APPENDIX A – FACULTY FOR THE B.S. IN MECHANICAL ENGINEERING TECHNOLOGY

Md Amiruzzaman, Ph.D.

Position: Assistant Professor, College of Aeronautics and Engineering
Degres: B.S., Computer Science (2006), National University
M.S., Computer Science (2011), Kent State University
M.Tech., Technology (2015), Kent State University
Ph.D., Curriculum and Instruction (2016), Kent State University

Before accepting a teaching position at Kent State University in 2016, Md Amiruzzaman worked as a computer programmer for nearly 10 years for several companies, both nationally and internationally. In addition, he has worked as a research assistant at Sejong University and Korea University. Prior to Kent State University, he taught at the National University and Korea University.

Dr. Amiruzzaman teaches 15 credit hours in the college each semester. He teaches the following courses, which will be required in the proposed major and are required in other college programs:

- TECH 26200 Programming for Engineers I
- TECH 36200 Programming for Engineers II

Darwin L. Boyd, Ph.D.

Position: Assistant Professor, College of Aeronautics and Engineering
Degrees: B.S., Physics (1982), Kent State University
M.A., Physics (1988), Kent State University
Ph.D., Physics (1991), Kent State University

Darwin Boyd worked as a research associate at NASA Lewis Research Center, in Cleveland, from 1990 to 1997. He has been a faculty member at Kent State University since 1994. He was also a NASA-ASEE summer faculty fellow at NASA Lewis Research Center, from 1996 to 1999. Dr. Boyd's research experience includes the study of Mössbauer effects in spin crossover systems and liquid crystals and the use of x-ray photoelectron spectroscopy and Auger electron microscopy in the study of metallic and ceramic materials. He also has worked in the design of ultra-high-vacuum systems, and has done extensive work in the design and implementation of computer-based data acquisition systems for numerous applications in laboratory environments. Currently, his research interests include the characterization of metal matrix and ceramic matrix composite materials using Auger electron spectroscopy. Dr. Boyd is a member of the Association of Technology, Management and Applied Engineering (ATMAE).

Dr. Boyd teaches a minimum of 12 credits in the college each semester. He teaches the following courses, which will be required in the proposed major and are required in other college programs:

- TECH 33031 Programmable Logic Controllers
- TECH 34002 Advanced Computer-Aided Design
- TECH 43030 Mechatronics
- TECH 43031 Mechatronics II
- TECH 43096 Individual Investigation in Applied Science and Technology
- TECH 47210 Sustainable Energy I
- TECH 47211 Sustainable Energy I

Aminur Chowdhury, Ed.D.

Position: Professor, College of Aeronautics and Engineering
Degrees: B.S., Industrial Technology (1974), Sam Houston State University
M.Ed., Educational/Instructional Technology (1976), Texas A&M University
Ed.D., Manufacturing/Mechanical Systems (1979), West Virginia University

In his over 30 years of higher education professional career, Aminur Chowdhury has served as the academic dean at Kent State University, Minnesota State University and Texas Southern University; as department chair at North Carolina A&T State University and Bowling Green State University; and as coordinator of graduate studies of industrial education and technology at Eastern Kentucky State University. His teaching, scholarship and research interests include project management, quality control, reliability engineering, burn-in/stress testing for component/system reliability and the Six-Sigma applications in industrial productivity/measurement and analysis. Dr. Chowdhury’s teaching and research includes technology assessment, technology forecasting, logistics, value engineering, process/production

control, and, production planning and decision-making. He has published and presented extensively. In recent years, he has integrated STEM as fundamental concepts into the curriculum of technology-based education programs at Kent State University.

Dr. Chowdhury teaches 12 credit hours per semester. He teaches the following course, which will be required in the proposed major and is required in other college programs:

- TECH 31000 Cultural Dynamics of Technology

John C. Duncan, Ph.D.

Position: Assistant Professor, College of Aeronautics and Engineering
Degrees: B.S., Aerospace Engineering Technology (1981), Kent State University
B.S., Electronics (1982), Chapman University
M.A., Technology (1988), Kent State University
Ph.D., Evaluation and Measurement (1996), Kent State University

In his more than 25 years at Kent State University, Dr. Duncan has taught a wide variety of undergraduate and graduate aeronautics courses, and has extensive experience in curriculum design and distance learning delivery methods. He has more than 40 years of experience in aviation, in a variety of areas and roles. He has substantial professional engineering and flight training/simulation experience, extensive experience in flight training and flight simulator design engineering. He has worked as a research scientist in aviation human factors research and has served as a curriculum and course evaluator for the American Council on Education since 1993. Dr. Duncan is a licensed pilot with an Advanced Ground Instructor (AGI) rating.

Dr. Duncan teaches 12 credit hours in the college each semester. He teaches the following required course in the proposed major, which is also required in other college programs:

- TECH 47211 Sustainable Energy II

Michael R. Fisch, Ph.D.

Position: Assistant Professor, College of Aeronautics and Engineering
Degrees: B.S., Physics (1974), John Carroll University
M.A., Physics (1975), John Carroll University
Ph.D., Applied Physics (1982), Harvard University

Michael Fisch has worked at Kent State since 1998. His affiliations include the Institute of Electrical and Electronics Engineers (IEEE), American Physical Society (APS) and American Chemical Society (ACS).

Dr. Fisch teaches 6 credit hours in the college each semester. He teaches the following courses, which will be required in the proposed major and are required in other college programs:

- TECH 33033 Hydraulics/Pneumatics
- TECH 33111 Strength of Materials
- TECH 33363 Metallurgy and Materials Science
- TECH 43096 Individual Investigation in Applied Science and Technology

Ronald D. Griswold, M.Tech.

Position: Adjunct, College of Aeronautics and Engineering
Degrees: M.Tech., Technology (2012), Kent State University

Ronald Griswold was an assistant professor for Kent State's mechanical engineering technology programs for 14 years, as well as an instructor at Youngstown State University. He has been a part-time instructor for both universities since 2015. He is a registered professional engineering in Ohio, and has professional experience as a tool and die maker, structural engineer, tooling engineer and construction engineer.

Mr. Griswold teaches 9 credit hours in the college each semester. He teaches the following required courses in the proposed major, which are also required in other college programs:

- TECH 43080 Industrial and Environmental Safety
- TECH 43550 Computer-Aided Manufacturing
- TECH 43580 Computer-Aided Machine Design

Ellis (Chuck) Ivan, M.B.A.

Position: Adjunct, College of Aeronautics and Engineering
Degrees: B.S., Electrical Engineering (1969), Youngstown State University
M.B.A., Business Administration (1975), University of Akron

Chuck Ivan is a member of and certified quality auditor by the American Society of Quality and a Registrar Accreditation Board-certified in quality management. He has worked as a chief engineer for the Superior Technology Company, a manager of assembly with the Vistar/King Company, a technical support manager with Diebold, an electrical assembly manager for the Meta Fab Company and the director of TQM/QA for the Will Burt Company. He also has extensive experience as an ISO 9000 management representative.

Mr. Ivan is a part-time faculty member and teaches 6-9 credit hours in the college each semester. He teaches the following required course in the proposed major, which is also required in other college programs:

- TECH 36620 Project Management in Engineering and Technology

Evren Koptur, Ph.D.

Position: Lecturer, College of Aeronautics and Engineering
Degrees: B.S., Computer Engineering (2003), University of Bahçeşehir (Turkey)
M.Tech., Technology (2005), Kent State University
Ph.D., Educational Psychology (2016), Kent State University

Evren Koptur's professional experiences includes IT support and technical services, where he developed and tested new inventory management system using SQL and new financial reporting system using Visual Basic, built local area networks, provided object-oriented design, programming and implementation support to the customer billing system, written in C++, prepared test plans and data, and user documentation for customer billing system.

Dr. Koptur teaches 15 credit hours in the college each semester. He teaches the following required course in the proposed major, which is also required in other college programs:

- TECH 26010 Introduction to Computer Engineering Technology

Nuttapong Phantkankum, M.Eng.

Position: Adjunct, College of Aeronautics and Engineering
Degrees: B.Eng., Electronics (2004), King Mongkut's Institute of Technology (Thailand)
M.Eng., Mechanical Engineering (2008), Chiang Mai University (Thailand)
M.Tech., Technology (2015), Kent State University

Nuttapong Phantkankum has been a part time instructor at Kent State University since 2016. He teaches 9 credit hours in the college each semester. He teaches the following course, which will be required in the proposed major and is required in other college programs:

- TECH 13580 Engineering Graphics I
- TECH 21021 Survey of Electricity and Electronics (lab portion of course)

Shin-Min Song, Ph.D.

Position: Professor, College of Aeronautics and Engineering
Degrees: B.S., Mechanical Engineering (1973), Tatung Institute of Technology (Taipei)
M.S., Mechanical Engineering (1981), The Ohio State University
Ph.D., Mechanical Engineering (1984), The Ohio State University

In his over 30 years of higher education professional career, Shin-Min Song has served as a professor in University of Illinois at Chicago, department chair in Northern Illinois University and dean of College of Applied Engineering, Sustainability and Technology of Kent State University. His teaching, scholarship and research interests include mechanical design, kinematics and dynamics, robotics, walking machines, automation, computer-aided design, computer-integrated manufacturing, energy and power, hydraulics and pneumatics and control theories. He has published and presented extensively in areas of his technical expertise. He has received the NSF Presidential Young Investigator Award and ASME Fellow.

Dr. Song teaches 9 credit hours in the college each semester. He teaches the following required course in the proposed major, which is also required in other college programs:

- TECH 20001 Energy/Power
- TECH 33040 Motors and Controllers
- TECH 43700 Computer Integrated Manufacturing
- TECH 43800 Applied Engineering Technology Seminar

Trent True, M.Tech.

Position: Lecturer-FEF Key Professor, College of Aeronautics and Engineering
Degrees: B.S., Technology (2005), Kent State University
M.Tech., Technology (2007), Kent State University

After eight years working as a foundry process engineer and production supervisor for Harrison Steel, Trent True joined Kent State University in 2004. He is a member of the American Foundry Society, Foundry Educational Foundation, Steel Founders' Society of America and Epsilon Pi Tau, and has expertise in metal casting, manufacturing and lean tools.

Mr. True teaches 11-15 credit hours in the college each semester. He teaches the following required courses in the proposed major, which are also required in other college programs:

- TECH 20002 Materials and Processes
- TECH 31065 Cast Metals

Roberto Uribe-Rendon, Ph.D.

Position: Professor, College of Aeronautics and Engineering
Degrees: B.S., Physics (1973), National Autonomous University of Mexico
M.S., Nuclear Sciences (1979), National Autonomous University of Mexico
Ph.D., Physics (1986), National Autonomous University of Mexico

Roberto. Uribe-Rendon's research interests are in the areas of radiation effects in materials, as well as in radiation measurements and standards specifically in the development of techniques used to measure the energy absorbed by materials during electron beam irradiations. Work related to this area comprises experiments in the NEO Beam facility for several research institutions as well as private companies interested in studying the effects of radiation in semiconductor and solar cell materials for space applications as well as in food and polymeric materials.

Dr. Uribe-Rendon teaches 15 credit hours in the college each semester. He teaches the following required course in the proposed major, which is also required in other college programs:

- TECH 21021 Survey of Electricity and Electronics
- TECH 43096 Individual Investigation in Applied Science and Technology

Adam Zuckerman, M.Tech.

Position: Adjunct, College of Aeronautics and Engineering
Degrees: B.S., Technology (2008), Kent State University
M.Tech., Technology (2009), Kent State University

Adam Zuckerman is a prototyping specialist and is focused on developing intellectual property, modeling, simulation and prototyping. Over his 10 years of teaching at Kent State University, Mr. Zuckerman has developed content for Battelle Memorial Institute, 3rd Frontier, NASA and many departments at Kent State University. He also focuses on developing properties for small businesses related to small business manufacturing and has led efforts at Kent State's small business development centers for over 14 years. In his roles, he involves students in taking the initial steps in creating documentation as part of creation process of intellectual property.

Mr. Zuckerman teaches 6-9 credit hours in the college each semester. He teaches the following required courses in the proposed major, which are also required in other college programs:

- TECH 13580 Engineering Graphics I
- TECH 23581 Computer-Aided Engineering Graphics

Kent State University

Fiscal Impact Statement

Enrollment Increase Associated with Change from Mechanical Engineering Technology Concentration to Mechanical Engineering Technology Major

	Year 1	Year 2	Year 3	Year 4
I. Projected Enrollment				
Headcount full-time	7	20	38	63
Headcount part-time	3	6	13	19
Full-time equivalent (FTE) enrollment	9	25	48	78
II. Projected Program Income				
Tuition (total for KSU)	$ 75,533	$ 211,913	$ 410,902	$ 671,602
Expected state subsidy (total for KSU)	$ 23,844	$ 66,895	$ 129,710	$ 212,006
Externally funded stipends, as applicable	$ -	$ -	$ -	$ -
Other Income	$ -	$ -	$ -	$ -
Total Projected Program Income	**$ 99,377**	**$ 278,808**	**$ 540,612**	**$ 883,608**
III. Program Expenses				
New personnel:				
- Instruction				
Full-time: 0 (but may share new full time under Mechatronics Engineering)				
Part-time: 0				
-Non-instruction				
Full-time: 0				
Part-time: 0				
Current personnel:				
- Instruction				
Full-time: Part of 1 to 13*	$ 3,219	$ 11,048	$ 53,126	$ 117,153
Part-time: Part of 2 to 7*	$ 1,622	$ 5,419	$ 12,386	$ 24,366
-Non-instruction				
Full-time: 0		$ -	$ -	$ -
Part-time: 0	$ -	$ -	$ -	$ -
Benefits for all personnel	$ 1,454	$ 4,967	$ 21,833	$ 47,704
New facilities/building/space renovation (describe in narrative below)	$ -	$ -	$ -	$ -
Scholarship/stipend support	$ -	$ -	$ -	$ -
Additional library resources	$ 100	$ 200	$ 300	$ 400
Additonal technology or equipment needs	$ 2,000	$ 4,000	$ 6,000	$ 8,000
Other expenses (see below)	$ 84,760	$ 226,852	$ 413,844	$ 652,497
Total Projected Program Expenses	**$ 93,154**	**$ 252,486**	**$ 507,489**	**$ 850,120**
Projected Program Net	**$ 6,223**	**$ 26,323**	**$ 33,123**	**$ 33,488**

Other Expenses				
Allocation of expenses covered by general fee	$ -	$ -	$ -	$ -
RCM overhead - estimated at 50%	$ 21,118	$ 60,840	$ 140,197	$ 249,719
RCM tuition+SSI allocation to other colleges (pays expenses of other colleges)	$ 57,142	$ 157,128	$ 260,218	$ 384,169
Professional development	$ 750	$ 2,383	$ 6,179	$ 10,608
Supplies (office, computer software, duplication, printing)	$ 500	$ 1,000	$ 1,500	$ 2,000
Telephone, network, and lines	$ 250	$ 500	$ 750	$ 1,000
Other info and communication pool	$ 5,000	$ 5,000	$ 5,000	$ 5,000
Total Other Expenses	**$ 84,760**	**$ 226,852**	**$ 413,844**	**$ 652,497**

BUDGET NARRATIVE:

[This section is for describing facilities, scholarship/stipend support, library resources, additional technology, etc., if applicable.]

This program is built around existing courses, so it will use existing facilities, library resources, equipment and technology with minor upgrades that are shared with existing programs.

The technology and equipment line is for consumables in the lab courses in this case.

A minor amount of marketing and promotion of this program are included under Other info and communications pool.

Allowances are provided for professional development, supplies, and telephone, network and lines.

Since this is a change from a concentration to a major, no targeted scholarship funds are included.

This evaluation considers the enrollment increase in an existing program only. So it will not have a substantial impact on the University's or College's net income. However, it will make contributions to the RCM overhead and funds flowing to other Colleges, which will also contribute to the RCM overhead (in year 4 the total contribution to RCM overheas will be approximately $440k).

* Faculty counts - Refer to Cost Calc by Course, and to Assumption 10.

MECHANICAL ENGINEERING TECHNOLOGY – B.S.
Student Learning Outcomes – Major Course Mapping

Major Course ID and Title	Student Learning Outcome 1: an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice. (ABET Outcome a)			Student Learning Outcome 2: an ability to apply knowledge of mathematics, science, and engineering (ABET outcome b)			Student Learning Outcome 3: an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability (ABET Outcome d)		
	Introduced	Reinforced	Mastered	Introduced	Reinforced	Mastered	Introduced	Reinforced	Mastered
TECH20002 Materials and Processes	✓			✓					
TECH21021 Survey of Electricity and Electronics	✓				✓		✓		
TECH33033 Hydraulics/ Pneumatics		✓			✓		✓		
TECH33031 Programmable Logic Controllers	✓			✓			✓		
TECH33111 Strength of Materials	✓				✓		✓		
TECH33363 Metallurgy and Materials Science	✓				✓		✓		
TECH34002 Advanced Computer-Aided Design II			✓	✓					✓
TECH36200 Programming for Engineers II		✓			✓				
TECH43550 Computer-Aided Manufacturing		✓		✓					
TECH43580 Computer-Aided Machine Design			✓			✓			✓
TECH43800 Applied Engineering Technology Seminar			✓						✓

Summary of Program Assessment Plan

1. PROGRAM MISSION

The mission of the Mechanical Engineering Technology program is to provide a high quality undergraduate education to prepare students for a successful career in mechanical engineering technology areas including computer-aided modeling and design, product and machine design, manufacturing, automation, pneumatics and hydraulics, metallurgy and materials, and energy and power.

2. STUDENT LEARNING OUTCOMES:

Student Learning Outcome 1: an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Method of Assessment: This learning outcome is assessed in required course TECH34002 Advanced Computer-Aided Design II Students use 3D CAD software and Finite Element Analysis to design a component with minimum mass while meeting certain design restrictions.

Achievement Target: A minimum 70 percent of the students must earn a B grade or better on the assignment for the learning objective to be met.

Method of Assessment: This learning outcome is assessed in required course TECH 43550 Computer-Aided Manufacturing. Students design a component, write the CNC code to mill that component, then use a CNC mill to create the component.

Achievement Target: A minimum 70 percent of the students must earn a B grade or better on the assignment for the learning objective to be met.

Student Learning Outcome 2: an ability to apply knowledge of mathematics, science, and engineering.

Method of Assessment: This learning outcome is assessed in required course TECH21021 Survey of Electricity and Electronics, in which students learn how to solve electrical circuits involving components connected in series, parallel, and in combination circuits. Students will learn how to use Kirchhoff's circuit laws in the solution of those problems and practice reduction techniques of the equations given by these laws. Methods of assessment will consist of a combination of quizzes and exams including problems related to electrical circuits from the course textbook and laboratory measurements in the electronics laboratory in which the students will have to construct an electrical circuit from an electrical diagram and then perform measurements using a DMM and an oscilloscope.

Achievement Target: The achievement target is that by the end of the course at least 90% of the students will know how to solve a series-parallel network and are familiar making electrical measurements using a DMM, the function generator, and the oscilloscope. These will be tested in a final oral exam.

Method of Assessment: This learning outcome is assessed in required course TECH 43580 Computer-Aided Machine Design. Students design shafts, gears, springs, fastened joints, clutches and brakes.

Achievement Target: Students should demonstrate conceptual and practical competence of design ability by the end of the course. A minimum 70 percent of the students must earn a B grade or better in the course for the learning objective to be met.

Student Learning Outcome 3: an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.

Method of Assessment: This learning outcome is assessed in required course TECH43580 Computer-Aided Machine Design. Students design shafts, bearings, gears, springs, fasteners, clutches, and brakes to meet design criteria.

Achievement Target: Students should demonstrate conceptual and practical competence by the end of the course. A minimum 70 percent of the students must earn a B grade or better in the course for the learning objective to be met.

Method of Assessment: This learning outcome is assessed in required course TECH 43800 Applied Engineering Technology Seminar. This course provides students with the opportunity to work in a team to complete a capstone project of the program. The students are formed in a team of three to four students to accomplish the following tasks: project idea generation and selection, project plan, design specification using House of Quality, market and patent search, cost estimate, project timeline, individual work assignments, concept generation and evaluation, analysis and synthesis, detailed design using CAD, part selection and purchase, prototype construction and test, project report writing and project oral presentation. The course instructor assesses students' weekly individual progress reports, the team written final report and the team oral project presentation.

Achievement Target: Students should demonstrate conceptual and practical competence of design ability by the end of the course. A minimum 70 percent of the students must earn a B grade or better in the course for the learning objective to be met.

3. ASSESSMENT RESULTS:
Describe how assessment results will be used for future program improvement (how and by whom results are reviewed and analyzed and how resulting plan of action will be implemented).

Assessment on these three learning outcomes will be conducted biennially. Results will be presented to the faculty, the appropriate industrial advisory boards, the program director, and the dean. Faculty will use the results to guide curricular development.