



NEW PROGRAM PROPOSAL FORM

Sponsoring Institution(s): Missouri State University-West Plains

Program Title: Pre-Engineering

Degree/Certificate: Associate of Science

Options: n/a

Delivery Site(s): Missouri State University-West Plains

CIP Classification: 15.9999

*CIP code can be cross-referenced with programs offered in your region on MDHE's program inventory [higher.ed.mo.gov/Program Inventory/search.jsp](http://higher.ed.mo.gov/Program%20Inventory/search.jsp)

Implementation Date: September 2015

Cooperative Partners: n/a

*If this is a collaborative program, form CL must be included with this proposal

AUTHORIZATION:

Dennis Lancaster/Dean of Academic Affairs

Name/Title of Institutional Officer	Signature	Date
Cathy Proffitt Boys	417-255-7278	
Person to Contact for More Information	Telephone	



STUDENT ENROLLMENT PROJECTIONS

Year	1	2	3	4	5
Full Time	5	6	7	8	9
Part Time	4	5	5	6	7
Total	9	11	12	14	16

Please provide a rationale regarding how student enrollment projections were calculated:

The enrollment projections are conservative. New programs typically take some time to become known to potential students so the anticipated enrollment in year one was set at 9 students. Enrollment in each subsequent year increases gradually after that. Missouri State University-West Plains, the South Central Career Center and the City of West Plains are committed to improving manufacturing opportunities in this region, with an advanced manufacturing initiative in the development stages. This should have a positive impact on interest in engineering fields.

Provide a rationale for proposing this program, including **evidence of market demand and societal need supported by research:**

Science, Technology, Engineering and Math (STEM) occupations will continue to experience above average job growth and job openings. These occupations are generally higher paying than average. On the MERIC "STEM Occupations Top Openings 2012-2022" report, four engineering occupations, Civil Engineering, Mechanical Engineering, Industrial Engineering and Electrical Engineering, appear in the list of 20 top opening STEM occupations. Engineering occupations will continue to be strong contributors to the economy in Missouri (http://www.missourieconomy.org/pdfs/stem_top_openings.pdf) The manufacturing industry area is a major employer of engineers and Manufacturing is a significant component of the economy in Missouri. In West Plains, six of the eight largest employers are manufacturing companies. (<http://www.westplains.net/uploads/EconDevBrochure.pdf>.) Input from area manufacturers indicate their interest and support of expanded academic opportunities in manufacturing to improve the skill set of potential local workers. The City of West Plains Economic Development Office has also expressed support for additional academic opportunities in manufacturing to help attract new manufacturing firms to the West Plains area. A partnership between Missouri State University-West Plains, the South Central Career Center and the City of West Plains to form an advanced manufacturing center is in the planning stages at this time. The proposed Associate of Science in Pre-Engineering fits well with this initiative. An increasing number of students from this area are pursuing engineering

www.dhe.mo.gov • info@dhe.mo.gov

205 Jefferson Street, P. O. Box 1469, Jefferson City, MO 65102 • (573) 751-2361 • (800) 473-6757 • Fax (573) 751-6635



degrees. This proposed degree will help those students interested in using A+ for their first two years of college select the correct courses to transfer to a four year engineering bachelors degree program. This program will also prepare students interested in other STEM fields as well.

PROGRAM STRUCTURE

A. Total credits required for graduation: 62

B. Residency requirements, if any: *Completion of last 15 credits in residence on the West Plains Campus or its extended campuses*

C. General education: Total credits: 23

Courses (specific courses OR distribution area and credits):

Course Number	Credits	Course Title
General Education Requirements		
IDS 110	2	Student Success
ECO 165 or ECO 155	3	Principles of Microeconomics or Principles of Macroeconomics
ENG 110	3	Writing I
COM 115 or ENG 210 or ENG 221	3	Fundamentals of Public Speaking or Writing II: Academic Writing or Writing II: Writing for the Professions
IDS 297	3	Topics in Globalization
PLS 101 or HST 121 or HST 122	3	American Democracy & Citizenship or Survey of US History to 1877 or Survey of US History since 1877
	17	
Humanities & Social Science Requirements (Select 2 courses)		
ART 200	3	Art in Context
FRN 101	3	Elementary French I
FRN 102	3	Elementary French II
GRM 101	3	Elementary German I
GRM 102	3	Elementary German II
GRY 100	3	World Regional Geography
HST 121	3	Survey of US History to 1877
HST 122	3	Survey of US History since 1877
MUS 241	3	The Language of Music
PHI 105	3	Logic, Language, and Argumentation
PHI 110	3	Introduction to Philosophy
PSY 121	3	Introductory Psychology
SPN 101	3	Elementary Spanish I
SPN 102	3	Elementary Spanish II
	6	

D. Major requirements: Total credits: 27

www.dhe.mo.gov • info@dhe.mo.gov

205 Jefferson Street, P. O. Box 1469, Jefferson City, MO 65102 • (573) 751-2361 • (800) 473-6757 • Fax (573) 751-6635



Course Number	Credits	Course Title
Engineering Requirements		
CHM 160	4	General Chemistry I
CHM 161	1	General Chemistry I Lab
CSC 125	4	Introduction to C++ Programming
MTH 261	5	Analytic Geometry & Calculus I
MTH 280	5	Analytic Geometry & Calculus II
MTH 292	3	Multivariate Calculus
PHY 203	5	Foundations of Physics I
PHY 204	5	Foundations of Physics II
	27	
Additional Requirements (Select 4 courses for a total of 12 credit hours)		
CGP 145	3	Introduction to Computer Programming
CIS 101	3	Computers for Learning
MTH 135	3	College Algebra
MTH 138	5	Pre-Calculus Mathematics
MTH 181	3	Trigonometry
TEC 299	3	Technology Internship
	1-3	Other BIO, CGP, CHM, CSC, MTH, PHY, or TEC courses approved by department/division
	12	

E. Free elective credits:

See the "additional requirements" section above.

(Sum of C, D, and E should equal A.)

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

Students complete one capstone class, IDS 297 Topics in Globalization. Students also have the option to complete the TEC 299 Technology Internship (120 contact hours) as an elective.

G. Any unique features such as interdepartmental cooperation:

The proposed AS in Pre-Engineering utilized courses from the math, chemistry, physics, computer science departments, in addition to other general education and technology departments.



Notes:

- Faculty salary and benefits are approximately 60% of tuition (50% salary + 10% benefits).
- Staff time is devoted to this program is estimated at 5% of one staff member.
- Basic student fee per credit hour is assumed at \$129, plus additional fees, with an estimated 3% increase per year.
- Full-time students are assumed to take 30 credit hours per academic year. Part-time students are assumed to take 15 credit hours per academic year.

PROGRAM CHARACTERISTICS AND PERFORMANCE GOALS

Institution Name Missouri State University-West Plains
Program Name Associate of Applied Science in Technology – Manufacturing Option
Date March 31, 2015

(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.)

1. Student Preparation

- Any special admissions procedures or student qualifications required for this program which exceed regular university admissions, standards, e.g., ACT score, completion of core curriculum, portfolio, personal interview, etc. Please note if no special preparation will be required.

Missouri State University-West Plains is an open admission campus. The proposed AS in Pre-Engineering has no special preparation required beyond the regular university admission requirements.

- Characteristics of a specific population to be served, if applicable.
Missouri State University-West Plains is located in the most rural and isolated region of the state and are the only public higher educational opportunities in the seven county service area. Of the total residents in the service area, 25 percent live at or below the poverty line. Less than nine percent of the service area population have achieved college degrees. Approximately three-fourths of the MSU-West Plains students are not prepared for college-level work as measured by placement assessment, forcing them to complete up to three remedial courses.

2. Faculty Characteristics

- Any special requirements (degree status, training, etc.) for assignment of teaching for this degree/certificate.

Full-time and part-time faculty are required to have completed a minimum of a masters degree in order to teach the courses required for this degree program.

www.dhe.mo.gov • info@dhe.mo.gov

205 Jefferson Street, P. O. Box 1469, Jefferson City, MO 65102 • (573) 751-2361 • (800) 473-6757 • Fax (573) 751-6635



- Estimated percentage of credit hours that will be assigned to full time faculty. Please use the term "full time faculty" (and not FTE) in your descriptions here.
Approximately 50% of the courses for this program may be taught by full-time faculty and 50% may be taught by per course faculty.
- Expectations for professional activities, special student contact, teaching/learning innovation.
Full-time faculty are strongly encouraged to pursue continuing education opportunities in their respective fields and to participate in professional organizations; professional development funds are provided by the university. All full-time faculty serve as student advisors.

3. Enrollment Projections

- Student FTE majoring in program by the end of five years.
Estimated FTEs = 12 students.
- Percent of full time and part time enrollment by the end of five years.
Estimated full-time enrollment = 56%; Estimated part-time enrollment = 44%



4. Student and Program Outcomes

- Number of graduates per annum at three and five years after implementation.
Estimated graduates at three years = 6; Estimated graduates at five years = 12
- Special skills specific to the program.
Students will acquire knowledge in calculus, physics, chemistry, computer science and other general education areas.
- Proportion of students who will achieve licensing, certification, or registration.
NA
- Performance on national and/or local assessments, e.g., percent of students scoring above the 50th percentile on normed tests; percent of students achieving minimal cut-scores on criterion-referenced tests. Include expected results on assessments of general education and on exit assessments in a particular discipline as well as the name of any nationally recognized assessments used.
Expected results on the ACT's Collegiate Assessment of Academic Proficiency (CAAP) to remain above the national average.
- Placement rates in related fields, in other fields, unemployed.
Estimated placement rate in related fields = 80%; Estimated placement rate in other fields = 20%
- Transfer rates, continuous study.
Estimated transfer and/or continuous study rate = 85%

5. Program Accreditation

- Institutional plans for accreditation, if applicable, including accrediting agency and timeline. **If there are no plans to seek specialized accreditation, please provide a rationale.**
The Higher Learning Commission of the North Central Association -- Fall 2014

6. Alumni and Employer Survey

- Expected satisfaction rates for alumni, *including timing and method of surveys.*
Graduate surveys will be conducted, via telephone, within six months of graduation.
- Expected satisfaction rates for employers, including timing and method of surveys.
Employers of program graduates will be surveyed, via telephone, within six months of graduation. A general survey of local employers will be conducted every two years, via written survey mailed to each employer, with at least 90% of employers responding will indicate satisfaction with the preparation of graduates.

www.dhe.mo.gov • info@dhe.mo.gov

205 Jefferson Street, P. O. Box 1469, Jefferson City, MO 65102 • (573) 751-2361 • (800) 473-6757 • Fax (573) 751-6635



7. Institutional Characteristics

- Characteristics demonstrating why your institution is particularly well-equipped to support the program.

Since 1963, Missouri State University-West Plains has successfully met the needs of its constituents in providing effective learning opportunities to students in liberal arts and transfer education. Since the mid-1990's, those opportunities were extended to programs in career and technical education. Since 1997, Missouri State University-West Plains and the South Central Career Center have cooperated in providing technical educational course offerings to students toward completion of an associates degree. With this proposed degree program Missouri State University-West Plains is striving to fulfill its mission to provide quality educational services to south central Missouri. Missouri State University-West Plains is an open admissions campus with 2,200 undergraduate students and is part of the Missouri State University multi-campus university system. As part of this multi-campus system, Missouri State University-West Plains students have bachelors-level transfer program opportunities on the West Plains campus, as well as the Springfield campus. Missouri State University-West Plains is also within 100 miles of two universities offering engineering bachelors degrees or higher.