

I fully support the addition of this program to the other Engineering programs at UCO.

Sincerely,

James Thomas, Jr.  
Manager, Engineering Standards & Guides  
Oklahoma Gas & Electric Co.  
thomastj@zone.com
Ms. Patti Neuhold  
President, University of Central Oklahoma  
180 North University Drive  
Edmond, Oklahoma 73034

Dear Ms. Neuhold,

This letter is provided in support of the proposed Bachelor of Science in Computer Engineering at UCO. The departments of Engineering & Physics and Computer Science are proposing this new program jointly. This collaborative approach will provide a balanced curriculum that merges the strengths of each department.

The program has several features that make it unique compared to other Computer Engineering programs. It blends components of both electrical and software engineering, and includes a great deal more software than traditional programs. It provides flexible scheduling making the degree more accessible to working students.

The program also provides students an option to take one of three focus areas:

- The Cybersecurity Engineering Concentration is an area that is becoming more and more critical to many industries.
- The Control Systems Concentration is of particular interest by members of our board who are in the HVAC industry, but impacts many other manufacturing areas, as well.
- The Internet of Things, which merges hardware and software, is at the center of the smart device growth sector.

In my career, I have been exposed to working with professionals in information technology and informational security and I strongly believe this addition would train student for today’s workforce.

I fully support the addition of this program to the other engineering programs at UCO.

Respectfully,

Glenn Linnfberger CBET 
Manager, Clinical Engineering 
INTEGRIS Baptist Medical Center 
3300 NW Expressway 
Oklahoma City OK 73112 
(405) 949-4174 Office

http://www.oklahomede.org/admin-fac/academic-forms.shtml
Kristian Olivero
OC-ALC/EN
Tinker AFB, OK 73151

Ms. Patti Neuhold
President, University of Central Oklahoma
100 North University Drive
Edmond, Oklahoma 73034

Dear Ms. Neuhold,

I currently serve as Chairperson for the Department of Engineering & Physics Industrial Advisory Board, and in this role I am writing to offer my support for the proposed Bachelor of Science in Computer Engineering at UCO. The departments of Engineering & Physics and Computer Science are proposing this new program jointly, and the proposed degree provides a balanced curriculum that reflects the influence of each department. The government and industry partners represented on the advisory board currently hire many graduates from both departments and are quite pleased with the strength of the students that they produce. This collaborative degree will be a welcome and much needed addition to programs currently offered.

The board has frequently discussed the need for more Computer Engineering graduates in our state, and I have commented publicly on multiple occasions that current programs in the state are not producing enough of these graduates for our facility, let alone all of the other industries in the state. Computer Engineering degrees typically emphasize instruction on computer hardware driven by a strong focus on electrical engineering content. While there is strong electrical engineering content in this degree, UCO’s proposed Computer Engineering program also provides a heavy dose of software instruction as well. This unique blending of hardware and software skillsets separates UCO’s degree from the more traditional degrees offered by comprehensive universities. This more balanced approach was crafted to accommodate the expressed needs of the members of our advisory board, and these graduates will be well suited for positions at Tinker.

Many of UCO’s engineering majors are nontraditional and include working students with jobs and families that cannot take four years off to become a full-time student at a comprehensive university. Some are active military and some are veterans returning to school for the first time in years. These students are able to take advantage of UCO’s flexible course scheduling, while continuing to meet family and work obligations. A Computer Engineering program at UCO will make this discipline accessible to students who would not have this opportunity under current circumstances. Since the vast majority of UCO’s engineering graduates remain in Oklahoma after graduation, this program will also help strengthen both large and small industries throughout the state.

Another unique feature of UCO’s proposed program are the three areas of concentration that students can choose from while pursuing their degree:

- The Cybersecurity Engineering Concentration is crucial to our industry and is an area that will require continued growth in the future.

http://www.okhighered.org/admin-fac/academic-forms.shtml
• The Control Systems Concentration is of particular interest by members of our board who are in the HVAC industry, but impacts many other manufacturing areas, as well.
• The Internet of Things is projected to be one of the largest growth industries.

These areas of concentration present these students with timely instruction in fields that are currently having a critical impact on the computer engineering discipline.

In summary, I fully support this proposal for a Computer Engineering program at UCO as a crucial addition to the engineering and computer science programs at UCO and in our state.

Sincerely,

Kristian Olivero

7/31/2020

X Kristian Olivero

Signed by OLIVERO, KRISTIAN ALLEN 1265457975