**NEW**

PROGRAM PROPOSAL

WEBER STATE UNIVERSITY

**Submission Date:** March 4, 2014

**College:** College of Applied Science and Technology

**Department**: Engineering Technology

**Program Title:** Mechatronics Technology

**1. Complete Program Description**

The Mechatronics Technology program prepares graduates to work in industry as qualified technicians in an automated manufacturing production environment. Students in the Mechatronics Technology program will develop skills in electronics, mechanics, pneumatics, automated control systems, product design and development drawings as well as geometric dimension and tolerance. They will have a foundation in machining and metal formation, casting, and welding. The Mechatronics Technology program is an interdisciplinary collaboration between manufacturing, design, electronics engineering technology. The AS Mechatronics Technology degree is designed for individuals interested in plant maintenance, installation and support of automated equipment, and manufacturing assembly processes.

**2. Purpose of Degree**

The Mechatronics Technology AS degree will satisfy local employers who need qualified technicians in their automated manufacturing plants to install, maintain, and repair highly automated equipment.

**3. Institutional Readiness**

The Engineering Technology Department is fully prepared for the Mechatronics Technology program and all resources are currently available. No additional courses or curriculum will need to be developed for the program. The Engineering Technology department is combining courses from three existing programs (DET, EET, and MfET) to create the new Mechatronics Technology program.

Students can follow a pathway from the OWATC to Weber State University to complete the Mechatronics Technology program. Four of the eight technical courses required for the Mechatronics Technology AS degree are currently have an articulation between OWATC and Weber State University.

The Mechatronics Technology program would result in an increase in enrollment in the DET, EET, and MfET courses.

**4. Faculty**

No additional faculty will be required for the Mechatronics Technology program. The courses are already developed and taught regularly. It will result in an increase in enrollment in the specific DET, EET, and MfET courses.

**5. Staff**

No additional staff will be required.

**6. Library and Information Resources**

No additional Library resources will be required since all courses are existing courses.

**7. Admission Requirements**

No special admission or application requirements are needed for this program.

**8. Student Advisement**

All Electronics Engineering Technology students are required to meet with their faculty advisor at least annually for course and program advisement.  Please call the department secretary at 801-626-6305 to schedule an appointment.

**9. Justification for Graduation Standards and Number of Credits**

The AS Mechatronics Technology degree requires a minimum of 60 credit hours.

Refer to [Degree and General Education Requirements](http://catalog.weber.edu/content.php?catoid=6&navoid=996) for Associate of Science requirements.

**10. External Review and Accreditation**

*Indicate whether any external consultants, either in- or out-of-state, were involved in the development of the proposed program, and describe the nature of that involvement. For a career and technical education program, list the members and describe the activities of the program advisory committee. Indicate any special professional accreditation which will be sought and how that accreditation will impact the program. Project a future date for a possible accreditation review; indicate how close the institution is to achieving the requirements, and what the costs will be to achieve them.*

**11. Projected Enrollment**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Year | Student Headcount | # of Faculty | Student-to-Faculty Ratio | Accreditation Req’d Ratio |
| 1 | 2 | 0 | 16:1 |  |
| 2 | 4 | 0 | 18:1 |  |
| 3 | 6 | 0 | 20:1 |  |
| 4 | 6 | 0 | 20:1 |  |
| 5 | 6 | 0 | 20:1 |  |

**12. Expansion of Existing Program**

*If the proposed program is an expansion or extension of an existing program, present enrollment trends by headcount and by student credit hours (if appropriate) produced in the current program for each of the past five years for each area of emphasis or concentration.*

**Need**

**13. Program Need**

*Clearly indicate why such a program should be initiated.*

The Mechatronics Technology AS degree will satisfy local employers who need qualified technicians in their

automated manufacturing plants to install, maintain, and repair highly automated equipment. The development of the AS Mechatronics Technology degree was in response to discussions with industry advisory board members (both MFET and EET) who requested capable graduates possessing both electrical and mechanical knowledge and skills.

**14. Labor Market Demand**

*Include local, state, and national data, and job placement information, the types of jobs graduates have obtained from similar programs. Indicate future impact on the program should market demand change.*

There is a large demand for electro/mechanical technicians in our community as well as on the state and national level. Graduates from a two-year Mechatronics Technology program obtain positions as:

Automation engineering technicians

Electro-mechanical technicians

Designers

Field service technicians

Industrial engineer technicians

Product support technicians

Inspectors

Machinists

Test technicians

Electrical/Mechanical drafters

Found online at <http://jobs.utah.gov/> on March 4, 2014

|  |  |  |  |
| --- | --- | --- | --- |
| Electrical / Electronic |  |  |  |
|  | Current | Annual Openings | Projected |
| Utah | 2130 | 50 | 2240 |
| National | 151,100 | 3180 | 154,000 |
|  |  |  |  |
| Mechanical |  |  |  |
| Utah | 1040 | 20 | 1100 |
| National | 44900 | 640 | 46700 |
|  |  |  |  |
| Electro / Mechanical |  |  |  |
| Utah | na | na | na |
| National | 16400 | 320 | 16500 |

**15. Student Demand**

*Describe evidence of student interest and demand that supports potential program enrollment.*

Many current EET and MFET students take additional courses in ET disciplines to enhance their education. They have requested a cross-discipline program that would increase their marketability. Students from OWATC are very interested in obtaining a technical degree as an extension of their certifications.

**16. Similar Programs**

*Are similar programs offered elsewhere in the state or Intermountain Region? If yes, cite justifications for why the Regents should approve another program. How does the proposed program differ from similar program(s)? Be specific.*

UVU offers a AAS Mechatronics and U of U offers a Mechanical Engineering certificate available for upper division Mechanical Engineering students only.

**17. Collaboration with and Impact on Other USHE Institutions**

*Describe discussions with other USHE institutions that are already offering the program that have occurred regarding your institution’s intent to offer the proposed program. Include any collaborative efforts that may have been proposed. Analyze the impact that the new program would have on other USHE institutions.*

SLCC offers an AAS EET, Electronics Technician certificate, AS Mechanical Engineering and Manufacturing Engineering. We currently collaborate with SLCC in the EET program to provide a pathway for students that complete the AAS EET to pursue the BS EET.

**18. Benefits**

*State how the institution and the USHE benefit by offering the proposed program.*

The Mechatronics Technology program would provide students a pathway from the local ATCs and SLCC to obtain a 2 year degree.

**19. Consistency with Institutional Mission**

*Explain how the program is consistent with and appropriate to the institution’s Regents’ approved mission, roles, and goals.*

The AS Mechatronics Technology is consistent and appropriate with the mission statement that includes offering technical degrees. It also provides access to higher educational opportunities. Graduates of the Mechatronics Technology program would contribute to the economic level of the region.

**Program and Student Assessment**

*Program assessment and performance standards information, which is required for Regents’ review, will serve as information only during University Curriculum Committee review.*

**20. Program Assessment**

*State the goals for the program and the measures that will be used in the program assessment procedure to determine if goals are being met.*

**21. Expected Standards of Performance**

*List the standards and competencies that the student will have met and achieved at the time of graduation. How or why were these standards and competencies chosen? Include formative and summative assessment measures you will use to determine student learning***.**

**Program Curriculum**

**22. All Program Courses**

*List all courses, including new courses, to be offered in the proposed program by prefix, number, title, and credit hours.*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| |  | | --- | | Mechatronics Technology (AS) | |  |   **Grade Requirements:** A grade of “C” or better in all DET, MFET, EET and support courses (a grade of “C-” is not acceptable). Students must have an overall GPA of 2.5 or higher to graduate.  **Credit Hour Requirements:**A minimum of 60 credit hours is required with a minimum of 25 credit hours in the major. Transfer students are required to take a minimum of 20 credit hours at Weber State University. Advisement All Engineering Technology students are required to meet with their faculty advisor at least annually for course and program advisement.  Please call the department secretary at 801-626-6305 to schedule an appointment. Admission Requirements See the department secretary to declare your program of study (major - see [Enrollment Services and Information](http://catalog.weber.edu/content.php?catoid=7&navoid=1243#Program_of_Study__Major_Minor__Declaration)). No special admission or application requirements are needed for this program. General Education Refer to [Degree and General Education Requirements](http://catalog.weber.edu/content.php?catoid=7&navoid=1244) for Associate of Science requirements. Consult with your advisor for specific general education guidelines. | | |
| Course Requirements for Mechatronics Technology AS DegreeRequired Engineering Technology Courses (25 credit hours)  * [EET 1850 - Industrial Electronics](http://catalog.weber.edu/preview_program.php?catoid=2&poid=417&returnto=610) **(4)** * [EET 1140 - DC Circuits](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2576&returnto=1228) **Credits:** **(3)** * [EET 2010 - AC Circuits](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2576&returnto=1228) **Credits:** **(3)** * [EET 2170 - Industrial Controls](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2576&returnto=1228) **Credits:** **(3)** * [DET 1060 - Fundamentals of Mechanical Drafting Using 3D CAD](http://catalog.weber.edu/preview_program.php?catoid=2&poid=417&returnto=610) **Credits:** **(3)** * [DET 1160 - Geometric Dimensioning & Tolerancing Using 3D CAD](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2864) **Credits:** **(3)** * [MFET 1210 - Machining Principles Lecture/Lab I](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2864) **Credits:** **(3)** * [MFET 2150 - Metal Forming, Casting and Welding](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2864) **Credits:** **(2)** and * [MFET 2150L - Metal Forming, Casting & Welding Lab](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2864) **Credits:** **(1)**  Required Support Course (6 credit hours)  * [CHEM 1010 PS - Introductory Chemistry](http://catalog.weber.edu/content.php?catoid=7&navoid=1244) **Credits:** **(3)** * [PHYS 1010 PS - Elementary Physics](http://catalog.weber.edu/content.php?catoid=7&navoid=1244) **Credits:** **(3)**  Required General Education Courses (9 credit hours)  * [COMM 2110 HU - Interpersonal and Small Group Communication](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2576&returnto=1228) **Credits:** **(3)** * [HIST 1700 AI - American Civilization](http://catalog.weber.edu/content.php?catoid=7&navoid=1244#tt8382) **Credits:** **(3)** * [ECON 1010 SS - Economics as a Social Science](http://catalog.weber.edu/preview_program.php?catoid=7&poid=2863) **Credits:** **(3)**  Note: Please note that there are additional General Education requirements to complete the degree. Suggested Course Sequence for the AS Mechatronics Technology Degree  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **COURSE** | **NAME** | **HRS** | **COURSE** | **NAME** | **HRS** | | MATH QL1030 | Contemporary Mathematics (or 1040, 1050, 1080, Pre-calculus | 3 | \* | Computer and Information Literacy exams/courses | 2/5 | | HU | Creative Arts or Humanities Elective | 3 | ENGL EN 2010 | Intermediate Writing | 3 | | HIST 1700 | American Institution | 3 | LS | Life Science Elective | 3 | | DET 1060 | CAD Drawing | 3 | DET 1160 | Geo Dim & Tol | 3 | | EET 1850 | Industrial Electronics | 4 | EET 1140 | DC Circuits | 3 | | **FALL FRESHMAN SEMESTER** | | **Total 16** | **SPRING FRESHMAN SEMESTER** | | **Total 14/17** | | CHEM PS1010 | Introductory Chemistry | 3 | ECON SS1010 | Economics as a Social Science | 3 | | COMM HU2110 | Intro to Interpersonal Comm. | 3 | CA | Creative Arts Elective | 3 | | PHSX PS 1010 | Elementary Physics | 3 | SS | Diversity Elective | 3 | | EET 2010 | AC Circuits | 3 | MFET 1210 | Machining Principles | 3 | | EET 2170 | Industrial Controls | 3 | MFET 2150 | Metal Form, Cast and Weld | 2 | |  |  |  | MFET 2150L | Metal Form, Cast, Weld Lab | 1 | | **FALL SOPHOMORE SEMESTER** | | **Total 15** | **SPRING SOPHOMORE SEMESTER** | | **Total 15** | | | |
| **Course Prefix & Number** | **Title** | **Credit Hours** |
| DET 1060 | CAD Drawing | 3 |
| EET 1850 | Industrial Electronics (Digital/Power/Motors) | 4 |
| DET 1160 | Geo Dim & Tol | 3 |
| EET 1140 | DC Circuits | 3 |
| EET 2010 | AC Circuits | 3 |
| EET 2170 | Industrial Controls | 3 |
| MFET 1210 | Machining Principles | 3 |
| MFET 2150 | Metal Form, Cast and Weld | 2 |
|  | Metal Form, Cast and Weld Lab | 1 |
|  | **Sub-Total** | 25 |
| **Elective Courses** |  |  |
| MATH QL1030 | Contemporary Mathematics 1040, 1050, 1080, Pre-calculus | 3 |  |
| PHSX PS/SI 1010 | Elementary Physics | 3 |
| Chem PS1010 | Introductory Chemistry | 3 |
| LS | Life Science Elective | 3 |
| COMM HU2110 | Intro to Interpersonal Comm. | 3 |
| HU/CA | Humanities or Creative Arts Elective | 3 |
| ECON SS1010 | Economics as a Social Science | 3 |
| HIST 1700 | American Institution | 3 |
| CA | Creative Arts Elective | 3 |
| SS | Diversity Elective | 3 |
| ENGL EN 2010 | Intermediate Writing | 3 |
| NTM 1700/1500 CIL\* | Computer and Information Literacy exams/courses | 2/5 |
|  | **Sub-Total** | 35 |
|  | **Total Number of Credits** | 60\* |

**TOTAL CREDITS: 60 min \*Computer and Information Literacy may be satisfied with exams or specific courses. See your advisor.**

**23. New Courses to be Added in the Next Five Years**

*List all new courses to be developed in the next five years by prefix, number, title, and credit hours. Use the following format:*

NA

Prefix & Number Title Credit Hours Course Description

**INFORMATION PAGE**

Did this program proposal receive unanimous approval within the Department? \_\_YES\_\_ If not, what are the major concerns raised by the opponents?

Explain how this program will differ from similar offerings by other departments. Also explain any effects this proposal will have on program requirements or enrollments in other departments including the Bachelor of Integrated Studies Program. In the case of similar offerings or affected programs, **you should include letters from the departments in question stating their support or opposition to the proposed program**.

NA

**A Master’s Degree program** must have a **minimum of 30 credit hours with a maximum of 36 credit hours**.

**A Bachelor** of Arts, Bachelor of Science, Bachelor of Fine Arts, Bachelor of Music, or Bachelor of Integrated Studies must have a **minimum of 120 credit hours with a program maximum of 126 hours** (This is a state system-wide requirement). Exceptions for the maximum number of program hours are allowed if accreditation issues require a set number of courses within a given program, i.e. Dental Hygiene, Nursing, Radiology**.**

**An Associate of Arts or an Associate of Science must have a minimum of 60 credit hours with a program maximum of 63 credit hours**. **An Associate of Applied Science must have a minimum of 63 credit hours with a program maximum of 69 credit hours.**

**Major programs that require a minor will consist of not fewer than 30 credits and not more than 48** credits in the major field. **Major programs that do not require a minor** shall consist of **not more than 63 credits in the major field.**

**A minor is a program** of study generally selected to complement and strengthen a student’s major and/or enrich the student’s overall educational program. **A minor consists of not fewer than 15 credits**. Courses that are used to satisfy the general education requirements can be used as part of the minimum number of hours needed for the minor requirements, unless prohibited by a particular college or department.

**Indicate the number of credit hours** for course work within the proposed program. (Do not include credit hours for General Education, SI, Diversity, or other courses unless those courses fulfill requirements within the proposed program.) \_\_40\_\_\_\_\_\_\_\_\_\_

**Submitting department will need to bring the original signed proposal(s) along with 22 copies to the Faculty Senate Office (MA210J), MC 1033, and an electronic copy to bstockberger@weber.edu**

**APPROVAL PAGE**

for: Mechatronics Technology

(Program Title)

X The WSU Library has adequate information resources to support this proposal.

\_\_\_\_\_ Currently, the WSU Library does not have adequate information resources to support this program. However, if this proposal is approved, a Library bibliographer will work closely with departmental faculty to acquire the information resources needed. Funding for the new resources will come from the Library’s budget.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ WSU Librarian/Date (Must be signed by the Library)

Approval Sequence:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Department Chair/Date (& BIS Director if applicable)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

College Curriculum Committee/Date

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Program Director or ATE Director (if applicable)/Date

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Dean of College/Date

|  |
| --- |
| Programs leading to secondary undergraduate teacher certification must be approved by the University Council on Teacher Education before being submitted to the Curriculum Committee.  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  University Council on Teacher Education/Date |

|  |
| --- |
| Master’s programs must be reviewed by the University Graduate Council before being submitted to the Curriculum Committee.  I have read the proposal and discussed it with the program director .  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  University Graduate Council Representative/Date |

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ University Curriculum Committee/Date

Passed by Faculty Senate \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Effective Semester\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_