

North Central Missouri College Curriculum Revision Proposal

Cover Sheet

Change Requested: (Check each box that applies and complete the indicated pages)

Complete pages 2, and pages 4 through 10

☒ New program

☐ New certificate ☐ Title IV eligible certificate (Financial Aid)

Parent program

Complete pages 2 and 3

☐ New course

Complete pages 2 and 11

☐ Program change

Complete page 2

☐ Title change

☐ Program

☒ Course

Current title

Proposed title

☐ Subtitle

for Course title

☐ Delete course from

☐ Catalog

☐ Taxonomy

☐ Delete program from

☐ Catalog

☐ Approved offerings

☐ Change course content

☐ Change credit hours

☐ Current

☐ New

☐ Change program entrance requirements

☐ Change course prerequisites

Course Delivery format: (check all that apply)

☒ On-site ☒ Off-Site ☒ On-line ☐ Blended ☐ ITV

☒ 50% or more of the courses required for the program or certificate will be offered off- site, online, ITV or blended format. (Requires 90 day prior approval by HLC)

☒ 50% or more of the required courses for this certificate were created specifically for this certificate, and are not a subset of an existing degree.

Program / Course Name: Industrial and Energy Systems Technology

Anticipated effective date of change: Fall 2011

Proposed by Rustin Jumps

Date submitted 2-16-2011

Dean _____

Rationale:

1. Program/course title: Industrial and Energy Systems Technology
2. Reason for proposal

The purpose for the Industrial and Energy Systems Technology Program is to meet the increasing demands for alternative energy in the Northwest Missouri Region. The career paths in “Green Energy” are expanding, and this program will help meet the growing demand in wind, solar, and bio-fuel technology, as well as industrial maintenance technology.

3. Transferability

The primary purpose for the Industrial and Energy Systems Technology Program is to prepare students for a career at the completion of the A.A.S. Degree. North Central Missouri College is working with Northwest Missouri State University for transferability to the Bachelor of Technology Degree.

Form NP

NEW PROGRAM PROPOSAL FORM

Sponsoring Institution(s): North Central Missouri College

Program Title: Industrial and Energy Systems Technology

Degree/Certificate: Associate of Applied Science
Industrial and Energy Systems
Technology Certificate

Options:

Delivery Site(s): North Central Missouri College – Trenton, MO

CIP Classification: 15.0503

Implementation Date: Fall 2011

Cooperative Partners: n/a

Expected Date of First Graduation: May 2013

AUTHORIZATION

Dr. Jamie Hooyman, Dean of Instruction

Name/Title of Institutional Officer	Signature	Date
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<u>Rustin Jumps, Agriculture Natural Resources Instructor</u>	<u>660-359-3948 ext. 1336</u>
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Person to Contact for More Information	Telephone
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2. NEED:

A. Student Demand:

North Central Missouri College sets forth in its mission to provide the opportunity for those in our education and business community to achieve their goals. It is important to meet individual and industry need by providing skills necessary for success. It is imperative these individuals attain and retain employment, have the opportunity for professional development and advancement, as well as the potential for furthering their education. This program provides a learning/training opportunity that does not currently exist for residents in this rural area. The target population is anyone who desires entry into a technical skill program or alternative energy program. (See Form SE)

B. Market Demand:

Industry and public research indicates the current and future need for technically skilled workers. Area industry representatives have stated that the need will be greater when current employees begin to retire in the next five years. When combined with the current lack of potential replacements with skilled training, the need is magnified. MERIC's *Green Jobs Report* (2010) states that, statewide, the shortage of workers with knowledge/skills and a shortage of available training programs are two existing barriers for hiring more workers.

The proposed program will train students in skills using a multi-disciplinary technical approach. Local industries, such as automotive supply manufacturers, food product manufactures, and others, have communicated support for the proposed program.

C. Societal Need:

A changing state and national economy will create opportunities for technically skilled workers. MERIC's *Green Jobs Report* (2010) identifies energy production, manufacturing, and farming as three of the six sectors of Missouri's green economy. Employees with skilled training are currently needed, and the need will be greater as the current workforce experiences retirements and position advancements.

In northwest Missouri, research indicates employment in two of the fastest growth industries will be repair and maintenance positions, increasing from 961 to 1,157 (+20.4%), and professional, scientific, and technical services positions, increasing from 2,165 to 2,688 (+24.2%) from 2008-2018. Thirty seven percent (37%) of green employers indicate alternative energy as a critical knowledge and skill set for Missouri's green economy.

Many of the major regional employers confirm their concern for the large amount of expected retirement in the near future. As new technologies are incorporated and embedded in nearly every job, it is imperative the future workforce has training that addresses the latest technological advancements and skill sets. This program is also designed with continuing education and stackable credentials in mind. Licenses, certifications, and two year degrees will be offered, thereby providing an avenue for an

individual to reach his/her professional development goals and, ultimately, his/her earning potential.

The program design will allow a working individual seeking additional training in a particular skill the opportunity to take a single course or allow an individual to pursue a certificate or degree full-time. The program will also complement the training an individual might receive at an area technical school/career center by offering higher level and more specific technical training.

D. Methodology used to determine B & C.

The methodologies used to determine market demand and societal need were national multi-media coverage, Missouri Economic Research & Information Center data and document review, industry focus group input, direct communication and surveys of area employers and secondary and postsecondary educators in the North Central Missouri College sixteen-county service region, as well as experience and observation.

Form SE

STUDENT ENROLLMENT PROJECTIONS

Year	1	2	3	4	5
Full Time	7	9	10	11	11
Part Time	2	2	3	4	4
Total	9	11	13	15	15

3. DUPLICATION AND COLLABORATION:

There currently is no Associate of Applied Science Degree offered in northwest Missouri in the Industrial and Energy Systems Technology Program. The Training of Tomorrow Grant, awarded to North Central Missouri College in 2010, has initiated the development of the program in collaboration with the current North Central Missouri College Agriculture and Natural Resources program. The plans include the utilization of new facilities at the Barton Farm Campus.

North Central Missouri College and Northwest Missouri State University have established an articulation agreement allowing the seamless transfer of the A.A.S. Degree in Industrial and Energy Systems Technology to the Bachelor of Technology Degree at Northwest Missouri State University.

4. Form PS

PROGRAM STRUCTURE

A. Total credits required for graduation: 62-64 (Depending on Emphasis Area)

B. Residency requirements, if any: 15 credit hours will be completed with NCMC

C. General education: Total credits: 16

Courses (specific courses OR distribution area and credits):

BT160 Microcomputer Applications	Credit 3
EN101 English I	Credit 3
HI103 American History or PL216 National Government	Credit 3
SP175 Speech	Credit 3
MT110 Intermediate Algebra	Credit 3
BT240 Employment Strategies	Credit 1

D. Major requirements: Total credits: 46-48 (Depending on Emphasis Area)

Emphasis Area: Alternative Fuels: Total Credits: 46

CH107 Introduction to Chemistry	Credit 4
BI100 General Biology	Credit 5
EC223 Agriculture Economics	Credit 3
AG105 Plant Science	Credit 3
AG106 Plant Science Lab	Credit 1
AG114 Crop Science	Credit 3
MF141 Programmable Logic Controllers	Credit 3
MF220 AutoCAD I	Credit 3
IExxx Biomass Crops	Credit 3
IExxx Introduction to Biofuels	Credit 3
IExxx Biodiesel Production	Credit 3
IExxx Bioethanol Production	Credit 3
IExxx Biogas Production	Credit 3
IExxx Biofuel Systems Technology	Credit 3
IExxx Biofuel Technology Internship	Credit 3

Emphasis Area: Solar: Total Credits: 48

PS108 Introduction to Physics	Credit 4
MF120 Introduction to Electronics	Credit 3
MF122 Basic Electricity I	Credit 3
MF126 Basic Electricity II	Credit 3
CT107 Materials of Construction	Credit 2
CT195 Residential Plumbing	Credit 3
MF141 Programmable Logic Controllers	Credit 3
MF220 AutoCAD I	Credit 3
IExxx Introduction to Solar	Credit 3
IExxx Passive Solar	Credit 3
IExxx Passive Solar Lab	Credit 2
IExxx Solar Thermal Systems	Credit 3
IExxx Solar Thermal Systems Lab	Credit 2
IExxx Solar Electrical Systems	Credit 3

IExxx Solar Electrical Systems Lab	Credit 2
IExxx Industry Standards	Credit 3
IExxx Solar Technology Internships	Credit 3

Emphasis Area: Wind: Total Credits: 46

PS108 Introduction to Physics	Credit 4
MF120 Introduction to Electronics	Credit 3
MF122 Basic Electricity I	Credit 3
MF126 Basic Electricity II	Credit 3
CT107 Materials of Construction	Credit 2
MF150 Principles of Safety	Credit 3
MF141 Programmable Logic Controllers	Credit 3
MF220 AutoCAD I	Credit 3
MF155 Principles of Maintenance	Credit 3
MF145 Basic Fluid Power	Credit 3
IExxx Introduction to Wind	Credit 3
IExxx Turbine Troubleshooting	Credit 3
AGxxx Agriculture Mechanics	Credit 4
IExxx Industry Standards	Credit 3
IExxx Wind Turbines and Farms Internship	Credit 3

Emphasis Area: Industrial Maintenance: Total Credits: 47

PS108 Introduction to Physics	Credit 4
BA150 Principles of Management	Credit 3
MF120 Introduction to Electronics	Credit 3
MF122 Basic Electricity I	Credit 3
MF126 Basic Electricity II	Credit 3
MF128 Motor Controls	Credit 3
MF150 Principles of Safety	Credit 3
MF141 Programmable Logic Controllers	Credit 3
MF220 AutoCAD I	Credit 3
MF235 Industrial Robotics	Credit 3
MF145 Basic Fluid Power	Credit 3
MF201 Industrial Electronics	Credit 3
IExxx Industry Standards	Credit 3
AGxxx Agriculture Mechanics	Credit 4
IExxx Industrial Maintenance Technology Internship	Credit 3

Industrial and Energy Systems Technology Certificate Requirements:

Emphasis Area: Solar: Total Credits: 28

SP175 Speech	Credit 3
MT110 Intermediate Algebra	Credit 3
BT240 Employment Strategies	Credit 1
MF122 Basic Electricity I	Credit 3
IExxx Introduction to Solar	Credit 3
IExxx Passive Solar	Credit 3
IExxx Passive Solar Lab	Credit 2
IExxx Solar Thermal Systems	Credit 3
IExxx Solar Thermal Systems Lab	Credit 2
IExxx Solar Electrical Systems	Credit 3
IExxx Solar Electrical Systems Lab	Credit 2

Emphasis Area: Wind: Total Credits: 25

SP175 Speech	Credit 3
MT110 Intermediate Algebra	Credit 3
BT240 Employment Strategies	Credit 1
MF120 Introduction to Electronics	Credit 3
MF122 Basic Electricity I	Credit 3
MF126 Basic Electricity II	Credit 3
IExxx Introduction to Wind	Credit 3
IExxx Turbine Troubleshooting	Credit 3
IExxx Wind Turbines and Farms Internship	Credit 3

Emphasis Area: Industrial Maintenance: Total Credits: 25

SP175 Speech	Credit 3
MT110 Intermediate Algebra	Credit 3
BT240 Employment Strategies	Credit 1
MF120 Introduction to Electronics	Credit 3
MF122 Basic Electricity I	Credit 3
MF128 Motor Controls	Credit 3
MF150 Principles of Safety	Credit 3
MF141 Programmable Logic Controllers	Credit 3
MF145 Basic Fluid Power	Credit 3

E. Free elective credits: Not Applicable (Sum of C, D, and E should equal A.)

F. Requirements for thesis, internship or other capstone experience:

Students completing internships will be required to complete a portfolio documenting their experience. Included in the portfolio will be place of internship, hours, description of duties, and educational and career goals. Students will also develop a plan of completion, which will include short term goals for the internship based on specified student learning objectives. Students will also be required to complete exit interviews for the degree program.

G. Any unique features such as interdepartmental cooperation:

This program will utilize the existing resources of the NCMC academic departments, as well as the required addition of one new full-time instructor. The unique opportunity to work interdepartmentally between this program and the agriculture department will be a valuable asset. The Barton Farm Campus Residence Center will be available to enhance the learning experience of students in the program. Students will have access to state-of-the-art simulation equipment at the Barton Campus to prepare them to enter an advanced technological workforce.

6. Form PG

PROGRAM CHARACTERISTICS AND PERFORMANCE GOALS

Institution Name: North Central Missouri College

Program Name: Industrial and Energy Systems Technology

Date: 11/22/10 – Program Projected Start Date – Fall 2011

(Although all of the following guidelines may not be applicable to the proposed program, please carefully consider the elements in each area and respond as completely as possible in the format below. Quantification of performance goals should be included wherever possible.)

Student Preparation

- There are no participant requirements or procedures in existence for this program that are outside normal institutional requirements or procedures.
- The majority of the students will be full time students interested in meeting the needs of the growing demand for careers in Renewable Energy and Industrial Maintenance.

Faculty Characteristics

- Faculty will meet the standards of North Central Missouri College and established qualifications for teaching the courses to which they are assigned.
- The approval of the Industrial and Energy Systems Technology Program will require new full-time faculty to be hired. The need may arise for a part-time instructor to teach a specialized course.
- The NCMC Program Department Chair is expected to participate in all NCMC professional activities, special student contact, and teaching/learning innovation as a full-time faculty member.

Enrollment Projections

- An estimated 11 full-time education majors will be in the program by the end of five years.
- An estimated 73% full-time enrollment and 27% part-time enrollment will be in the program by the end of five years.

Student and Program Outcomes

- The program will have seven graduates per annum after three years of implementation and 11 graduates after five years of implementation.
- Students will have the opportunity to receive specialized training in their specific emphasis area: alternative fuels, wind, solar or industrial maintenance.
- Students will have the opportunity to obtain certain industry licenses, registration and/or certifications to go along with the program.
- Students will be subject to graduation requirements of the College.
- Students will be expected to seek outside certifications or licensure from an outside accrediting body.
- The program is expected to provide students with 100% career placement or further educational opportunities.

Program Accreditation

- North Central Missouri College is an accredited public institution. Future and continued accreditation is anticipated. The program will be accredited by The Missouri Coordinating Board for Higher Education and The Higher Learning Commission.

Alumni and Employer Survey

- Graduate Follow-up Surveys are completed annually. The expected satisfaction rate is 90% or greater.
- Employer Surveys are completed annually with feedback from the program advisory committee. Results of the employer surveys will reflect a high satisfaction rate of 90% or greater.

Form OS

OFF-SITE DELIVERY OF AN EXISTING PROGRAM FORM

Sponsoring Institution (s): North Central Missouri College

Name of Institution (Campus or off-campus residential center in the case of multi-campus institutions).

Program Title: Industrial and Energy Systems Technology

Degree/Certificate: Associate of Applied Science

Industrial and Energy Systems Technology Certificate

Institution Granting Degree: North Central Missouri College

Delivery Site(s): Barton Farm Campus Residence Center

Mode of Program Delivery: Classroom and Laboratory

Geographic Location of Student Access: Trenton, Missouri

CIP Classification: 15.0503

Implementation Date: Fall 2011

Semester and Year

Cooperative Partners: n/a

AUTHORIZATION

Dr. Jamie Hooyman, Dean of Instruction

Name/Title of Institutional Officer

Signature

Date

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Person to Contact for More Information

Telephone