Engineering and Industrial Technology-070
Academic Program Review

Based on the thorough internal or external program review addressing all criteria in policy, a comprehensive report should be possible within ten or fewer pages. This program review template is provided to assist institutions in compiling the program review information, which is to be presented to the institutional governing board prior to submission to the State Regents. Executive Summaries should be possible within two pages using the provided template (Program Review Executive Summary Template).

Description of the program's connection to the institutional mission and goals:

The mission of the college is given here:

Northern Oklahoma College, the State's oldest community college, is a multi-campus, land-grant institution that provides high quality, accessible, and affordable educational opportunities and services which create life-changing experiences and develop students as effective learners and leaders within their communities in a connected, ever-changing world.

The mission of the Engineering and Industrial Technology (E&IT) degree program is as follows:

To give students opportunities for career positions in chemical and refinery industry through providing a foundation in the principles and application of industrial processes developed in close partnership with industry.

Our E&IT graduates find life-changing opportunities in career positions in industry that allow them to better provide for their family and contribute to the community as a whole.

The goals of Northern Oklahoma College are listed below, along with the corresponding goals of the Engineering and Industrial Technology (E&IT) degree program:

Goal 1A: Enhance the quality of life for students.
Strategy 1: Enhance the quality of life for students.
Goal 1B: Enhance recruitment efforts as well as retention and graduation rates.
Strategy 2—Use student engagement survey to guide development of high-impact educational strategies.
Strategy 3—Increase online and evening course offerings/assisting underrepresented populations.
[E&IT program has moved to full evening offerings for all core PTEC classes and the required math and science courses.]
Strategy 4—Improve academic advisement model.
[E&IT director goal is to streamline advising to provide students with clear course plans when they enter the program and follow up with students who fall behind on their course plans.]

Goal 2: Cultivate and maintain partnerships to inform and improve academic decisions, enrich student experiences, and support regional needs.

Strategy 5--Cultivate and maintain partnerships to inform and improve academic decisions, enrich student experiences, and support regional needs.

[E&IT program has eight industry partners participating in advisory board activities. These eight industries and other partners participate in providing job shadowing opportunities, mock interview sessions, sponsor events, provide scholarships, and are a source of expert adjunct instructors.]

Goal 3: Upgrade facilities for quality and efficiency to enhance the student experience.

Strategy 6—Upgrade facilities for quality and efficiency to enhance the student experience.

Goal 4: Enhance professional development opportunities and quality working conditions for NOC employees.

Strategy 7—Improve new employee orientation.
Strategy 8—Enhance faculty development.
Strategy 9—Enhance staff development.
Strategy 10—Utilize an employee satisfaction survey.
Strategy 11—Conduct an annual performance and salary review.

Goal 5: Diversify and increase revenue streams.

Strategy 12—Diversify revenue internally and externally.

[E&IT program has the capability now to provide post-graduate training. This means providing training facilities and opportunities for refresher classes for operators and technicians in industry. Industries would reimburse the college for the training facilities and expertise. Additionally, the program has received donations from industry partners for projects and sponsorship of events.]

Strategy 13—Increase grant activities.

[E&IT program has been connected to multiple grants and will continue to look for grant opportunities that fit its mission and strategy.]

3.7.5 Process (Internal/External Review):
Previous Reviews and Actions from those reviews:

Analysis and Assessment (including quantitative and qualitative measures) noting key findings from internal or external reviews and including developments since the last review:

The division is currently in the process of refining the program assessment and collection of course assessment data. The previous collection of data on student performance on key outcomes was analyzed to identify gaps/overlaps in curriculum.

Work is ongoing with an advisory board to add and modify classes as needed to meet industry needs. This year a technical math course was added that would better prepare the students for the problem-solving approaches they would need in their science courses. The advisory board approved this proposal and the degree sheet was modified accordingly. Other course and content reviews are upcoming.

A. Centrality of the Program to the Institution's Mission:

This program provides the access, foundation, and opportunities for students to pursue a career in technology fields.

B. Vitality of the Program:

B.1.Program Objectives and Goals:

- Demonstrate an understanding of core refining and chemical processing principles.
- Demonstrate an understanding of what it means to operate a unit.
- Recognize and identify safety and environmental issues and constraints in operating a unit.
- Apply troubleshooting techniques to process equipment or systems.

B.2 Quality Indicators (including Higher Learning Commission issues):

- A grade of "C" or better is required in all core Process Technology courses
- A grade of "C" or better is required on all pre-requisites to the core courses.

B.3. Minimum Productivity Indicators:

Time Frame (e.g.: 5 year span)	Head Count	Graduates
2007-2008	94	29
2008-2009	88	16
2009-2010	107	20
2010-2011	107	25
2011-2012	120	24

B.4. Other Quantitative Measures:

a. Number of courses taught exclusively for the major program for each of the last five years and the size of classes:

List or attach list of courses

Courses taught on Northern Oklahoma College campuses:
PTEC 1113 – Intro to PTEC – 10 sections, 145 total enrolled=average size 14.5
PTEC 1313 – Safety – 10 sections, 146 total enrolled=average size 14.6
PTEC 2024 – Instrumentation – 6 sections, 112 total enrolled=average size 18.6
PTEC 2014 – Equipment – 5 sections, 120 total enrolled=average size 24
PTEC 2124 – Systems – 5 sections, 85 total enrolled=average size 17
PTEC 2243 – Quality -5 sections, 83 total enrolled=average size 16.6
PTEC 1124 – Troubleshooting – 5 sections, 79 total enrolled=average size 5.8
PTEC 2214 – Operations – 5 sections, 69 total enrolled=average size 13.8

PRDV 2321-002 – Professional Development – 7 sections, 90 total enrolled=average size 1.8

In addition to the preceding list of courses offered on the Northern campuses, the following courses were credited through Prior Learning Experience at OG&E as part of partnership. Average class size does not apply; however, the total number of students credited with each of the following courses through this partnership and/or through cooperative degrees with career technology centers over the five-year period is listed:

ET 1103 - Fundamentals of Electricity/Electronics - 52
ET 1253 – DC Electronics/Metrology - 14
ET 1263 – AC Electronics/Photonics - 14
ET 1363 – Electronic Devices/Standards - 7
ET 1373 – Digital Sys/Microcontrollers - 7
ET 2044 – Industrial Instrumentation - 8
ET 2113 – Intro. To PLC's and Troubleshooting - 11
ET 2253 - Hydraulics and Pneumatics - 11

b. Student credit hours by level generated in all major courses that make up the degree program for five years:

PTEC 1113 – Intro to PTEC – 145 enrollment X 3 credit hours=435
PTEC 1313 – Safety – 146 X 3=438
PTEC 2024 – Instrumentation – 112 X 4=448
PTEC 2014 – Equipment – 120 X 4=480
PTEC 2124 – Systems – 85 X 4=340
PTEC 2243 – Quality – 83 X 3=249
PTEC 1124 – Troubleshooting - 79 X 4=316
PTEC 2214 – Operations – 69 X 4=276

PRDV 2321—Professional Development – 90 X 1 credit hour=90

c. Direct instructional costs for the program for the review period:

Dedicated program director, teaching 9 credit hours per semester=$310,400
Overload/adjunct rate for instruction of 7 sections of 3-credit hour courses-$21,000
Overload/adjunct rate for instruction of 25 sections of 4-credit hour courses-$100,000

Total Instructional Cost: $431,400

d. The number of credits and credit hours generated in the program that support the general education component and other major programs including certificates:

N/A

e. A roster of faculty members, faculty credentials and faculty credential institution(s). Also include the number of full time equivalent faculty in the specialized courses within the curriculum:

Faculty	Credential	Institution that granted degree
Full-time Faculty:		
Sarah Olson	Industry experience & Master of Education	Colorado State University
Adjunct Faculty:		
Michael Stewart (Intro & Systems)	Industry experience & Associate degree	Northern Oklahoma College
Julie Allen (Troubleshooting)	Industry experience & Associate degree	Northern Oklahoma College
Stan Long (Safety)	Industry experience & coursework in Computer Science at OSU Tech	
Brent Loney (Operations)	Industry experience & Bachelor's degree	Northwestern Oklahoma State
Geoff Pettit (Instrumentation)	Industry experience & industrial electronic repair certificate	Louisiana Technical College
Rhea Jones (Quality)	Industry experience & Bachelor's degree	Southwestern Oklahoma State
Mike Angle (Equipment)	Industry experience	

f. If available, information about employment or advanced studies of graduates of the program over the past five years:

This program leads to employment. The current director has been in this position since Fall 2010. From spring 2009, as reported to her through employer and alumni surveys as well as direct contacts, the following number of graduates have been employed in applicable technical fields: 29. Two were pursuing a BS degree as of last contact.

g. If available, information about the success of students from this program who have transferred to another institution:

Not available.

B.5. Duplication and Demand:

In cases where program titles imply duplication, programs should be carefully compared to determine the extent of the duplication and the extent to which that duplication is unnecessary. An assessment of the demand for a program takes into account the aspirations and expectations of students, faculty, administration, and the various publics served by the program. Demand reflects the desire of people for what the program has to offer and the needs of individuals and society to be served by the program.

B.5. Duplication and Demand Issues:

Address Duplication:

Only two other process technology programs exist in the state (NEO and TCC). These are located in the east portion of the state. The program provides graduates to north and western Oklahoma and southern Kansas locations primarily.

Address Demand:

Instrumentation degrees are provided by six other colleges in the state, but these are all an hour or more radius away. Instrumentation job opportunities are extensive in this area as this is a high demand vocation and a relatively low number of graduates are available.

B.5.a. Detail demand from students, taking into account the profiles of applicants, enrollment, completion data, and occupational data:

Students typically complete the program in 2-3 years (this number varies depending on the number of credit hours taken per semester and math skills at degree entry).

B.5.b. Detail demand for students produced by the program, taking into account employer demands, demands for skills of graduates, and job placement data:

Industry has contacted the program concerning over 28 operator positions and 5 instrument technician positions this past year and requesting that past and upcoming graduates apply.

In this past year (summer 2012-summer 2013), the following employers have contacted the program for positions:
Phillips 66 Refining (4+ operators, 1+ instrumentation tech), Phillips 66 Pipeline (1 instrument tech), Air Products (6 operators), TKI (2 instrumentation tech), Seimans (1 operator), Sunflower Electric Power (7 operators), Koch Industries (6 operators), Tryhydro (1 operator or instrument tech), SemGroup (3 operators).

B.5.c. Detail demand for services or intellectual property of the program, including demands in the form of grants, contracts, or consulting:

N/A

B.5.d. Detail indirect demands in the form of faculty and student contributions to the cultural life and well-being of the community:

Higher paying jobs enable graduates to better address needs of their families and contribute to the economic growth of their communities.

B.5.e. The process of program review should address meeting demands for the program through alternative forms of delivery. Detail how the program has met these demands:

The program is hands-on and currently is not provided through remote ITV or web-based instruction. Required courses including science and math courses are offered in the evening to address students who work full time.

B.6. Effective Use of Resources:

Resources include financial support, (state funds, grants and contracts, private funds, student financial aid); library collections; facilities including laboratory and computer equipment; support services, appropriate use of technology in the instructional design and delivery processes, and the human resources of faculty and staff.

The program has hosted activities and participated in an NSF grant for troubleshooting curriculum and encouraging students through nation-wide competitions among other PTEC programs. In addition, an Oklahoma Works grant also is available to support projects to enhance and expand lab equipment and computer facilities and their applications in our classes.

Donations from industry include sponsorship for events (competitions, etc.) as well as equipment for student use.

A new computer lab was completed this semester with 12 computer stations which include dual monitors and dual mouse capabilities to utilize simulation software that includes 3D "outdoor" industrial equipment layouts as well as typical process control screens that would be seen in a control room. Dual smart boards (and projectors) will allow the instructor to demonstrate manipulation of the simulation and monitoring, troubleshooting, and what if scenarios. These stations are used in Operations and Troubleshooting classes.

Full size refining equipment and instrumentation, as well as smaller pilot plant scale units are located in the PTEC building and on the adjacent equipment pad. Not all of the available equipment is integrated into the curriculum at present.

Adjunct faculty with extensive direct experience and knowledge of their respective topics teach the core program courses.

Industry partners provide adjunct instructors, job shadowing opportunities, representatives for mock interviews, and advisory board members.

*Low Producing Program Reviews follow a different format and template.

Institutional Program Recommendations: (describe detailed recommendations for the program as a result of this thorough review and how these recommendations will be implemented, as well as the timeline for key elements)

Recommendations	Implementation Plan	Target Date
• **Review content with advisory boards and against national association recommendations to verify core outcomes are consistent with needs**	1. Review content internally for gaps/overlaps 2. Compare content with NAPTA recommendations 3. Share content and internal findings with advisory board	• Internal review by October 2013 • Begin Advisory Board content review of Instrumentation degree emphasis – June 2013 • Begin advisory board content review of PTEC

	4. Implement recommendations from advisory board discussions	operations degree emphasis - October 2013 • Compile recommendations and present implementation plan for program - January 2014
• **Continue to expand industry participation in degree program and its activities**	1. Coordinate with school and industry for spring career fair 2. Schedule semester teleconfereneces in addition to current email discussion panels for advisory board members 3. Provide a "newsletter" on the website outlining updates on the program and upcoming activities	• Career Fair in March 2014 • Hold teleconferences in Fall 2013 and Spring 2014 • Begin online newsletter September of 2013 and update quarterly or monthly
• **Incorporate lab equipment and instrumentation into multiple core courses**	1. Contract instrumentation expert to categorize, organize, and create lesson plans incorporating the pilot plant skids and instrumentation 2. Contract welder/pipefitter to set up a single train of equipment for use in Safety, Equipment, Instrumentation & Operations classes	• Identify experts – July 2013 • Begin instrumentation plan – August 2013 • Begin equipment train layout – September 2013 • Partial completion of train and instrumentation – January 2013 • Initial use of elements in classes – January 2013 • Completion of skids and train – August 2014