



PUBLIC

INDEPENDENT

NEW PROGRAM PROPOSAL FOR ROUTINE REVIEW

When finished, please save and email to: he.academicprogramactions@dhe.mo.gov

Sponsoring Institution:

Program Title: Power Generation Technology

Degree/Certificate:

If other, please list:

Options:

Delivery Site: State Technical College of Missouri, One Technology Drive, Linn, MO 65051

CIP Classification: 15.1702

Implementation Date: 8/24/2021

Is this a new off-site location? Yes No

If yes, is the new location within your institution's current CBHE-approved service region?

**If no, public institutions should consult the comprehensive review process*

Is this a collaborative program? Yes No

**If yes, please complete the collaborative programs form on last page.*

Please list similar or comparable programs at Missouri public institutions of higher education.

**For public institutions only*

There are no programs in the MDHEWD College and Degree Search / Program Inventory with a CIP code of 15.1702 Power Plant Technology/Technician. However, Ozark Technical Community College's Industrial Systems Technology AAS program with a CIP code of 47.0303 Industrial Mechanics and Maintenance Technology includes a Power Plant Option.

CERTIFICATIONS:

- The program is within the institution's CBHE approved mission. *(public only)*
- The program will be offered within the institution's CBHE approved service region. *(public only)*
- The program builds upon existing programs and faculty expertise
- The program does not unnecessarily duplicate an existing program in the geographically-applicable area.
- The program can be launched with minimal expense and falls within the institution's current operating budget. *(public only)*

AUTHORIZATION

Janet B. Clanton	<i>Janet B. Clanton</i>	9/30/2020
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Name/Title of Institutional Officer

Signature

Date

PROGRAM CHARACTERISTICS AND PERFORMANCE GOALS

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.
Due to the math skill requirements for this career and program, an ACT Mathematics score of at least 21, or the equivalent on other placement tests such as the Accuplacer-Next Generation, is required for student admission to this program in addition to the State Technical College of Missouri standard admissions requirements.
- Characteristics of a specific population to be served, if applicable.
Not applicable.

2. Faculty Characteristics

- Any special requirements (degree status, training, etc.) for assignment of teaching for this degree/certificate. State Tech's Board of Regents Employment Policies state that, "Technical faculty requirements are a minimum of a bachelor's degree in an appropriate area and three years of appropriate business/industrial experience." Technical faculty members are also required to obtain and maintain Career & Technical Educator certification by the Missouri Department of Elementary & Secondary Education.
- 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.
The estimated percentage of credit hours that will be taught by full-time faculty is 93%, which is based on full-time instructors teaching the core curriculum and program requirement classes and 80% of general education requirement classes.
- Expectations for professional activities, special student contact, teaching/learning innovation.
None planned at this time.

3. Enrollment Projections

- Student FTE majoring in program by the end of five years.
85 FTE students
- Percent of full time and part time enrollment by the end of five years.
80% full-time and 20% part-time

STUDENT ENROLLMENT PROJECTIONS

YEAR	1	2	3	4	5
Full Time	22	40	40	58	75
Part Time	6	10	10	14	19
Total	28	50	50	72	94

4. Student and Program Outcomes

- Number of graduates per annum at three and five years after implementation.
Based on State Tech’s current graduation rate of 73%, we project 20 graduates at three and five years after implementation.
- Special skills specific to the program.
The program will prepare students with plant operations skills for all power generation energy sources.
- Proportion of students who will achieve licensing, certification, or registration.
Not applicable.
- 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.
75% pass rate on end-of-program technical skill assessment. 90% pass rate on general education end-of-program assessment.
- Placement rates in related fields, in other fields, unemployed.
75% placement in related fields. 20% placement in other fields. 5% unemployed
- Transfer rates, continuous study.
0% immediately after graduation.

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 rationale.
The college will seek accreditation of the proposed program by the Association of Technology, Management, and Applied Engineering (<https://www.atmae.org/page/Accreditation>). An accreditation timeline will be developed after program faculty are hired.

6. Program Structure

A. Total credits required for graduation: 69

B. Residency requirements, if any:

The State Tech 2020-21 College Catalog states that, “To graduate from State Technical College of Missouri with an A.A.S. degree, a student is required to have earned a minimum of 32 credit hours in technical education from State Technical College of Missouri. The 32 credit hours in technical education must meet the requirements of the degree being sought.”

C. General education: Total credits:

19

Courses (specific courses OR distribution area and credits)

Course Number	Credits	Course Title
	3	Written Communication
	3	Oral Communication
	3	Mathematics
	4	Science with Lab
	3	Social Science
	3	Technical Literacy

D. Major requirements: Total credits: 50

Course Number	Credits	Course Title
PWR 105	3	Introduction to Energy Technology
PWR 110	3	Introduction to Electricity
PWR 115	3	Electrical Theory and Safety
PWR 120	3	Plant Equipment and Systems
PWR 130	3	Mechanical and Fluid Power Transmission
PWR 200	3	Operation, Troubleshooting, and Communications
PWR 205	3	Piping and Instrumentation Drawing
PWR 221	3	Power Generation Components and Protection
PWR 230	4	Internship
PWR 111	3	Water Purification and Treatment
PWR 125	3	Heat Transfer, Fluid Flow, and Thermodynamics
PWR 135	3	Applied Electronics for Industrial Automation
PWR 201	3	Steam Generation
PWR 203	3	Boilers and Environmental Protection
PWR 210	3	Turbines and Combined Cycle
PWR 215	3	Transformers, Industrial Motors, and Their Controls
COM 125	1	Job Search Strategies

E. Free elective credits: none

(sum of C, D, and E should equal A)

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

A four-credit PWR 230 internship course will be required and typically completed during the summer between the first and second years of the Power Generation Technology AAS program. Students will work approximately 320 hours with a power generation company. Students are expected to apply learned skills to be a productive employee. The employer is expected to place the student in an environment that will build on the student's first year of study and enhance the student's knowledge of working in the power generation industry.

G. Any unique features such as interdepartmental cooperation:

Prepares operators for plants using all energy sources.

7. Need/Demand

Student demand

Market demand

Societal demand

I hereby certify that the institution has conducted research on the feasibility of the proposal and it is likely the program will be successful.

On July 1, 2011, the Coordinating Board for Higher Education began provisionally approving all new programs with a subsequent review and consideration for full approval after five years.

COLLABORATIVE PROGRAMS – Not Applicable

- **Sponsoring Institution One:**
- **Sponsoring Institution Two:**
- **Other Collaborative Institutions:**
- **Length of Agreement:**
- **Which institution(s) will have degree-granting authority?**
- **Which institution(s) will have the authority for faculty hiring, course assignment, evaluation and reappointment decisions?**
- **What agreements exist to ensure that faculty from all participating institutions will be involved in decisions about the curriculum, admissions standards, exit requirements?**
- **Which institution(s) will be responsible for academic and student-support services, e.g., registration, advising, library, academic assistance, financial aid, etc.?**
- **What agreements exist to ensure that the academic calendars of the participating institutions have been aligned as needed?**

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POWER GENERATION TECHNOLOGY

Classification of Instructional Programs – 15.1702

Associate of Applied Science Degree

CORE CURRICULUM

			Credit Hours
PWR	105	Introduction to Energy Technology	3
PWR	110	Introduction to Electricity	3
PWR	115	Electrical Theory and Safety	3
PWR	120	Plant Equipment and Systems	3
PWR	130	Mechanical and Fluid Power Transmission	3
PWR	200	Operation, Troubleshooting, and Communications	3
PWR	205	Piping and Instrumentation Drawing	3
PWR	221	Power Generation Components and Protection	3
PWR	230	Internship	4
SUB-TOTAL			28

GENERAL EDUCATION REQUIREMENTS

		Written Communication	3
		Oral Communication	3
		Mathematics	3
		Science with Lab	4
		Social Science	3
		Technical Literacy	3
SUB-TOTAL			19

PROGRAM REQUIREMENTS

		PWR 111 Water Purification and Treatment	3
		PWR 125 Heat Transfer, Fluid Flow, and Thermodynamics	3
		PWR 135 Applied Electronics for Industrial Automation	3
		PWR 201 Steam Generation	3
		PWR 203 Boilers and Environmental Protection	3
		PWR 210 Turbines and Combined Cycle	3
		PWR 215 Transformers, Industrial Motors, and Their Controls	3
SUB-TOTAL			21

GRADUATION REQUIREMENTS

		COM 125 Job Search Strategies	1
SUB-TOTAL			1

It is a graduation requirement of the Power Generation Technology (PWR) program for students to earn a grade of “C” or better in all “Core Curriculum” and Program Requirements” courses.

PROGRAM TOTAL	69
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POWER GENERATION TECHNOLOGY AAS DEGREE PROGRAM STRUCTURE

As the 2020-21 school year started on August 25, State Tech had a total of 17 students enrolled and 50 students still in the enrollment funnel for our existing Nuclear Technology Associate of Applied Science program.

The United States Energy Information Administration's web pages, eia.gov/tools/faqs and eia.gov/beta/states/states/mo/overview, provide the following information:

- "In 2019, about 4,118 billion kilowatt hours (kWh) (or about 4.12 trillion kWh) of electricity were generated at utility-scale electricity generation facilities in the United States. About 63% of this electricity generation was from fossil fuels—coal, natural gas, petroleum, and other gases. About 20% was from nuclear energy, and about 18% was from renewable energy sources...
- Coal-fired power plants provided 73% of Missouri's electricity net generation in 2019, and more coal was consumed for generation in Missouri than in any other state except for Texas and Indiana.
- Missouri has 9 biodiesel plants with a combined annual production capacity of 247 million gallons, the third-largest in the nation.
- At the end of 2019, Missouri had about 1,000 megawatts of wind power generating capacity from 500 wind turbines, and nearly 900 additional megawatts of wind power was under construction."

Therefore, State Technical College of Missouri is proposing to add this Power Generation Technology program that is designed to prepare plant operators for all power generation energy sources vs. our current Nuclear Technology program that prepares plant operators only for Missouri's one nuclear plant.

The mode of delivery will be in the classroom.