



**NEW PROGRAM PROPOSAL FORM**

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**Sponsoring Institution(s):** St. Louis Community College

**Program Title:** Engineering Science

**Degree/Certificate:** Associate in Science

**Options:** Click here to enter text.

**Delivery Site(s):** Florissant Valley Campus and Meramec Campus

**CIP Classification:** 140102

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

**Implementation Date:** Summer 2015

**Cooperative Partners:** none

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

**AUTHORIZATION:**

Dr. Donna Dare, Vice Chancellor for Academic Affairs

*Donna Dare* 3/25/15

Name/Title of Institutional Officer

Signature

Date

Dr. Joyce Johnson, Director of Curriculum and Assessment

314-539-5162

Person to Contact for More Information

Telephone



**STUDENT ENROLLMENT PROJECTIONS**

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Year	1	2	3	4	5
Full Time	150	150	150	150	150
Part Time	200	200	200	200	200
Total	350	350	350	350	350

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

This program existed for many years as an AAS program before converting to an AS program in 2007. The program proposal was approved by the St. Louis Community College District Curriculum Committee and the Board of Trustees in 2007, but no evidence has been located that it was submitted and/or approved by the Missouri Department of Higher Education Coordinating Board for Higher Education. This submission is intended to rectify that situation. The numbers presented above are based upon past enrollment trends.

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

This program has been successfully delivered to students for many years as an AAS degree. Demand continues to increase for students in STEM fields. Community colleges prepare students for transfer to four-year institutions as well as careers that require associate level preparation. The Chronicle of Higher Education has documented this need (<http://chronicle.com/article/Work-Force-Demand-for-STEM/137231/>). The program at STLCC primarily prepares students for transfer to four-year baccalaureate institutions.



PROGRAM STRUCTURE

A. Total credits required for graduation: 69-71

B. Residency requirements, if any: Because much of the support for St. Louis Community College comes from state funds and local taxes, students who live within the service area of the college pay a small part of the cost of their education. The service area includes St. Louis City, St. Louis County and portions of Franklin and Jefferson counties which are part of the Meramec Valley R-3 School District and the Rockwood R-6 School District. Students may be required to submit an affidavit showing residency.

C. General education: Total credits: 29

Courses (specific courses OR distribution area and credits):

Course Number	Credits	Course Title
<b>I. General Education</b>		
ENG 101	3	College Composition I
ENG 102 (or)	3	College Composition II
ENG 103 (or)	3	Report Writing
ENG 203	3	American Literature
MTH 210	5	Analytic Geometry and Calculus I
CHM 105	5	General Chemistry I
PHY 122	5	Engineering Physics I
	3	Social Science Requirement
	3	Missouri State Requirement
<b>II. Physical Education Activity</b>	2	

D. Major requirements: Total credits: 31

Course Number	Credits	Course Title
<b>III. Area of Concentration</b>		
ESC 100	3	Engineering Computer Applications and Design
ESC 101 (or)	3	Scientific Computer Programming
IS 227	3	C Programming
ESC 200	4	Engineering Circuits I
ESC 203	3	Engineering Mechanics I
MTH 220	5	Analytic Geometry and Calculus II
MTH 230	5	Analytic Geometry and Calculus III
MTH 240	3	Differential Equations
PHY 223	5	Engineering Physics II

E. Free elective credits:

9-11

Course Number	Credits	Course Title
<b>IV. Engineering Electives</b>		Choose one course from the following list based on the engineering field to be pursued and the recommendation of the college to which transfer is expected.
ESC 201 (OR)	4	Engineering Circuits II
ESC 204 (OR)	3	Engineering Mechanics II
ESC 205 (OR)	3	Mechanics of Materials
ESC 207 (OR)	3	Engineering Thermodynamics
ESC 202	3	Thermal Analysis
<b>V. Technical and General Education Electives</b>		Completion of the AS degree in Engineering Science requires an additional six to seven credit hours selected from any of the courses listed in the following three categories. Elective courses should be selected based on the engineering field to be pursued, the recommendation of the college to which transfer is expected. Engineering and Related Electives:
EGR 100	3	Engineering Drawing
ESC 201	4	Engineering Circuits II
ESC 204	3	Engineering Mechanics II
ESC 205	3	Mechanics of Materials
ESC 206	1	Strength of Materials Lab
ESC 207 (or)	3	Engineering Thermodynamics
ESC 202	3	Thermal Analysis
ME 151	3	Manufacturing Processes I
ME 249	3	Materials and Metallurgy
CE 240	3	Surveying I
CE 243	3	Introduction to Environmental Engineering
QC 100	3	Introduction to Quality Control
SAF 100	3	Safety Program Organization and Administration
IS 256	3	C++ Programming
<b>Science and Mathematics Electives</b>		*Check with institution to which transfer is expected to determine course acceptability.
BIO 117 *	3	Conservation and Ecology
CHM 106	5	General Chemistry II
CHM 201	4	Quantitative Analysis I
CHM 206 (and)	3	Organic Chemistry Lecture I
CHM 210	2	Organic Chemistry Lab I
CHM 207 (and)	3	Organic Chemistry Lecture II
CHM 211	2	Organic Chemistry Lab II
GEO 111 *	5	Physical Geology
MTH 215	3	Linear Algebra
PHY 224	3	Engineering Physics III
<b>Recommended General Education Electives**:</b>		** Substitutions may be made with permission from an advisor.
ANT 103	3	Cultural Variations
ART 133	3	Graphic Design I
COM 101	3	Oral Communication I
ECO 151	3	Principles of Macroeconomics
HST 119	3	The Modern World

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HUM 112	3	Creative Thinking
PHL 111	3	Environmental Ethics
PSC 201	3	International Relations
PSY 200	3	General Psychology
PSY 206	3	Introduction to Social Psychology
PSY 217	3	Cross-Cultural Psychology
SOC 101	3	Introduction to Sociology
SOC 202	3	Social Problems

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

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

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G. Any unique features such as interdepartmental cooperation:

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## PROGRAM CHARACTERISTICS AND PERFORMANCE GOALS

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Institution Name      St. Louis Community College  
Program Name         Engineering Science  
Date      January 5, 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.

There are no special admissions to this program. Students may declare their interest at the time of enrollment at STLCC and advance according to their success in completing prerequisite, required and elective courses.

- Characteristics of a specific population to be served, if applicable.  
This program provides students with the first two years of study toward a Bachelor of Science degree at a four-year college or university. Students take fundamental courses common to most engineering disciplines and continue their studies in specialized areas (such as electrical, mechanical, civil, chemical, aerospace and nuclear) during the remaining years at four-year colleges or universities. Although some students transfer to colleges throughout the country over 90% of our graduates transfer to Missouri S&T, University of Missouri-Columbia (Mizzou), UMSL Washington University Joint Program or Southern Illinois University-Edwardsville.

### 2. Faculty Characteristics

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

Faculty should have a minimum of a Masters degree in an appropriate Engineering Field (or a Bachelor's degree for stand alone laboratory classes such as ESC:206)

- 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 85-90% of the program credit hours are assigned to full-time faculty for engineering courses. The percentage for prerequisite and required courses taught outside of

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the Engineering department, the figure may be slightly lower depending on the schedule a student chooses.

- Expectations for professional activities, special student contact, teaching/learning innovation.

Full-time faculty are expected to stay current in their field through some combination of participation in technical professional societies, educational societies or participation in conferences, seminars, instructional skills workshops, grants, summer employment, or other forms of approved professional development.

### 3. Enrollment Projections

- Student FTE majoring in program by the end of five years.

An estimate of 200 FTE students will be in the program by the end of 5 years.

- Percent of full time and part time enrollment by the end of five years.

50% full-time and 50% part-time

### 4. Student and Program Outcomes

- Number of graduates per annum at three and five years after implementation.

STLCC has averaged more than 17 graduates per year for the past five years; this trend is expected to continue.

- Special skills specific to the program.

At this level the program is primarily academic. The students will be able to apply mathematic calculus and scientific principles.

- Proportion of students who will achieve licensing, certification, or registration.

This is a transfer program that does not lead directly to licensing, certification or registration.

- 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.

Upon completion of this program, 75% of the students will be accepted to transfer to ABET accredited University Engineering programs. In the past five years, an average of 75% students have graduated with a 3.0 or higher grade point average.

- Placement rates in related fields, in other fields, unemployed.

N/A – Students transfer to baccalaureate institutions.

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- Transfer rates, continuous study.

Although graduation from St. Louis Community College continues to be a major success objective, it is not the only measure of success. The engineering program is designed for students to continue in baccalaureate institutions. For a variety of reasons many students choose to transfer successfully prior to completing an associates degree. For this reason, graduation rates are not the sole indicator of success and they don't necessarily track with transfer rates.

## 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.**

Other than HLC institutional accreditation, there is no specialized accreditation offered for an Associates Degree in Engineering Science. The organization primarily responsible for Engineering accreditation (Engineering Accreditation Commission of ABET) accredits only at the baccalaureate level.

## 6. Alumni and Employer Survey

- Expected satisfaction rates for alumni, *including timing and method of surveys.*

There are currently no satisfaction surveys for alumni in use for this program.

- Expected satisfaction rates for employers, including timing and method of surveys. Students transfer and do not go directly into employment. The appropriate satisfaction rate for this program would be success in the receiving institution.

## 7. Institutional Characteristics

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

St. Louis Community College works specifically with the Missouri University of Science and Technology, University of Missouri- Columbia, Washington University, Southern Illinois University- Edwardsville, UM-St. Louis/Washington University Joint Engineering Program, Parks College of St. Louis University and Rensselaer Polytechnic Institute to facilitate the transferability of specific courses. Students also transfer to other schools throughout the country on a case-by-case basis. For the most current information on transferability, please consult an academic advisor, the Engineering Department or the transfer institution's Web site. This program is designed to provide the necessary flexibility to meet the technical and general education requirements indicated in the receiving institution's transfer guidelines. (See Attached)