OFFICE OF THE VICE PRESIDENT OF INSTRUCTION
CURRICULUM AND GENERAL EDUCATION COMMITTEE

Memorandum

TO: Curriculum and General Education Committee
K. Bandy, M. Mayfield, T. Mendoza, J. Rangel-Escobedo, C. Duron, D. Garza, T. Payne, B. Devine, A. Bledsoe, D. Rodenhauser, K. Webster, J. Lopez, S. Eveland, ASO Representative, and PTK Representative

FROM: Dr. Vicki Jacobi, Senate Co-Chairperson
Greg Bormann, V.P. of Instruction, Co-Chairperson

DATE: August 21, 2025

SUBJECT: Next Meeting's Agenda

The next meeting of the **Curriculum and General Education Committee** will be held on **Thursday, August 21st from 1:10 p.m. to 3:00 p.m. in the Cougar Room**

AGENDA

I. CALL TO ORDER

II. PUBLIC COMMENTARY

III. APPROVAL OF MINUTES: From May 15, 2025, Curriculum & General Education meeting (p. 4)

IV. UPDATE: All that we accomplished last academic year (p. 8)

V. TRAINING

a. Changes in Title 5 language
   i. 1.55001 (b), (c), 55002, 55001.5 (b), 55100, 54221
   ii. Ed code 66275.5
   iii. Cal-GETC Standards 1.3
   iv. COR template form from Chancellor's Office
b. Changes to the Course Outline of Record
   i. New memo form (p. 9)
   ii. Timeline for submissions (p. 12)

VI. NEW BUSINESS

A. Allied Health/Applied Tech Division – New Program (p. 13)
   a. Environmental Health and Safety Degree
      i. Pending Regional Consortium approval

B. Learning Support Division (p. 34)
   a. Person-Centered Planning – Certificate of Completion (noncredit)
   b. Independent Facilitator – Certificate of Completion (noncredit)

VII. CONSENT – Items listed under the CONSENT ITEMS are considered routine and are acted on by the Committee in one motion. There is no discussion of these items before the Committee vote unless a member of the Committee, staff, or public requests specific items be discussed and/or removed from the Consent Agenda. Any person can pull items from the consent agenda and move to new business, to be discussed and voted on individually. Items typically on consent are course outline of record under five-year review, renewal of distance learning modality or inactivation of course (removal from Chancellor Office Inventory of Courses).

A. Allied Health/Applied Tech Division – Course Revisions

a. ENER 1503 Environmental Awareness & Regulatory Compliance (p. 42)
b. ENER 1510 Introduction to Energy (p. 48)
c. ENER 1025 Oil and Gas Laws and Regulations (p. 52)
d. ENER 1515 Fundamentals of Instrumentation for Energy Industries (p. 55)
e. ENER 1520 Introduction to Petroleum Technology (p. 60)
f. ENER 1530 Electricity and Basic Electronics (p. 65)
g. ENER 1540 Fundamentals of Programmable Logic Controllers (p. 73)
h. ENER 1610 Mechanical Systems (p. 81)

B. DL Approvals – General (documentation to be provided separately, pending approval)

a. ECEF 1561 Literature and Storytelling in the Early Childhood Environment
b. ECEF 1583 Using Infant Cues
c. ECEF 1584 Field Experience: Infant and Toddler Care and Education
d. ECEF 1611 Introduction to Children with Special Needs Birth to Age Eight
e. ECEF 1612 Curriculum and Intervention for Children with Special Needs
f. ECEF 1621 Administration I: Planning and Administering an Early Care and Education Program
g. ECEF 1653 Discipline Techniques for Preschool Children
h. ECEF 2021 Introduction to the Primary Grade Classroom
i. ECEF 2041 Administration II: Personnel and Leadership in Early Care and Education Programs
j. ECEF 2051 Adult Supervision: Mentoring in a Collaborative Learning Setting
k. ENER 1503 Environmental Awareness & Regulatory Compliance (p. 92)
l. ENER 1510 Introduction to Energy (p. 97)

VIII. DISCUSSION ITEMS

A. List of OER courses (p. 102)
B. CCN AB 1111 (p. 105)
  a. Phase II A Fall 2026: ARTH 1510, 1520, ECON 2110, 2210, ENGL 1650, 1600—Due October 2025
  b. Phase II B Fall 2027: ASTR 1511, MATH 2100, 2120, COMM 1530, PSYC 2003, BIOL 1500, BIOL 1510, SOC 1510
  c. Waiting for Chemistry, Anatomy, and Physiology
  d. Phase III Fall 2027
C. AB 928 deadlines
D. AB 1705 impact of Calculus I (MATH 2100)
E. Standardized Attendance Accounting
F. Course Dog status
G. Program sheets-Program Mapper Program
H. Credit for Prior Learning procedures
I. AI in Canvas
J. Non-credit certificates
K. Environmental Justice Green Leaf
L. ACCJC Standards
M. Competency Based Education
N. Charter Update (p. 106)

a. Equity Compliance
b. Add Co-Chair of distance learning education committee to membership

O. Division update
a. Courses with 5-year updates (p. 110)

IX. NEXT MEETING: TBD September 2025 from 1:10-2:30pm in the Cougar Room

X. PROGRAM STATUS: See the table below

Program	Tech Review Approved	C & GE Approved	Board Approved	Status
Psychology ADT	March 14, 2024	March 22, 2024	June 12, 2024	Being Revised
***Political Science ADT**	March 14, 2024	March 22, 2024	June 12, 2024	Approved
Mathematics 2.0 ADT	March 10, 2025	March 22, 2025	May 14, 2025	Under Review

*** New Program**

X. ADJOURNMENT

OFFICE OF THE VICE PRESIDENT OF INSTRUCTION
CURRICULUM AND GENERAL EDUCATION COMMITTEE

Memorandum

Present: K. Bandy, M. Mayfield, C. Duron, D. Garza, B. Devine, A. Bledsoe, M. Oja, J. Lopez, G. Bormann, J. Norris, V. Jacobi, S. Eveland
C. Duron represented J. Rangel-Escobedo
M. Oja represented T. Mendoza

Absent: J. Rangel-Escobedo, T. Mendoza

DATE: May 15, 2025

MINUTES

I. CALL TO ORDER
The committee was called to order at 1:10pm.

II. PUBLIC COMMENTARY
No public commentary.

III. APPROVAL OF MINUTES: From May 2, 2025 Curriculum & General Education meeting
No changes and accepted as approved.

IV. NEW BUSINESS

A. Certificate of Achievement - California General Education Transfer Curriculum (Cal-GETC)

Program Learning Outcomes bullet #3 was removed on pages 8 and 13. On a motion by K. Bandy, seconded by M. Mayfield, and unanimously approved by all, the program was approved.

V. CONSENT - Items listed under the CONSENT ITEMS are considered routine and are acted on by the Committee in one motion. There is no discussion of these items before the Committee vote unless a member of the Committee, staff, or public requests specific items be discussed and/or removed from the Consent Agenda. Any person can pull items from the consent agenda and move to new business, to be discussed and voted on individually. Items typically on consent are course outline of record under five-year review, renewal of distance learning modality or inactivation of course (removal from Chancellor Office Inventory of Courses).

Several consent items were pulled by V. Jacobi due to them not having SLO's approved or DL approvals. The following consent items were approved on a motion by A. Bledsoe, seconded by K. Bandy and unanimously approved by all.

A. 1-16, 23
B. 2-16
C. 2-3, 13-30

The remainder of the consent items were pulled and tabled.

A. Allied Health/Applied Tech Division – Course Revisions

1. CTRP 1010 Machine Shorthand Theory and Lab
2. CTRP 1131 60 WPM Machine Shorthand Speed Building Literary and Jury Charge
3. CTRP 1132 100 WPM Machine Shorthand Speed Building Literary and Jury Charge
4. CTRP 1133 140 WPM Machine Shorthand Speed Building Literary and Jury Charge
5. CTRP 1134 180 WPM Machine Shorthand Speed Building Literary and Jury Charge
6. CTRP 1141 60 WPM Machine Shorthand Speed Building 2-Voice
7. CTRP 1152 120 WPM Machine Shorthand Speed Building Literary and Jury Charge
8. CTRP 1153 160 WPM Machine Shorthand Speed Building Literary and Jury Charge
9. CTRP 1154 200 WPM Machine Shorthand Speed Building Literary and Jury Charge
10. CTRP 1161 80 WPM Machine Shorthand Speed Building 2-Voice
11. CTRP 1162 120 WPM Machine Shorthand Speed Building 2-Voice
12. CTRP 1163 160 WPM Machine Shorthand Speed Building 4-Voice
13. CTRP 1164 200 WPM Machine Shorthand Speed Building 4-Voice
14. CTRP 1260 Machine Shorthand Speed Building Dictation/Transcription
15. ~~ENER 1503 Environmental Awareness & Regulatory Compliance~~
16. ~~ENER 1510 Introduction to Energy~~
17. ~~ENER 1025 Oil and Gas Laws and Regulations~~
18. ~~ENER 1515 Fundamentals of Instrumentation for Energy Industries~~
19. ~~ENER 1520 Introduction to Petroleum Technology~~
20. ~~ENER 1530 Electricity and Basic Electronics~~
21. ~~ENER 1540 Fundamentals of Programmable Logic Controllers~~
22. ~~ENER 1610 Mechanical Systems~~
23. UDGE 3005 Research Methodology

B. Social Sciences Division – Course Revisions

1. ~~ADMJ 2134 Correctional Interviewing and Counseling~~
2. ECEF 1561 Literature and Storytelling in the Early Childhood Environment
3. ECEF 1581 Introduction to Infant Development – Infant, Family, and Society
4. ECEF 1582 Infant Massage
5. ECEF 1583 Using Infant Cues
6. ECEF 1584 Field Experience: Infant and Toddler Care and Education
7. ECEF 1611 Introduction to Children with Special Needs Birth to Age Eight
8. ECEF 1612 Curriculum and Intervention for Children with Special Needs
9. ECEF 1621 Administration I: Planning and Administering an Early Care and Education Program
10. ECEF 1653 Discipline Techniques for Preschool Children
11. ECEF 2021 Introduction to the Primary Grade Classroom
12. ECEF 2041 Administration II: Personnel and Leadership in Early Care and Education Programs
13. ECEF 2051 Adult Supervision: Mentoring in a Collaborative Learning Setting
14. HIST 2000 Critical Thinking and the Historian's Craft
15. HIST 2231 History of the United States to 1877 (CCN)
16. HIST 2232 History of the United States Since 1877 (CCN)

C. DL Approvals – General (documentation to be provided separately, pending approval)

1. ~~ECEF 1561 Literature and Storytelling in the Early Childhood Environment~~

2. ECEF 1581 Introduction to Infant Development – Infant, Family, and Society
3. ECEF 1582 Infant Massage
4. ~~ECEF 1583 Using Infant Cues~~
5. ~~ECEF 1584 Field Experience: Infant and Toddler Care and Education~~
6. ~~ECEF 1611 Introduction to Children with Special Needs Birth to Age Eight~~
7. ~~ECEF 1612 Curriculum and Intervention for Children with Special Needs~~
8. ~~ECEF 1621 Administration I: Planning and Administering an Early Care and Education Program~~
9. ~~ECEF 1653 Discipline Techniques for Preschool Children~~
10. ~~ECEF 2021 Introduction to the Primary Grade Classroom~~
11. ~~ECEF 2041 Administration II: Personnel and Leadership in Early Care and Education Programs~~
12. ~~ECEF 2051 Adult Supervision: Mentoring in a Collaborative Learning Setting~~
13. HIST 2000 Critical Thinking and the Historian's Craft
14. HIST 2231 History of the United States to 1877 (CCN)
15. HIST 2232 History of the United States Since 1877 (CCN)
16. CTRP 1131 60 WPM Machine Shorthand Speed Building Literary and Jury Charge
17. CTRP 1132 100 WPM Machine Shorthand Speed Building Literary and Jury Charge
18. CTRP 1133 140 WPM Machine Shorthand Speed Building Literary and Jury Charge
19. CTRP 1134 180 WPM Machine Shorthand Speed Building Literary and Jury Charge
20. CTRP 1141 60 WPM Machine Shorthand Speed Building 2-Voice
21. CTRP 1152 120 WPM Machine Shorthand Speed Building Literary and Jury Charge
22. CTRP 1153 160 WPM Machine Shorthand Speed Building Literary and Jury Charge
23. CTRP 1154 200 WPM Machine Shorthand Speed Building Literary and Jury Charge
24. CTRP 1161 80 WPM Machine Shorthand Speed Building 2-Voice
25. CTRP 1162 120 WPM Machine Shorthand Speed Building 2-Voice
26. CTRP 1163 160 WPM Machine Shorthand Speed Building 4-Voice
27. CTRP 1164 200 WPM Machine Shorthand Speed Building 4-Voice
28. CTRP 1260 Machine Shorthand Speed Building Dictation/Transcription
29. ~~ENER 1503 Environmental Awareness & Regulatory Compliance~~
30. ~~ENER 1510 Introduction to Energy~~

Consent items with strikethroughs have been pulled and tabled.

VI. DISCUSSION ITEMS

A. New Advisory Language
This item was also discussed previously in Tech Review and moved to curriculum for an update and further discussion. There is a need for general language on courses with ENGL 1000 and READ 1005 as a prerequisite. Something similar to "Basic English, Math, Reading, and Writing is strongly recommended." This suggested language will go through the next Curriculum and General Education Meeting.

B. Work Experience ENER 1513
V. Jacobi provided the background of work experience and changes from the Chancellor's Office regarding hours and updated. She also went through a potential process stating that internships from the Foundation should go the work experience.

C. Political Science POSC to POLS

It was determined that there is a need to change the dept name from POSC to POLS in order to match the CCN changes. A memo from the Social Sciences department was requested for these changes.

D. 5-year review list
The 5-year review list was re-shared to the committee members.

E. Curriculum Tracking System Update
Taft College is in pursuit of an eLumen (Coursedog) contract for curriculum management. M. Oja expressed concern that the software will potentially be bought without faculty input. G. Bormann stated that there will be training for faculty, and that faculty will minimally interact with the software.

F. Curriculum Related Comments
V. Jacobi sent current CCN templates to division chairs and urged them to submit them to C & GE in September or October.

K. Bandy advocated the need for a subcommittee for curriculum development and marketing. The Academic Senate will take up the subcommittee creation.

Discussion was made about the submission of a Geology and Physics ADT. M. Mayfield stated that it is "in the pipeline."

VII. NEXT MEETING: TBD August 2025 from 1:10-2:30pm in the Cougar Room

VIII. PROGRAM STATUS: See the table below

Program	Tech Review Approved	C & GE Approved	Board Approved	Status
Psychology ADT	March 14, 2024	March 22, 2024	June 12, 2024	Under Review
***Political Science ADT**	March 14, 2024	March 22, 2024	June 12, 2024	Under Review
Kinesiology ADT	May 2, 2023	March 22, 2024	May 10, 2023	Approved

*** New Program**

IX. ADJOURNMENT

Academic Year 24-25	Quantity
Courses	113
Programs	10

TAFTCOLLEGE

Course Development Memo

To: Greg Bormann, Vice President of Instruction
Dr. Vicki Jacobi, Curriculum Co-Chair

From:

Division: Choose an item.

Date: Click here to enter a date.

Re:

Type of Curriculum Change:

☐ New Course*
☐ Non-substantial Course Change*
☐ Substantial Course Change*
☐ Course Inactivation

For Course Changes, why is this course being updated?

☐ For C-ID

☐ As part of the 5 year review cycle

☐ Other (please explain):_____

Courses need review for SLOs and DLE applications before coming to Tech Review. CSLO and GELO need to be included in the Course Outline of Record.

Date COR went to SLO Committee _____

Date COR went to Distance Learning Education Committee _____

All courses need to have examples of Reading, Writing, and Critical Thinking assignments whether in class or outside of class.

For New Courses, please enter a justification for the request through the Course Approval Application:

Course Approval Application attached? Yes ( ) No ( )

Programs Affected/Stand Alone:

Please list all degrees and certificates affected. The division will need to submit the degrees where the CORs is part of the degree.

Click here to enter text.

*SLOs are required

☐ **Addition to Taft College General Education:**

☐ Natural Science ☐ Social & Behavioral Science ☐ English Composition

☐ Arts &Humanities ☐ Communication & Analytical Thinking

☐ Ethnic Studies ☐ Lifelong Learning

☐ Mathematical Concepts & Quantitative Reasoning ☐ American History & Ideals

Justification for Addition to Taft College General Education:

Please list the General Education SLOs this course meets:

Click here to enter text.

*SLOs are required

Course Approval Process Recommendations

Check all that apply:

_____ Baccalaureate credit yes ( ) no ( )
Is it part of a transfer major preparation? yes ( ) no ( )
If yes, then which degree and at what institution? List at least two.

1._____

2. _____

_____ AA/AS/ADT credit
Major: _____
Required in major? yes ( ) no ( )
Recommended in major? yes ( ) no ( )
Certificate: _____
Required in certificate? yes ( ) no ( )
Recommended for certificate? yes ( ) no ( )
_____ ADT template completed yes ( ) no ( )
_____ TC general education yes ( ) no ( )

Area: _____

_____ Cal-GETC
Area: _____

_____ Submit for UC transfer

Signatures

Prepared by: _____ Date: _____

Department Chair: _____ Date: _____

Articulation Officer: _____ Date: _____

VP of Instruction: _____ Date: _____

Curriculum Co-chair: _____ Date: _____

08/07/2025 version

Curriculum Process Timeline

Course creation or revisions

1. At division level, create new courses or revise courses (at least every five years)

   Check C-ID and Common Course Numbering Templates

2. For SLO revisions be sure to check Program level SLOs and local GE pattern SLOs

   Division Chair sends to SLOAS Committee (Adam)
   Division Chair sends to Distance Learning Education Committee (Jaime)

3. Once recommended by committees, the division chair sends a memo, the new checklist, and COR for Tech Review (Jason)

   Tech Review either moves it forward to Curriculum Committee or technician sends back to chair for requested revisions. With revisions, COR can go directly to Curriculum Committee

4. Curriculum Committee makes recommendations and forwards them to Board of Trustees for approval.

5. Office of Instruction sends to Chancellor's Office for chaptering

6. Articulation Officer sends to UC only in August to request course for UC transferability

7. Send to Cal-GETC through ASSIST.org in December for a request for Cal-GETC approval (hear back in April)
8. Articulation Officer sends to C-ID for approval if it is a C-ID course.

9. New Classes go in Catalog by May 1st, can be offered following fall, unless course is going to be a part of a program. We then need to wait until the program has been approved.

   Example timeline

   Course goes to Curriculum in October, Board in November and Chancellor's Office in November. Course might take a few weeks to get chapter but if UC eligible, it will not be sent to UC system until August of the following year.

   Course goes to Curriculum in February, Board in March and Chancellor's Office in April. Chaptered by Chancellor's Office in May, submitted to UC system in August.

   Courses can be added to the catalog in November and May. Programs only May.

TAFTCOLLEGE

NARRATIVE for Environmental Health and Safety Associate in Science (A.S,) Degree

Item 1. Program Goals and Objectives

Program Goals:

1. Ensure students complete appropriate curricula and required hours of instruction to work in the field of environmental health and safety.
2. Improve the communities through compliance with environmental and safety laws.
3. Prepare students with entry level skills for this growing profession.
4. Support industry needs of a high-quality environmental health and safety program that includes knowledge of various compliance laws.

Program Objectives:

1. Be able to perform entry level functions as an environmental health and safety professional.
2. Exhibit foundation skills and knowledge necessary for technicians (Air Permitting and Enforcement Aide, Compliance Investigator Aide, Environmental Compliance Inspector Aide, Environmental Protection Specialist, Environmental Quality Analyst Aide, Toxics Program Technician, Waste Management Specialist Aide).

Program Learning Outcomes:

1. Use critical thinking and analysis to solve problems in the environmental health and safety field, including issues involving various aspects of Environmental law (State and Federal) and Endangered species.
2. Demonstrate technical competencies and safe practices through applying course knowledge and skills in fire prevention, regulatory compliance and the endangered species act.
3. Apply ethical and professional practices in various settings including a social responsibility to protect people and the environment for future generations.

Item 2. Catalog Description

The Associate in Science in Environmental Health and Safety is geared towards providing training and education in various aspects within environmental health and safety for companies and agencies in both the public and private sector. This degree is ideal for those wishing to learn more about California Occupational Safety and Health (Cal OSHA) policies, expectations, and requirements. The program also provides courses in environmental law, natural science, and endangered species. The program is ideal for environmental health and safety officers at governmental agencies, places of business and industry, safety trainers, ~~and teachers~~, environmental specialists, inspectors, operations managers and supervisors, and field staff. Students earn an associate in science degree in Environmental Health and Safety upon the successful completion of program requirements.

TAFTCOLLEGE

Item 3. Program Requirements

ASSOCIATE IN SCIENCE DEGREE – Environmental Health and Safety

Requirements	Dept. Name/#	Name	Units	Local	Sequence
Required Core (24 units)	ENER 1503	Environmental Awareness and Regulatory Compliance	3		Yr. 1, Spring
	OSH 1500	Occupational Safety and Health Compliance	3		Yr. 1, Fall
	OSH 1532	Industrial Hygiene	3		Yr. 1, Fall
	~~OSH 2900~~	~~OSH Capstone~~			Yr. 2, Spring
	EHS 1560	Fire Prevention	3		Yr. 2, Spring
	EHS 1550	Endangered Species	3		Yr. 1, Spring
	BIOL 1500	Fundamentals of Bio	3		Yr. 2, Fall
	BIOL 1513	Into Environmental	4		Yr.1, Summer Yr. 2, Fall
Elective courses	ENER 1510	Intro to Energy	3		Yr. 2, Fall

Required Major Total	22	~~24~~ units
Completion of local pattern	27	~~37-39~~ units
Transferable electives	11	
TOTAL UNITS		60 units

Proposed sequence of courses:

Proposed Sequence:
Year 1, Fall = 15 units
Year 1, Spring = 13-15 units
Year 1, Summer = 3 units
Year 2, Fall = 15 units
Year 2, Spring = 16 units
TOTAL UNITS: 60 units

Item 4. Master Planning

Taft College has had a long-standing relationship with the oil and gas industry and concern for environmental compliance within these industries. The new degree allows for greater employability, expanding the types of employers who hire environmental specialists. With the new degree, students will be able to secure employment directly upon completion of the degree and still be able to transfer to a bachelor's degree program.

Item 5. Enrollment and Completer Projections

1. The number of sections of core courses to be offered annually = 8
2. The headcount student annual enrollment = 30
3. The number of estimated program completers per year at the end of the first year of program operation = 15
4. The number of estimated program completers per year at the end of the third year of program operation = 30

Item 6. Place of Program in Curriculum/Similar Programs

This program is intended to replace Taft College's Occupational Safety and Health degree.

Item 7. Similar Programs at Other Colleges in Service Area

There are no similar programs at the other colleges within our service area.

Item 8. Labor Market Information & Analysis (CTE only)

Item 9. Employer Survey (CTE only)

A specific survey was not conducted, however, based on the analysis of the information provided under the Labor Market, there is a need for this profession. Employment outlook is favorable as it is expected to grow faster than average. According to O*NET Online, environmental compliance inspectors have an expected 10% growth trend. For Occupational Health and Safety Specialist the outlook is bright. Updated 2025.

Item 10. Explanation of Employer Relationship (CTE only)

The Taft College Environmental Health and Safety professors work closely with firms and agencies working in the field to provide support to the students, the college, and the industry. The college will work with industry firms and professionals to ensure ~~that~~ the courses and activities are aligned with industry standards. Taft College has been developing relationships with industry partners.

Item 11. List of Advisory Committee members (CTE only)

Terry Davis	**Consultant**	
Chad Sicari	**Community Representative**	
Devin Daughty	**Dean**	Instruction and CTE Taft College
Darcy Bogle	**Faculty**	Professor/Counselor-Taft College
Kristi Richards	**Faculty**	CTE Counselor -Taft College
Vicki Jacobi	**Faculty**	Counselor/Articulation
Kanoe Bandy	**Faculty**	Division Chair Taft College
Leslie Minor	**Vice President Instruction**	Taft College
Daniel Kerr	**Community Representative**	
Bryan Payne	**Community Representative**	

Item 12. Recommendation of Advisory Committee (CTE only)

An Advisory Committee was created in the spring of 2022. In the September 2023 meeting, members agreed that the name change more accurately describes the program for potential students and employees. The College will investigate whether there are the resources to expand the program with Certificate of Achievement with specialization in the field.

MEMO

To:	Greg Bormann, Vice President of Instruction Vicki Jacobi, Curriculum Co-Chair
From:	Kanoe Bandy
Division:	Applied Technologies
Date:	6/23/2025
Re:	Environment Health and Safety Associate in Science (A.S.) Degree

Program Title: ___Associate of Science in Environmental Health and Safety_____

Type of Curriculum Change:

☒ New Program ☐ Substantial Program Change* ☐ Nonsubstantial Program Change*

**For Program inactivations, please follow Administrative Procedure 4021*

I have reviewed the Program Review prior to updating this program:

☐ Yes ☐ No

Justification for Request:
Please enter a brief description of the background and rationale for the new program or for the changes if amending an existing program.

The Allied Health and Applied Tech department is interested in providing a more accessible program to our Energy and Occupational Health and Safety students. This program is designed for our students to be successful within the environmental safety field as professionals. This will be a completely online program and if successful, will replace the Energy Tech program.

Program Learning SLO's:

*Program SLOs are required

- Students will be able to use critical thinking and analysis to solve problems in the environmental health and safety field, including issues involving various aspects of Environmental law (State and Federal) and Endangered species. (K- Knowledge)
- Students will be able to demonstrate technical competencies and safe practices through applied tasks including scenarios where students are asked to apply course knowledge and develop compliance paths for Environmental Health and Safety projects. (S- Skills)
- Students will be able to apply and reflect on their ethics and professional practices in various settings including a social responsibility to protect people and the environment for future generations. (A-Affective)

*Program SLOs are required

The new Curriculum Inventory System, launched in September 2012, has added new requirements to program proposals. Please fill out this form and include it with your degree or certificate submission.

Program Title: Environmental Health and Safety Associate in Science

Program TOP Code: 0956-70 Industrial and Occupational Safety and Health
The TOP code is assigned according to the content and outcomes of the program, and must conform closely to the TOP code given to similar programs in other colleges around the state. The TOP code reflects the main discipline or subject matter, thus the program TOP code will reflect the majority of required degree courses.

Annual Completers: 15 1st year, 30 per year after the 3 year
Number of students estimated to receive the degree or certificate each year after the program is fully established.

Program Goal: CTE
Degree and Certificate programs may have the following specified program goals: Career Technical Education (CTE), Transfer, CTE & Transfer, and Other- Designed to meet community needs.

Net Annual Labor Demand (CTE only): 200
For CTE programs only, fill in the estimated number of annual job openings, minus the annual number of program completers of other programs within the counties in the college service areas. In most cases, this figure must cover only the counties within the college's service area but for occupations considered to have a larger regional or statewide training and recruitment area, the larger area may be used.

Faculty Workload: 1
Provide the number of full-time equivalent faculty that will be dedicated to teaching the courses in this program, in the program's first full year of operation, regardless of whether they are new or existing faculty. This estimate is not the number of FTES (full time equivalent students) expected to be generated by the program. The number must be entered as a decimal—for example, one and a quarter full-time equivalent faculty would be entered as 1.25.

New Faculty Positions: 0
Provide the number (not FTEF) of separately identified new positions, both part- and full-time. For example, if three part-time positions will be new, then enter the number 3 (three). If existing faculty are sufficient for offering the program with courses and no plans exist to hire new faculty, enter 0 (zero).

New Equipment: 0
If new equipment will be acquired for this program, estimate (in dollars) the total cost from all sources, including district and state funds.

New/Remodeled Facility: 0
If new or remodeled facilities will be acquired for this program, estimate (in dollars) the cost from all sources, including district and state funds.

Library Acquisitions: $1,000
Provide the estimated cost (in dollars) of library and learning resources materials

Program Review Date: Annual, per TC Program Review Schedule
Enter the month and year of the first scheduled review after it has been approved. For degrees/certificates with a program goal of ""Career Technical Education (CTE)" or "Career Technical Education (CTE) and Transfer," pursuant to Education code section 78016 the degree/certificate must be reviewed every two (2) years.

Gainful Employment: Yes or No
Indicate if the program meets U.S. Department of Education gainful employment criteria. Not applicable for AA-T or AS-T degrees.

Apprenticeship: Yes or No
Select "No" if the program is not an apprenticeship. Select "Yes" if the program is an apprenticeship with approval from the Division of Apprenticeship Standards.

Distance Education: 50-99%
Indicate the extent to which the courses associated with the certificate are conducted via distance education; four choices are available, 0%, 1-49%, 50-99%, or 100%

CTE Regional Consortium Approved: Yes or No Not at this time
For programs with a selected program goal of CTE or CTE and Transfer, by selecting "Yes" the college certifies that the certificate was approved by the CTE regional consortium. For a program with a selected goal that does not include CTE, this field is not required.

February 2024

Labor Market Analysis

Environmental Health and Safety

Prepared by Central Valley/Mother Lode Center of Excellence

C·O·E
CENTERS OF EXCELLENCE
Inform Connect Advance

POWERED BY
California Community Colleges

Table of Contents

If for any reason this document is not accessible or if you have specific needs for readability, please contact us and we will do our utmost to accommodate you with a modified version. To make a request, contact Juan Madrigal by email at juan@coeccc.net.

Summary

The Central Valley/Mother Lode Center of Excellence developed this report for Taft College to determine whether there is demand in the local labor market that is not being met by the supply from postsecondary programs. This report summarizes labor market demand, wages, skills, and postsecondary supply for Environmental Health and Safety:

- Environmental Science and Protection Technicians, Including Health (SOC 19-4042)
- Occupational Health and Safety Specialists (SOC 19-5011)
- Occupational Health and Safety Technicians (SOC 19-5012)

Key Findings

- **Occupational Demand —** Environmental Health and Safety occupations have a labor market demand of 201 annual job openings in the South Central Valley/Southern Mother Lode (SCV/SML) subregion. Between 2022 and 2027, *Occupational Health and Safety Specialists* are projected to have the most demand, with 97 annual job openings.

- **Wages —** The average entry-level wage for the occupations of interest is $19.20/hour, which is above the living wage in the SCV/SML subregion – $11.91/hour for a single adult.[1] Of the three occupations, *Occupational Health and Safety Specialists* earn the highest entry-level wage, $31.66/hour.

- **Employers and Job Titles —** Employers in the SCV/SML subregion include Randstad, State of California, and Clean Harbors.

- **Skills and Certifications —** The top baseline skill is management; the top specialized skill is Occupational Safety and Health Administration (OSHA); and the top software skill is Microsoft Office. The most in-demand certification is Cardiopulmonary Resuscitation (CPR).

- **Education —** A high school diploma or equivalent is typically required for *Occupational Health and Safety Technicians*. An associate degree is typically required for *Environmental Science and Protection Technicians, Including Health* and a bachelor's degree is typically required for *Occupational Health and Safety Specialists*.

- **Supply and Demand Analysis —** Based on 201 annual openings (i.e., demand) and 10 postsecondary degrees awarded (i.e., supply), an analysis of supply and demand suggests there is an undersupply of 191 workers in the SCV/SML subregion. In the CVML region, 10 awards were conferred suggesting an undersupply of 284 workers (based on 294 annual openings in the CVML region).

Recommendation

Based on a comparison of demand and supply, there is an undersupply of trained workers in the SCV/SML subregion and the CVML region. The Center of Excellence recommends that Taft College work with the regional directors, the college's advisory board, and local industry in the development of programs to address the shortage of Environmental Health and Safety workers.

[1] The term "living wage" in Center of Excellence reports is calculated by averaging the self-sufficiency wages from the Insight Center's California Family Needs Calculator for each county in the subregion: https://insightcced.org/tools-metrics/self-sufficiency-standard-tool-for-california/.

Introduction

The Central Valley/Mother Lode Center of Excellence developed this report to provide Taft College with labor market information for Environmental Health and Safety. The geographical focus for this report is the South Central Valley/Southern Mother Lode (SCV/SML) subregion, but regional demand and supply data has been included for broader applicability and use. Analysis of the program and occupational data related to Environmental Health and Safety is included in this report. The Standard Occupational Classification (SOC) System codes and occupational titles used in this report are from the Bureau of Labor Statistics and O*NET OnLine:

Environmental Science and Protection Technicians, Including Health (SOC 19-4042)

- **Job Description:** Perform laboratory and field tests to monitor the environment and investigate sources of pollution, including those that affect health, under the direction of an environmental scientist, engineer, or other specialist. May collect samples of gases, soil, water, and other materials for testing.
- **Knowledge:** Customer and Personal Service, Chemistry, English Language, Biology, Law and Government
- **Skills:** Reading Comprehension, Active Listening, Speaking, Writing, Critical Thinking

Occupational Health and Safety Specialists (SOC 19-5011)

- **Job Description:** Review, evaluate, and analyze work environments and design programs and procedures to control, eliminate, and prevent disease or injury caused by chemical, physical, and biological agents or ergonomic factors. May conduct inspections and enforce adherence to laws and regulations governing the health and safety of individuals. May be employed in the public or private sector.
- **Knowledge:** Education and Training, English Language, Chemistry, Public Safety and Security, Law and Government
- **Skills:** Speaking, Active Listening, Complex Problem Solving, Critical Thinking, Reading Comprehension

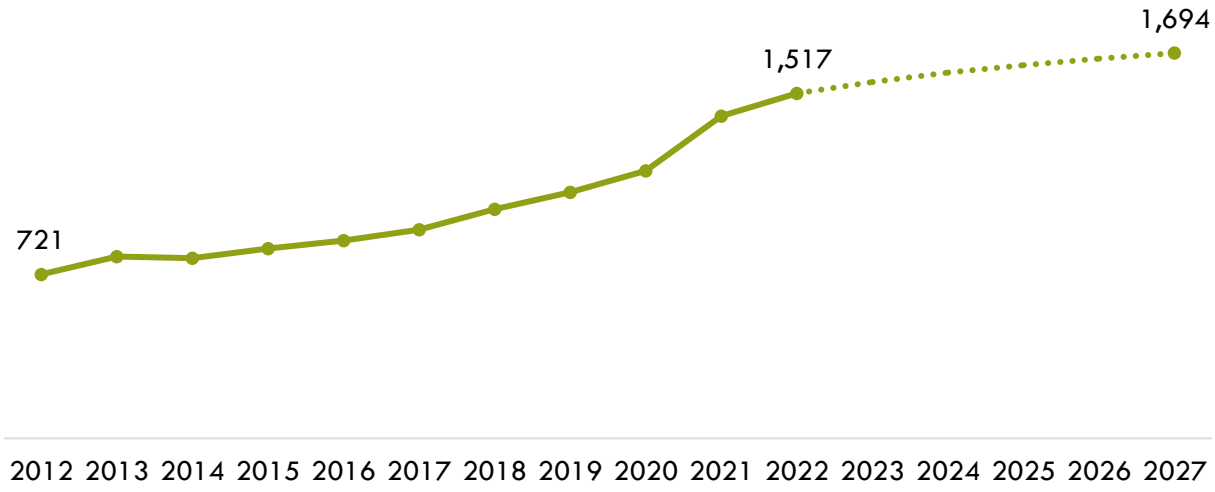
Occupational Health and Safety Technicians (SOC 19-5012)

- **Job Description:** Collect data on work environments for analysis by occupational health and safety specialists. Implement and conduct evaluation of programs designed to limit chemical, physical, biological, and ergonomic risks to workers.
- **Knowledge:** Education and Training, English Language, Customer and Personal Service, Public Safety and Security, Chemistry
- **Skills:** Active Listening, Critical Thinking, Reading Comprehension, Speaking, Writing

Employment

Exhibit 1a shows the employment trends for Environmental Health and Safety occupations in the SCV/SML subregion. Between 2022 to 2027, the number of jobs for the three occupations studied in this report is projected to increase by 177, growing by 12%.

Exhibit 1a. Historical employment and projected occupational demand for Environmental Health and Safety occupations in the SCV/SML subregion, 2012-2027



Environmental Health and Safety occupations in the SCV/SML subregion employed 1,517 workers in 2022 (Exhibit 1b). *Occupational Health and Safety Technicians* are projected to have the largest growth, 15%. There will be approximately 201 openings per year for the three occupations studied in this report.

Exhibit 1b. Current employment and projected occupational demand for Environmental Health and Safety occupations in the SCV/SML subregion, 2022-2027

Occupation	2022 Jobs	2027 Jobs	5-Year Change	5-Year % Change	Annual Openings
Environmental Science and Protection Technicians, Including Health	588	635	47	8%	71
Occupational Health and Safety Specialists	701	796	95	14%	97
Occupational Health and Safety Technicians	228	263	35	15%	33
TOTAL	**1,517**	**1,694**	**177**	**12%**	**201**

Wages

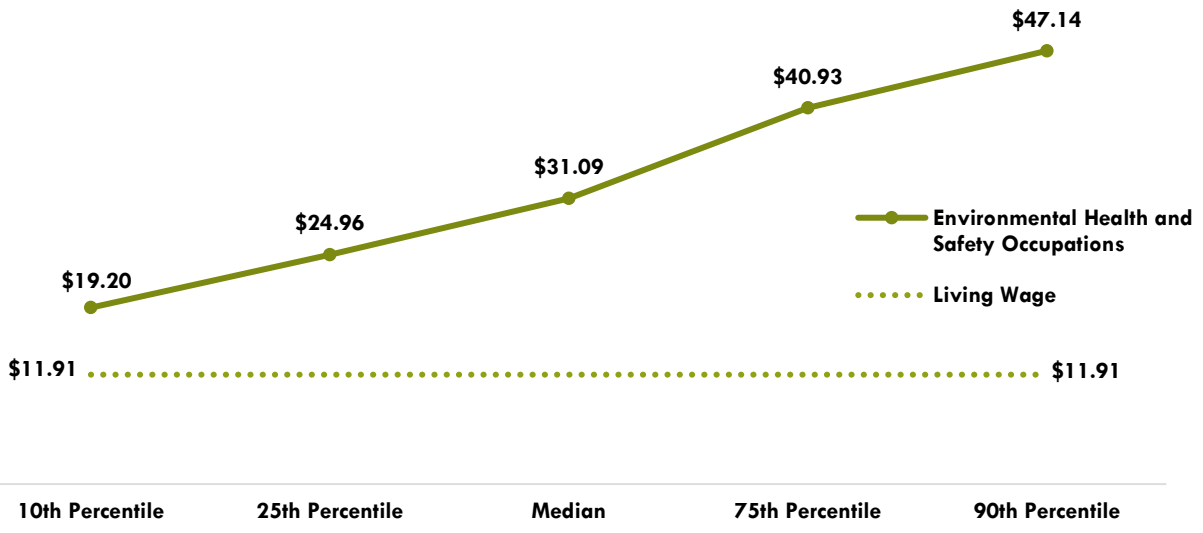
The average living wage for a single adult in the SCV/SML subregion is $11.91/hour.[2] Exhibit 2a shows the average entry-level hourly wages for the three occupations of interest. *Occupational Health and Safety Specialists* are paid the highest entry-level wage, which is $31.66/hour.[3]

Exhibit 2a. Hourly wages for Environmental Health and Safety occupations in the SCV/SML subregion

Occupation	25th Percentile Hourly Earnings	Median Hourly Earnings	75th Percentile Hourly Earnings
Environmental Science and Protection Technicians, Including Health	$22.19	$29.45	$44.03
Occupational Health and Safety Specialists	$31.66	$38.74	$48.90
Occupational Health and Safety Technicians	$21.05	$25.07	$29.86

Exhibit 2b shows the average hourly wages for the three Environmental Health and Safety occupations; all five wages are above the living wage for the SCV/SML subregion.

Exhibit 2b. Average hourly wages for Environmental Health and Safety occupations in the SCV/SML subregion



[2] The term "living wage" in Center of Excellence reports is calculated by averaging the self-sufficiency wages from the Insight Center's California Family Needs Calculator for each county in the subregion: https://insightcced.org/tools-metrics/self-sufficiency-standard-tool-for-california/.

[3] Note: 10th and 25th percentiles are considered entry-level wages while 75th and 90th are considered experienced wages, which may be obtained through long-term employment or extra training, etc.

Job Postings

There were 895 unique job postings for Environmental Health and Safety occupations in the SCV/SML subregion from January to December 2023.[4]

Top Employers

The employers with the most job postings are listed in Exhibit 3. The top employers in online job postings were Randstad, State of California, and Clean Harbors.

Exhibit 3. Top Environmental Health and Safety employers

Employer
Randstad
State of California
Clean Harbors
Montrose Environmental Group
Rosendin Electric
HPC Industrial
Dragados
California State University
United States Navy
CalPortland

Top Job Titles

Exhibit 4 shows the most common job titles in the SCV/SML subregion.

Exhibit 4. Top job titles in job postings

Occupational Title
Safety Coordinators
Safety Managers
Environmental Technicians
Safety Specialists
Health and Safety Specialists
Environmental Field Technicians
Environmental Health Specialists
Safety Technicians

[4] Other than occupational titles and job titles, the categories below can be counted one or multiple times per job posting, and across several areas in a single posting. For example, a skill can be counted in two different skill types, and an employer can indicate more than one education level.

Salaries

Exhibit 5 shows the "Market Salaries" for the three occupations of interest. These are calculated by Lightcast using a machine learning model built from millions of job postings every year. This accounts for adjustments based on location, industry, skills, experience, education, among other variables.

Exhibit 5. Market salaries in Environmental Health and Safety job postings

Market Salary	Job Postings
$30,000-$41,999	102
$42,000-$53,999	112
$54,000-$65,999	99
$66,000-$77,999	82
$78,000-$89,999	64
$90,000+	118

Education

Of the 895 unique job postings, 697 listed a preferred or minimum educational requirement for the position being filled. Among those, 33% requested a high school diploma or GED, 13% requested an associate degree, and 45% requested a bachelor's degree (Exhibit 6).

Exhibit 6. Education levels requested in Environmental Health and Safety job postings

Education Level	Job Postings	% of Job Postings
High school or GED	230	33%
Associate degree	89	13%
Bachelor's degree	316	45%
Masters or higher	62	9%

Baseline, Specialized, and Software Skills

Exhibit 7 depicts the top baseline, specialized, and software skills in job postings. The most common baseline skill is management. The most common specialized skill is Occupational Safety and Health Administration (OSHA). The most important software skill is Microsoft Office.

Exhibit 7. In-demand baseline, specialized, and software skills in Environmental Health and Safety job postings

Baseline Skills	Specialized Skills	Software Skills
Management	Occupational Safety and Health Administration (OSHA)	Microsoft Office
Communication	Auditing	Microsoft Excel
Operations	Safety Training	Microsoft PowerPoint
Investigation	Occupational Safety and Health	Microsoft Outlook
Leadership	Environment Health and Safety	Active Server Pages (ASP)

Certifications

Of the job postings listing a desired certification, 22% indicated a need for Cardiopulmonary Resuscitation (CPR) (Exhibit 8).

Exhibit 8. Top certifications in Environmental Health and Safety job postings

Certifications	% of Job Postings
Cardiopulmonary Resuscitation (CPR) Certification	22%
First Aid Certification	19%
Certified Safety Professional	19%
30-Hour OSHA General Industry Card	10%
Construction Health and Safety Technician	10%

Education, Work Experience, & Training

A high school diploma or equivalent is typically required for *Occupational Health and Safety Technicians*. An associate degree is typically required for *Environmental Science and Protection Technicians, Including Health* and a bachelor's degree is typically required for *Occupational Health and Safety Specialists* (Exhibit 9).

Exhibit 9. Education, work experience, training, and Current Population Survey results for Environmental Health and Safety occupations[5]

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Environmental Science and Protection Technicians, Including Health	Associate degree	None	None	34%
Occupational Health and Safety Specialists	Bachelor's degree	None	None	31%
Occupational Health and Safety Technicians	High school diploma or equivalent	None	Moderate-term	31%

[5] "Labor Force Statistics from the Current Population Survey," Bureau of Labor Statistics, https://www.bls.gov/cps/.

Supply

An analysis of program data from the Integrated Postsecondary Education Data System (IPEDS) for the last three program years shows that, on average, 10 awards were conferred in the SCV/SML subregion (Exhibits 10 and 11).

Exhibit 10. TOP and CIP codes for Industrial/Occupational Safety and Health and related programs

TOP Titles	CIP Titles
0956.70 – Industrial and Occupational Safety and Health	15.0507 – Environmental/Environmental Engineering Technology/Technician 15.0508 – Hazardous Materials Management and Waste Technology/Technician 15.0703 – Industrial Safety Technology/Technician 15.0705 – Process Safety Technology/Technician

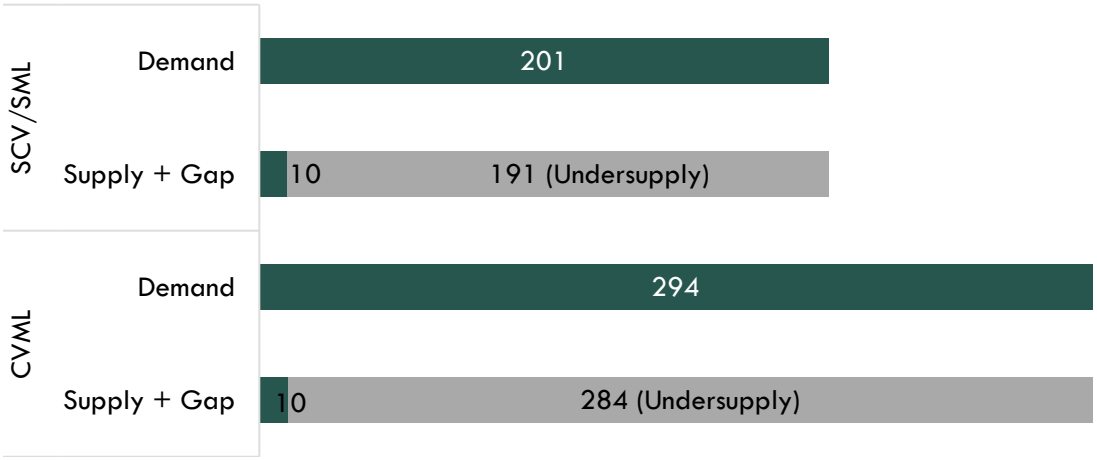
Exhibit 11. Postsecondary supply for Industrial and Occupational Safety and Health, Program Years 2019-20 through 2021-22

TOP/CIP Code- Title	College	Associate Degree	Certificate 60+ semester units	Certificate 30 < 60 semester units	Certificate 16 < 30 semester units	Certificate 8 < 16 semester units	Certificate 6 < 18 semester units	Total
0956.70 – Industrial and Occupational Safety and Health	Bakersfield*	3						3*
	Taft*	5					2	7*
SCV/SML TOTAL		**8**					**2**	**10**
CVML TOTAL		**8**					**2**	**10**

*SCV/SML awards

There is an undersupply of 191 workers in the SCV/SML subregion and an undersupply of 284 workers in the CVML region (Exhibit 12).

Exhibit 12. Workforce demand (annual job openings), postsecondary awards (supply), and additional students needed to fill gap in the SCV/SML subregion and CVML region



Recommendation

This report suggests there is a shortage of 191 Environmental Health and Safety workers in the SCV/SML subregion and a shortage of 284 workers in the CVML region. Based on these findings, it is recommended that Taft College work with the regional directors, the college's advisory board, and local industry in the development of programs to address the shortage of Environmental Health and Safety workers in the region.

Appendix: Methodology & Data Sources

Data Sources

Labor market and educational supply data compiled in this report derive from a variety of sources. Data were drawn from external sources, including the Economic Modeling Specialists, Inc., the California Community Colleges Chancellor's Office Management Information Systems Data Mart and the National Center for Educational Statistics (NCES) Integrated Postsecondary Education Data System (IPEDS). Below is the summary of the data sources found in this study.

Data Type	Source
Labor Market Information/Population Estimates and Projections/Educational Attainment	Economic Modeling Specialists, Intl. (LIGHTCAST). LIGHTCAST occupational employment data are based on final LIGHTCAST industry data and final LIGHTCAST staffing patterns. Wage estimates are based on Occupational Employment Statistics (QCEW and Non-QCEW Employees classes of worker) and the American Community Survey (Self-Employed and Extended Proprietors). Occupational wage estimates also affected by county-level LIGHTCAST earnings by industry: economicmodeling.com.
Typical Education Level and On-the-job Training	Bureau of Labor Statistics (BLS) uses a system to assign categories for entry-level education and typical on-the-job training to each occupation for which BLS publishes projections data: https://www.bls.gov/emp/tables/educational-attainment.htm.
LaunchBoard	Chancellor's LaunchBoard. https://www.calpassplus.org/LaunchBoard/SWP.aspx
Labor Force, Employment and Unemployment Estimates	California Employment Development Department, Labor Market Information Division: labormarketinfo.edd.ca.gov.
Job Posting and Skills Data	Lightcast: https://lightcast.io/.
Additional Education Requirements/ Employer Preferences	The O*NET Job Zone database includes over 900 as well as information on skills, abilities, knowledge, work activities and interests associated with specific occupations: onetonline.org.

Key Terms and Concepts

Annual Job Openings: Annual openings are calculated by dividing the number of years in the projection period by total job openings.

Education Attainment Level: The highest education attainment level of workers age 25 years or older.

Employment Estimate: The total number of workers currently employed.

Employment Projections: Projections of employment are calculated by a proprietary Economic Modeling Specialists, Intl. (LIGHTCAST) formula that includes historical employment and economic indicators along with national, state and local trends.

LaunchBoard (Attained the Living Wage): Among SWP students who exited college and did not transfer to any postsecondary institution, the proportion who attained the district county living wage for a single adult measured immediately following academic year of exit.

LaunchBoard (Median Annual Earnings): Among SWP students who exited the community college system and who did not transfer to any postsecondary institution, median earnings following the academic year of exit.

LaunchBoard (Median Change in Earnings): Among SWP students who exited and who did not transfer to any postsecondary institution, median change in earnings between the second quarter prior to the beginning of the academic year of entry and the second quarter after the end of the academic year of exit from the last college attended.

LaunchBoard (Job Closely Related to Field of Study): Among SWP students who responded to the CTE Outcomes Survey and did not transfer to any postsecondary institution, the proportion who reported that they are working in a job very closely or closely related to their field of study.

Living Wage: The cost of living in a specific community or region for one adult and no children. The cost increases with the addition of children.

Occupation: An occupation is a grouping of job titles that have a similar set of activities or tasks that employees perform.

Percent Change: Rate of growth or decline in the occupation for the projected period; this does not factor in replacement openings.

Replacements: Estimate of job openings resulting from workers retiring or otherwise permanently leaving an occupation. Workers entering an occupation often need training. These replacement needs, added to job openings due to growth, may be used to assess the minimum number of workers who will need to be trained for an occupation.

Total Job Openings (New + Replacements): Sum of projected growth (new jobs) and replacement needs. When an occupation is expected to lose jobs, or retain the current employment level, number of openings will equal replacements.

Typical Education Requirement: represents the typical education level most workers need to enter an occupation.

Typical On-The-Job Training: indicates the typical on-the-job training needed to attain competency in the skills needed in the occupation.

The new Curriculum Inventory System, launched in September 2012, has added new requirements to program proposals. Please fill out this form and include it with your degree or certificate submission.

Program Title: Disability Services Self Determination Program Independent Facilitator

Program TOP Code: 210450: Disability Services
The TOP code is assigned according to the content and outcomes of the program, and must conform closely to the TOP code given to similar programs in other colleges around the state. The TOP code reflects the main discipline or subject matter, thus the program TOP code will reflect the majority of required degree courses.

Annual Completers: 70
Number of students estimated to receive the degree or certificate each year after the program is fully established.

Program Goal: CTE – Workforce Preparation
Degree and Certificate programs may have the following specified program goals: Career Technical Education (CTE), Transfer, CTE & Transfer, and Other- Designed to meet community needs.

Net Annual Labor Demand (CTE only): Kern County: 9000; State of California: more than 400,000 – There are no low cost/no cost training programs available statewide. Any regional center client in California could hire an Independent Facilitator.
For CTE programs only, fill in the estimated number of annual job openings, minus the annual number of program completers of other programs within the counties in the college service areas. In most cases, this figure must cover only the counties within the college's service area but for occupations considered to have a larger regional or statewide training and recruitment area, the larger area may be used.

Faculty Workload: .3
Provide the number of full-time equivalent faculty that will be dedicated to teaching the courses in this program, in the program's first full year of operation, regardless of whether they are new or existing faculty. This estimate is not the number of FTES (full time equivalent students) expected to be generated by the program. The number must be entered as a decimal—for example, one and a quarter full-time equivalent faculty would be entered as 1.25.

New Faculty Positions: 0
Provide the number (not FTEF) of separately identified new positions, both part- and full-time. For example, if three part-time positions will be new, then enter the number 3 (three). If existing faculty are sufficient for offering the program with courses and no plans exist to hire new faculty, enter 0 (zero).

New Equipment: none
If new equipment will be acquired for this program, estimate (in dollars) the total cost from all sources, including district and state funds.

New/Remodeled Facility: none

If new or remodeled facilities will be acquired for this program, estimate (in dollars) the cost from all sources, including district and state funds.

Library Acquisitions: $1000
Provide the estimated cost (in dollars) of library and learning resources materials

Program Review Date: Disability Services Comprehensive Program Review every two years_____

Enter the month and year of the first scheduled review after it has been approved. For degrees/certificates with a program goal of ""Career Technical Education (CTE)" or "Career Technical Education (CTE) and Transfer," pursuant to Education code section 78016 the degree/certificate must be reviewed every two (2) years.

Gainful Employment:
Indicate if the program meets U.S. Department of Education gainful employment criteria. Not applicable for AA-T or AS-T degrees.

Apprenticeship: No
Select "No" if the program is not an apprenticeship. Select "Yes" if the program is an apprenticeship with approval from the Division of Apprenticeship Standards.

Distance Education: 100%
Indicate the extent to which the courses associated with the certificate are conducted via distance education; four choices are available, 0%, 1-49%, 50-99%, or 100%

CTE Regional Consortium Approved: N/A
For programs with a selected program goal of CTE or CTE and Transfer, by selecting "Yes" the college certifies that the certificate was approved by the CTE regional consortium. For a program with a selected goal that does not include CTE, this field is not required.

The new Curriculum Inventory System, launched in September 2012, has added new requirements to program proposals. Please fill out this form and include it with your degree or certificate submission.

Program Title: Disability Services Person-Centered Planning with Self Determination Program Participants

Program TOP Code: 21450: Disability Services
The TOP code is assigned according to the content and outcomes of the program, and must conform closely to the TOP code given to similar programs in other colleges around the state. The TOP code reflects the main discipline or subject matter, thus the program TOP code will reflect the majority of required degree courses.

Annual Completers: 70
Number of students estimated to receive the degree or certificate each year after the program is fully established.

Program Goal: CTE – Workforce Preparation
Degree and Certificate programs may have the following specified program goals: Career Technical Education (CTE), Transfer, CTE & Transfer, and Other- Designed to meet community needs.

Net Annual Labor Demand (CTE only): Kern County: 9000; State of California: more than 400,000 – There are no low cost/no cost training programs available statewide. Any regional center client in California could hire an Independent Facilitator.

For CTE programs only, fill in the estimated number of annual job openings, minus the annual number of program completers of other programs within the counties in the college service areas. In most cases, this figure must cover only the counties within the college's service area but for occupations considered to have a larger regional or statewide training and recruitment area, the larger area may be used.

Faculty Workload: .3
Provide the number of full-time equivalent faculty that will be dedicated to teaching the courses in this program, in the program's first full year of operation, regardless of whether they are new or existing faculty. This estimate is not the number of FTES (full time equivalent students) expected to be generated by the program. The number must be entered as a decimal—for example, one and a quarter full-time equivalent faculty would be entered as 1.25.

New Faculty Positions: 0
Provide the number (not FTEF) of separately identified new positions, both part- and full-time. For example, if three part-time positions will be new, then enter the number 3 (three). If existing faculty are sufficient for offering the program with courses and no plans exist to hire new faculty, enter 0 (zero).

New Equipment: _none__
If new equipment will be acquired for this program, estimate (in dollars) the total cost from all sources, including district and state funds.

New/Remodeled Facility: _none__
If new or remodeled facilities will be acquired for this program, estimate (in dollars) the cost from all sources, including district and state funds.

Library Acquisitions: _$500__
Provide the estimated cost (in dollars) of library and learning resources materials

Program Review Date: __Disability Services Comprehensive Program Review every two years. Fall 2027___
Enter the month and year of the first scheduled review after it has been approved. For degrees/certificates with a program goal of ""Career Technical Education (CTE)" or "Career Technical Education (CTE) and Transfer," pursuant to Education code section 78016 the degree/certificate must be reviewed every two (2) years.

Gainful Employment:
Indicate if the program meets U.S. Department of Education gainful employment criteria. Not applicable for AA-T or AS-T degrees.

Apprenticeship: No
Select "No" if the program is not an apprenticeship. Select "Yes" if the program is an apprenticeship with approval from the Division of Apprenticeship Standards.

Distance Education:__100%____
Indicate the extent to which the courses associated with the certificate are conducted via distance education; four choices are available, 0%, 1-49%, 50-99%, or 100%

CTE Regional Consortium Approved: N/A
For programs with a selected program goal of CTE or CTE and Transfer, by selecting "Yes" the college certifies that the certificate was approved by the CTE regional consortium. For a program with a selected goal that does not include CTE, this field is not required.

Narrative for Certificate of Completion in Self Determination Program: Independent Facilitator (IF)

Program Goals and Objectives

According to the 2023 State Council on Developmental Disabilities report, California needs to ensure there are enough well-trained independent facilitators to support participants in the Self Determination Program. The report states: “To strengthen IF capacity, we recommend that the state invest in their development, with a particular focus on recruiting IFs from underrepresented communities, including BIPOC (Black, Indigenous, People of Color) and individuals proficient in languages other than English.”

Offering a non-credit workforce preparation certificate for people wanting to become independent facilitators, either for themselves or for others, allows up to 300,000 Californians with intellectual and/or developmental disabilities to live more independent lives, directing their daily schedules with purpose. Currently, around 6,000 individuals are accessing these services, many struggling to overcome the program’s challenges because of a lack of professionals ready to support them.

Successful certificate earning students could be supporting themselves, supporting their loved ones, or creating a small business to support their community with person-centered independent facilitation services.

Catalog Description

To complete a Certificate of Completion in Self Determination Program: Independent Facilitator, students must complete the Self Determination Program Orientation and Foundation course and Self Determination Program Independent Facilitator.
Both courses in this certificate are offered on an open entry/open exit basis, which means you can start and finish the class at any time during a semester. All courses in this certificate are offered online.

Program Student Learning Outcomes

1. Demonstrate skills to support Self Determination Program participants
2. Demonstrate understanding of requirements of Independent Facilitators based on statute.

Program Requirements

To earn the Certificate of Completion in Self Determination Program: Independent Facilitator, student will complete two courses:

Course Title and Number	Hours
DS 0250: Self Determination Program Orientation (0 Units)	16
DS 0280: Self Determination Program Independent Facilitator (0 Units)	32

Master Planning

Taft College is committed to creating a community of learners by enriching the lives of all students we serve through career technical education, transfer programs, foundational programs, baccalaureate programs, and student support services. Taft College provides an equitable learning environment defined by applied knowledge leading to students' achievement of their educational goals.

Narrative for Certification of Completion in Self Determination Program: Person-Centered Planning (PCP)

Program Goals and Objectives

California's Self Determination Program (SDP) is a service delivery model for individuals served by the regional center system, the statewide system that serves people with intellectual or developmental disabilities. To enter the Self Determination Program, individuals need to complete an SDP Orientation, the first course of this two-course non-credit certificate.

Successful certificate earning students could be supporting themselves, supporting their loved ones, or creating a small business to support their community with person-centered planning, as it connects to the Self Determination Program.

Catalog Description

To complete a Certificate of Completion in Self Determination Program: Person-Centered Planning, students must complete this SDP Orientation and Foundation course and the course in Person-Centered Planning. All courses in this certificate are offered on an open entry/open exit basis, which means you can start and finish the class at any time during a semester.

This non-credit certificate has two courses needed to complete the Certification of Completion Self Determination Program: Person-Centered Planning. Students who successfully complete this two-course certificate can support people served by California's regional center system. To bill the regional center system, people providing person-centered planning services must provide proof of training in person-centered planning, and this two –course certificate will allow professionals to do that.

Program Student Learning Outcomes

1. Demonstrate creativity and critical thinking to support individuals who want to meet their life goals using the Self Determination Program.
2. Demonstrate person-centered planning skills.

Program Requirements

Required Courses to earn the Certificate of Completion in Self Determination Program: Person-Centered Planning are as follows:

Course Title and Number	**Hours**

DS 0250: Self Determination Program Orientation (0 Units)	16
DS 0260: Self Determination Program Person-Centered Planning (0 Units)	16

Master Planning

Taft College is committed to creating a community of learners by enriching the lives of all students we serve through career technical education, transfer programs, foundational programs, baccalaureate programs, and student support services. Taft College provides an equitable learning environment defined by applied knowledge leading to students' achievement of their educational goals.

Additionally, California's Master Plan for Developmental Services specifically states that the State will work directly with the California Community College system. This certificate supports both Taft College's mission and the goals of the Master Plan for Developmental Services.

TAFTCOLLEGE

Course Development Memo

To: Dr. Leslie Minor Chief Instructional Officer
Dr. Vicki Jacobi, Curriculum Co-Chair

From: Kanoe Bandy

Division: Applied Technologies

Date: 4/1/2025

Re: ENER COR updates

Type of Curriculum Change:

☐ New Course*
☒ Nonsubstantial Course Change*
☐ Substantial Course Change*
☐ Course Inactivation

For Course Changes, why is this course being updated?

☐ For C-ID

☐ As part of the 5 year review cycle

☒ Other (please explain): ENER 1503 and 1510 Updated SLO's and DE form

For New Courses, please enter a justification for the request:

Please enter a brief description of the background and rationale for the course. This might include a description of a degree or certificate for which the course is required or the relationship of this course to other courses in the same or other disciplines:

Click here to enter text.

Programs Affected/Stand Alone:

Please list all degrees and certificates affected:

SLOASC review date: _____

Distance Learning and Education Committee review date: _____ if requesting DLE.

☐ **Addition to Taft College General Education:**

*SLOs are required

☐ Natural Science ☐ Social & Behavioral Science ☐ English Composition

☐ Humanities ☐ Communication & Critical Thinking

Justification for Addition to Taft College General Education:

Please list the General Education SLOs this course meets:

Click here to enter text.

*SLOs are required

TAFTCOLLEGE

~~Prepared by: J. Carrithers~~
Prepared by: ~~D. Thornsberry~~
~~Prepared by: C. Sicari~~
Prepared by: T. Davis
Reviewed by: K.Bandy

Date Prepared: ~~August 2016~~ **Spring 2025**
C& GE approved: ~~January 12, 2017~~
Board approved: ~~February 8, 2017~~
Semester Effective: ~~Spring 2018~~

Formatted: Strikethrough
Formatted: Strikethrough
Formatted: Font: Bold, Underline
Formatted: Strikethrough
Formatted: Indent: Left: 4"
Formatted: Strikethrough
Formatted: Font: Bold, Underline
Formatted: Strikethrough
Formatted: Strikethrough
Formatted: Strikethrough

Energy (ENER) 1503 Environmental Awareness & Regulatory Compliance
(3 Units) CSU

Advisory: None.~~Eligibility for English 1000 and Reading 1005 strongly recommended~~

Total Hours: 48 hours lecture, 96 outside of class hours (144 Total Student Learning Hours)

Catalog Description: An overview of **the genesis for all major federal environmental laws in the United States. Additionally, all corresponding State of California environmental laws are reviewed and how they support and, in some cases, differ from their federal counterparts. Students are expected to have a general knowledge of how environmental statutes are promulgated on the State and Federal levels. Students are expected to be able to conduct legal research. Also, understand the ambiguity of statutes and regulations and why they are written that way. The class is divided into teams that have to conduct a semester long class project that identifies Federal, State and Local statutes/regulations that will be encountered during the project.**

Type of Class/Course: Degree/Credit

Text:
Bell, Christopher L., et al. *The Environmental Law Handbook*. 25th ed., Hart Publishing, 2025.
~~Bell, Christopher L., and F. William Brownell. The Environmental Law Handbook, 22nd ed., Bernan Press 2013~~

Additional Materials: -None.

Course Objectives:

By the end of the course a successful student will be able to:

1. understand the **evolution of environmental laws, from "toothless" beginnings to a compliance driven part of operating a business in the United States.**
2. **understanding the vagueness of how environmental laws are written and why they are left to interpretation.**
3. **understand and be able to explain the lifecycle of environmental statutes from inception to becoming law.**
4. **understand the differences between federal law and state law, citing some of the differences.**
5. **have a basic understanding of the government agencies (federal, state, local) and their roles and jurisdiction regarding environmental law.**
6. **understand the basic principles of the federal and state endangered species act. Including endangered species that live within Kern County.**

7. **have a basic knowledge of the Occupational Safety and Health Act and how it protects workers.**
8. **understand the purpose of NEPA and CEQA and how they interact with all of the major environmental laws.**

Course Student Learning Outcomes

1. ~~K~~ Demonstrate the ability to perform legal research using legal nomenclature to provide citations for federal, state and local environmental laws. (K-Knowledge)
2. ~~S~~ Use skills learned to interpret how environmental law is applied ~~on a case-by-case basis to strike a balance between protecting the environment and promoting public welfare~~to the environment and public welfare. (Skill- Psychomotor)
3. ~~A~~ Demonstrate the problem-solving skill required to ~~understand the complexity and intentional ambiguity of environmental law~~explain the complexity and ambiguity of environmental law. (A- Affective)
Course Scope and Content:

UNIT I **Introduction to Environmental Law**
- A. **Nomenclature of legal citations**
- B. **Ambiguity in which environmental law is written.**
- C. **Fundamental purpose of environmental law.**
- D. **Enforcement and liability of environmental law**

The genesis of environmental law; statutes, regulations, court decisions, common law, and the constitution.

UNIT II **Beginnings of Environmental Law**
- A. **Lack of "teeth" in original environmental laws.**
- B. **The Clean Water Act (CWA), Clean Air Act (CAA), and Safe Drinking Water Act (SDWA)**
- C. **The role that the State of California takes in enforcement of CWA, CAA, and SDWA**
- D. **-Establishment of standards for CWA, CAA, and SDWA.**

UNIT III **Environmental laws that regulate waste, environmental assessments and clean-ups.**
- A. **Resource Conservation and Recovery Act (RCRA), Oil Pollution Act (OPA), Comprehensive Environmental Response Compensation Act (CERCLA), and Toxic Substances Control Act (TSCA).**
- B. **The role that the State of California takes with implementing RCRA, OPA, CERCLA and TSCA -Standards and Priorities established by RCRA, OPA, CERCLA and TSCA.**

Unit IV **The "Magna Carta" of environmental laws; National Environmental Policy Act (NEPA) and its California counterpart California Environmental Quality Act (CEQA).**
- A. **How NEPA unites federal environmental laws helping them work together.**
- B. **How CEQA unites California environmental laws helping them work together.**
- C. **How NEPA and CEQA compare, contrast and help each other coordinate federal and state environmental laws.**

UNIT V **Climate Change and Environmental law**
- A. **History of climate change.**
- B. **Environmental laws aimed at climate change including Cap and Trade, and Carbon trading.**
- ~~C.~~ -

UNIT VI **The US Endangered Species Act (ESA) and the California Endangered Species Act (CESA)**
- A. **The basis for ESA and CESA.**
- B. **Differences between ESA and CESA.**

Formatted: Numbered + Level: 1 + Numbering Style: A, B, C, … + Start at: 1 + Alignment: Left + Aligned at: 0.5" + Indent at: 0.75"

Formatted: Font: Not Bold

Formatted: No bullets or numbering

C. **Incidental Take and penalties for violations of ESA and CESA.**

UNIT VII **The Occupational Safety and Health Act (OSHA) and California Occupational Safety and Health Act (CALOSHA)**

A. **Overview of OSHA**
B. **Overview of CALOSHA**
C. **Comparisons of OSHA and CAL OSHA include how they work together to make workers safe.**

UNIT VIII **The Toxic Substances Control Act (TSCA)**

A. **TSCA establishes restrictions, reporting requirements and warnings on a wide range of chemicals currently used and previously used in public products.**
~~B.~~ –

Formatted: Font: Not Bold

Formatted: Indent: Left: 0.75", No bullets or numbering

Learning Activities Required Outside of Class:

Students will spend a minimum of 6 hours per week outside of regular class time doing the following:

1. **Reading sections of the Textbook as provided by the professor.**
2. **Performing legal research as assigned by the professor.**
3. **Conducting research and working within designated teams to complete a semester long class project that interacts with various federal, state, and local agencies, laws and regulations.**

Methods of Instruction:

1. Lecture
2. Group Work
3. Class Discussions
4. Guest Presentations
5. Practical Exercises
6. Field Trips

Methods of Evaluation:

1. Exams
2. Quizzes
3. Presentations
4. Observations

Supplemental Data:

TOP Code:	095430: Petroleum Technology
SAM Priority Code:	C: Clearly Occupational
Distance Education:	~~Not Applicable~~ Online
Funding Agency:	Y: Not Applicable (funds not used)
Program Status:	1: Program Applicable

Noncredit Category:	Y: Not Applicable, Credit Course
Special Class Status:	N: Course is not a special class
Basic Skills Status:	N: Course is not a basic skills course
Prior to College Level:	Y: Not applicable
Cooperative Work Experience:	Y: Is part of a cooperative work experience education program
Eligible for Credit by Exam:	YES
Eligible for Pass/No Pass:	NO
Taft College General Education:	NONE
Discipline	Environmental Studies or Environmental Technologies or Environmental Engineering

TAFTCOLLEGE

~~Prepared by: J. Carrithers~~
Prepared by: T. Davis
Reviewed by: K. Bandy
Date reviewed~~: October, 2016~~
Spring 2025
Text Update: ~~October 2016~~
C & GE approved: ~~December 12, 2016~~
Board approved: ~~January 11, 2017~~
Semester Effective: ~~Spring 2018~~

Formatted: Strikethrough
Formatted: Strikethrough
Formatted: Font: Bold, Underline
Formatted: Strikethrough
Formatted: Strikethrough
Formatted: Strikethrough
Formatted: Strikethrough

Energy (ENER) 1510 Introduction to Energy (3 Units) CSU: UC

Advisory: ~~Eligibility for English 1500 and Math 1050 strongly recommended~~None

Total hours: 48 hours lecture. 96 Outside of class hours. (144 Total Student Learning Hours) 3 Units

Catalog Description**:** This course is a survey of the energy industry. **This course begins with a review of the evolution of energy and how we got to our current state.** The course is intended to provide an overall understanding of the various fields and types of energy, the role it plays in the national and global economy as well as challenges and opportunities. **This course differentiates between renewable and non-renewable energy sources and their role in our future.** . Field trips are required.

Type of Class: Degree credit

Text:

McElroy, Michael B. *Energy: Perspectives, Problems, and Prospects.* Oxford U P, 2009.

~~McElroy, Michael B. *Energy: Perspectives, Problems, and Prospects.* New York: Oxford University Press, 2010. Print~~

Additional Instructional Materials: NONE

Course Objectives:

By the end of the course, a successful student will be able to

1. **understand the limited resources of non-renewable energy and the need for alternative energy sources to maintain a current lifestyle.**
2. **understand the advantages and disadvantages of renewable energy sources.**
3. **identify some of the risks associated with nuclear and geothermal sources of energy.**
4. **Determine a path forward to transition from nonrenewable to renewable energy sources.**

Course Student Learning Outcomes:
1. ~~K~~ Demonstrate knowledge of ~~the~~ historical ~~evolution of energy use by humans. (K Knowledge)~~ energy use by humans to transition to renewable energy sources.

TAFTCOLLEGE

2. ~~S – Use skills learned to help identify what sources of energy will be used to replace non-renewable sources of energy. (Skill-Psychomotor)~~Evaluate alternative sources of energy that can be used to replace non-renewable sources of energy.
~~3. A – Demonstrate teamwork, problem solving, and trouble shooting skills for new sources of renewable energy and how to develop those resources. (A – Affective)~~

Course Scope and Content:

Unit I **Energy Sources**
- A. A Brief History of **Energy** Sources
- **B. Renewable vs. Non-renewable energy sources**

Unit II Electricity
- A. Overview
- B. Sources and Uses

Unit III Hydroelectricity
- A. Overview
- B. Sources and Uses

Unit IV Wind Energy
- A. History
- B. Characteristics and Resource Assessment
- C. Aerodynamics
- D. Structures and Loads
- E. Operations and Maintenance
- F. Electrical
- G. Environmental
- H. Grid Integration

Unit V Solar Energy
- A. Overview
- B. Sources and Uses

Unit VI Steam and Geothermal Energy
- A. Overview
- B. Sources and Uses

Unit VII **Nuclear Energy**
- **A. History**
- **B. Current Use**
- **C. Concerns**

Unit VIII **Emerging forms of energy**
- **A. What is new.**
- B. **Feasibility**

Unit IX **History and future of petroleum energy sources**
- **A. Petroleum Reserves**
- **B. Transition to renewables**

TAFTCOLLEGE

Unit X Uses for Alternative Energy Sources
A. Options

Development Learning Activities Required Outside of Class:

The students in this class will spend a minimum of 6 hours per week outside of the regular class time doing the following:

1. Reading the required text and other background materials
2. Answering questions
3. Studying class materials and notes
4. Researching
5. Problem solving activities and exercises
6. Field trips to Kern Country alternative energy operations
7. Written reports

8. Class Project

Method of Instruction:

1. Lecture and discussion
2. Guest lecture and presentations from energy company representatives
3. Outside activities including field exploration/trips to energy companies and production sites as needed
4. Group activities and projects

Method of Evaluation:

1. Written assignments, including:
   a. reports, written assignments

2. Exams and quizzes:
   a. computational or non-computational problem-solving demonstrations
   b. multiple choice; true/false; matching

3. Skills demonstrations, including:
   a. class performance

4. Participation
   a. class and group activities
   b. field trips

Supplemental Data:

TAFTCOLLEGE

TOP Code:	095430: Petroleum Technology ~~and~~
SAM Priority Code:	C: Clearly Occupational
Distance Education:	Online
Funding Agency:	Y: Not Applicable
Program Status:	1: Program Applicable
Noncredit Category:	N:
Special Class Status:	N: Course is not a special class
Basic Skills Status:	N: Course is not a basic skills course
Prior to College Level:	Y: Not Applicable
Cooperative Work Experience:	Y: is part of a cooperative work experience education program
Eligible for Credit by Exam:	YES
Eligible for Pass/No Pass:	NO
Discipline:	Environmental Studies or Engineering Technology or Ecology

Formatted Table

Formatted Table

TAFT COLLEGE
West Kern Community College District

~~Prepared by: R.Adams~~
Prepared by T Davis
Reviewed by: K.Bandy
~~Reviewed by: S.Aunai~~

Date Prepared: ~~Jan 2012~~ **Spring 2025**

Energy (ENER) 0525~~1025~~ Oil and Gas Laws and Regulations (1 Unit)

Advisory: None ~~Eligibility for English 1000 and Reading 1005 strongly recommended~~

Total Hours: 16 hours lecture, 32 Outside of class hours (48 Total Student Learning hours)

Catalog Description: This course is an overview of the **Federal, State and Local** laws and regulations governing oil and gas operations in California **including** ~~and~~ the regulatory agencies that implement them.

Type of Class/Course: Degree/Credit

Text: None

Additional Materials: None

Course Objectives:

By the end of the course a successful student will be able to:

1. Understand legal nomenclature, able to identify citations, and conduct legal research,
~~1.~~2. understand the **meaning and intent of laws** ~~justification and authority for the laws~~ and regulations in the oil & gas industry,
~~2.~~3. use the laws and regulations as a reference,
~~3.~~4. identify and ~~demonstrated~~**demonstrate jurisdiction** ~~familiarity with the~~ ~~relevant~~**of relevant** government agencies.

Course Student Learning Outcomes:

1. **K – Demonstrate an understand of laws (Federal, State, Local) that govern the oil and gas industry. (K- Knowledge)**
2. **S – Use skills learned to conduct legal research on oil and gas laws and regulations. (Skill – Psychomotor)**
3. **A – Demonstrate an understanding of why oil and gas laws are written with ambiguity to they can be interpreted and applied on a case-by-case basis. (A- Affective)**

Course Scope and Content (Lecture):

Unit I **Laws that govern the petroleum industry** ~~California's petroleum laws and regulations~~

A. Origin, basis and authority
B. Public Resource Code - the laws
C. California Code of Regulations - the regulations
D. Other agency laws and regulations: Federal, ~~and~~ state, **local**

Formatted: Strikethrough
Formatted: Font: Bold
Formatted: Right
Formatted: Strikethrough
Formatted: Indent: Left: 2.5"
Formatted: Strikethrough
Formatted: Not Strikethrough
Formatted: Font: Bold, Underline
Formatted: Font: Bold
Formatted: Font: Bold
Formatted: Font: Bold
Formatted: Font: Bold
Formatted: Font: Bold
Formatted: Font: Bold
Formatted: Font: Bold
Formatted: Font: Bold
Formatted: Font: Bold
Formatted: Font: Bold
Formatted: Font: Bold
Formatted: Font: Bold
Formatted: Font: Bold
Formatted: Font: Bold
Formatted: Numbered + Level: 1 + Numbering Style: 1, 2, 3, … + Start at: 1 + Alignment: Left + Aligned at: 0.25" + Indent at: 0.5"
Formatted: Font: Bold
Formatted: Font: Bold
Formatted: Font: Bold
Formatted: Font: Bold

Unit II Government Agencies

~~A. California Division of Oil, Gas and Geothermal Resources~~

A. CalGEM

B. Federal Bureau of Land Management

C. ~~California Water Quality Control~~ **Regional Water Quality Control Board**

D. Counties and Local Agencies

E. San Joaquin Valley Air Pollution Control District

Learning Activities Required Outside of Class:

Students will spend a minimum of 2 hours per week outside of regular class time doing the following:

1. Completing assignments
2. Reading applicable industry regulations

Methods of Instruction:

1. Lecture **and discussion**
2. Group Work
3. Class Discussions
4. Guest Presentations

Methods of Evaluation:

1. Exams
2. Quizzes
3. Presentations
4. Observations

Supplemental Data:

TOP Code:	095430: Petroleum Technology
SAM Priority Code:	C: Clearly Occupational
Distance Education:	Not Applicable
Funding Agency:	Y: Not Applicable(funds not used)
Program Status:	1: Program Applicable
Noncredit Category:	Y: Not Applicable, Credit Course
Special Class Status:	N: Course is not a special class
Basic Skills Status:	N: Course is not a basic skills course

Prior to College Level:	Y: Not applicable
Cooperative Work Experience:	N: Is not part of a cooperative work experience education program
Eligible for Credit by Exam:	Yes~~NO~~
Eligible for Pass/No Pass:	Yes~~NO~~
Taft College General Education:	NONE
Discipline:	Environmental Studies or Engineering Technologies or Ecology

TAFT COLLEGE
West Kern Community College District

~~Updated by:~~ ~~R. Chambers~~
Updated by: **T Davis**
~~Reviewed by:~~ ~~S. Aunai~~
Reviewed by: K. Bandy
Date reviewed: ~~May 5, 2014~~
Spring 2025~~4~~
C&GE approved: ~~May 12, 2014~~
Board approved: ~~June 11, 2014~~

Energy (ENER) 1515 Fundamentals of Instrumentation for Energy Industries (3 Units) CSU
[formerly Energy 1010]

Advisory: ~~Eligibility for Math 1060 and English 1500 strongly recommended~~None

Total Hours: 48 hours lecture, 96 Outside of Class hours (144 Total Student Learning Hours)

Catalog Description: This course is designed to provide students with a basic understanding of instrumentation **that applies to a broad range of applications. This course places a premium on understanding the dangers and hazards associated with electricity.** ~~and processes that provide energy and oil and gas industries vital information needed to monitor and improve production, and improve safety and efficiency.~~ ~~Fieldtrips~~Field trips may be required. ~~Course is not open to students who have credit of 'C' or better in ENER 1010.~~

Type of Class: Degree Credit

Text: ~~McNair, Will L. *Basic Instrumentation.* 4th ed. Austin: U of Texas, 2002. Print.~~
Northrop, Robert B., *Introduction to Instrumentation and Measurement*, 2017

Center for the Advancement of Process Technology. *Instrumentation*. Upper Saddle River: Prentice Hall, 2010. Print.

Additional Instructional Materials: ~~Industry resources and materials~~None

Objectives:

By the end of the course, a successful student will be able to:

1. demonstrate a basic understanding of instrumentation, **including the hazards associated with electricity and pneumatic controls.** ~~and their role in the energy, oil and gas industries.~~
2. ~~identify instruments used to measure and control pressure, temperature, level and flow~~
3. ~~define key terms such as gravity, viscosity, density and pH.~~
4. **define the elements of a control system and how they work together.** ~~explain the processes of measurement, control of flow, pressure and temperature and level, and~~
2. ~~demonstrate the ability to verify accuracy of transmitters, and calibrate using hand held calibrator.~~
3. **explain the processes of measurement, control of flow, pressure, temperature, and level.**
4. **understand the differences between pneumatic automatic controls and electronic automatic control systems.**

Formatted: Strikethrough
Formatted: Font: Bold
Formatted: Font: Bold
Formatted: Strikethrough
Formatted: Strikethrough
Formatted: Font: Bold, Underline, Strikethrough
Formatted: Font: Bold, Underline
Formatted: Strikethrough
Formatted: Strikethrough
Formatted: Font: Bold
Formatted: Font: Bold
Formatted: Font: Bold, Italic
Formatted: Font: Bold
Formatted: Font: Bold
Formatted: Font: Bold
Formatted: Font: Bold
Formatted: Font: Bold

TAFT COLLEGE
West Kern Community College District

5. demonstrate a basic understanding of programable logic controllers.

Course Student Learning Outcomes

1. K – Demonstrate knowledge regarding the hazards of working with electricity and controls that can pose a hazard to humans and the mitigations that keep them safe. (K-Knowledge).
2. S – Use skills to determine how variables like flow, pressure, temperature and level are measured and controlled to achieve a desired function. (Skill-Psychomotor)
3. A – Demonstrate problem solving skills to select the right components that will successfully control a process. (A- Affective)

Course Scope and Content:

Unit I Measurements

A. Need for ~~Measurement and~~Measurement and Control
B. Methods of Measurement
C. Types of Control
D. Methods or Modes of Control
E. Types of Measurements
   a. comparison of systems of units
   b. measuring length
   c. measuring time
   d. measuring temperature
   e. measuring mass, weight and force
   f. measuring work and energy
   g. measuring dimensions of various quantities

Unit II Final Control Elements

A. Valves
B. Sizing and Piping Arrangements
C. Actuators
D. Controlled-Volume Pumps
E. Variable-Volume Pumps
F. Other Final Control Elements

Unit III Electronic Automatic Controls

A. Analog Circuits and Equipment
B. Modes of Control and Control Loops
C. Programmable Logic Controllers (PLC) Control Systems
D. Specialized Flow Computers
E. Distributed Control Systems
F. Human-Machine-Interface (HMI)

Unit IV Pressure Measurement and Control

Formatted: Font: Bold

Formatted: Font: Bold

A. Units of Pressure Measurement
B. Mechanical Pressure Elements
C. Electronic Pressure Measure
D. Vacuum Measurements
E. Pressure Controls

Unit V Temperature Measurement and Control

A. Defining Temperature Measurement
B. Mechanical Temperature Sensors
C. Electronic Temperature Measurement
D. Electronic Temperature Transmitters
E. Temperature Control

Unit VI Liquid-Level Measurement and Control

A. Defining Level Measurement
B. Mechanical Level Sensors
C. Electrical Level Measuring Devices
D. Level Control
E. Flow Measurement
   a. mechanical flow sensors and meters
   b. electronic flow sensors and meters

Unit VII Gravity, Viscosity, Humidity and pH

A. Measuring Specific Gravity and Density
B. Measuring Viscosity
C. Measuring Humidity and Dew Point
D. Measuring pH

Unit VIII Programmable Logic Controllers (PLC)

A. PLC Operating Concepts
B. PLCS Brands
C. PLC Application and Loop Tuning

Unit IX Piping and Instrument Design (P&ID)

A. Instrumentation and Designations
B. Mechanical Equipment with Names and Valves
C. Valves
D. Process Piping, Sizes, Identification
E. Vents, Drains, Special Fitting, Sampling Lines, Reducers, Increasers, Swaggers
F. Permanent Start Up and Flush Lines
G. Interconnection Reference
H. Seismic Category
I. Quality Level
J. Annunciation Inputs
K. Computer Control System Input

L. Vendor and Contractor Interfaces
M. Identification of Components and Subsystems
N. Intended Physical Sequence of the Equipment

Learning Activities Required Outside of Class:

The students in this class will spend a minimum of 6 hours per week outside of the regular class time doing the following:

1. Reading the required text and other background materials for class
2. Answering questions
3. Studying class materials and notes
4. Researching
5. Problem solving activities and exercises

Methods of Instruction:

1. Lecture
2. Hands-on demonstrations of instruments including field trips as needed
3. Group Activities
4. Guest Presentations

Methods of Evaluation:

1. Written assignments/reports
2. Exams and quizzes:
   a. Multiple choice, true/false
   b. Diagram matching
   c. Read and generate charts used in oil industry
3. Participation
4. Individual and group exercises & projects
5. Practical Observation

Supplemental Data:

TOP Code:	094610: Energy Systems Technology
SAM Priority Code:	C: Clearly Occupational
Distance Education:	Not Applicable
Funding Agency:	Y: Not Applicable(funds not used)
Program Status:	1: Program Applicable

Noncredit Category:	Y: Not Applicable, Credit Course
Special Class Status:	N: Course is not a special class
Basic Skills Status:	N: Course is not a basic skills course
Prior to College Level:	Y: Not applicable
Cooperative Work Experience:	N: Is not part of a cooperative work experience education program
Eligible for Credit by Exam:	NO
Eligible for Pass/No Pass:	C: Pass/No Pass
Taft College General Education:	NONE
Discipline:	Environmental Studies or Environmental Technologies or Ecology

TAFTCOLLEGE

~~Prepared by: J. Lehman P.E.~~
~~Prepared by: J. Carrithers~~
Prepared by T. Davis
Reviewed by: K. Bandy
Date reviewed: ~~Oct 2016~~ **Spring 2025**
C & GE approved: ~~December 12, 2016~~
Board approved: ~~January 11, 2017~~
Semester effective: ~~Spring 2018~~

Energy (ENER) 1520 Introduction to Petroleum Technology (3 Units) CSU

Advisory: None~~Eligibility for Math 1060 and English 1500 strongly recommended~~ Total Hours: 48 hours lecture, 96 Outside of Class Hours (144 Total Student Learning Hours)

Catalog Description: This course is a comprehensive introduction to the engineering and business challenges that pertain to the exploration and production of oil and natural gas. The course addresses the many fundamental topics within the main sub-disciplines of Petroleum Engineering: reservoir, drilling, production and operations, facilities, and project economics. Field trips may be required.

Type of Class/Course: Degree Credit

Text: ~~Leffler, William and M. Raymond. *Oil and Gas Production in Nontechnical Language*. Tulsa, OK: Pen Well Corporation, 2006. Print.~~

Raymond, Martini S., and William L. Leffler. *Oil and Gas Production in Nontechnical Language*. 2nd ed., PennWell, 2017.

~~**Leffler, William. *Oil and Gas Production in Nontechnical Language*. Second Edition Pen Well Corporation 2017**~~

Course Objectives:

By the end of the course a successful student will be able to:

1. demonstrate an understanding of the fundamental theories, principles, and practices in reservoir engineering, production and operations engineering, drilling engineering, and facilities engineering,
2. demonstrate an understanding of the theories, principles, and practices associated with project economics in petroleum engineering systems,
3. demonstrate foundation knowledge of petroleum engineering to further education and career options.

Course Student Learning Outcomes

1. K – Demonstrates a general understanding of how an oil and gas production company operates. (K-Knowledge)
2. S – Use skills learned to overcome the operational challenges associated with the production of oil

Formatted: Strikethrough
Formatted: Strikethrough
Formatted: Strikethrough
Formatted: Font: Bold, Underline
Formatted: Strikethrough
Formatted: Strikethrough
Formatted: Strikethrough
Formatted: Font: Bold

TAFTCOLLEGE

and gas. (Skill – Psychomotor)
3. A – Demonstrate the ability to identify the various agencies (Federal, State, Local) that regulate oil and gas exploration and production in Kern County. (A Affective)

Course Scope and Content (Lecture):

Unit I Introduction
A. Engineering disciplines~~: petroleum~~: **petroleum**, mechanical, chemical, civil, electrical, others
B. Units of measurements and dimensional analysis
C. Oilfield units of measurements
D. Significant digits. Precision versus accuracy

Unit II Petroleum Industry Overview
A. Downstream: oil refining, petrochemical manufacturing, retailing
B. Midstream: transporting oil, natural gas, and petroleum liquids
C. Upstream: exploration and production of oil and natural gas

Unit III Petroleum Geology
A. Geologic time, plate tectonics, minerals and rock types
B. Origin, formation, and migration of oil and natural gas
C. Depositional environments; basins of California
D. Reservoirs: structural and stratigraphic traps
E. Subsurface mapping Cross-sections

Unit IV Reservoir Fluids
A. Hydrocarbon types; chemical and structural formulas of hydrocarbons
B. Equations of state: Boyle's, Charles', Avogadro's equations, ideal and real gases
C. Phase behavior: bubble point, dew point, critical point
D. Petroleum fluid categories: black oil, volatile oil, retrograde gas, wet gas, dry gas
E. Viscosity, specific gravity, volume factors, compressibility

Unit V Reservoir Rock Properties
A. Rock mechanics parameters: stress, strain, Poisson's Ratio, Young's Modulus
B. Conventional and special core analysis
C. Porosity, compressibility

Unit VI Reservoir Rock and Fluid Relationships
A. Fluid saturations
B. Wettability, capillary pressure
C. Darcy flow equation. Absolute, effective, and relative permeability

Unit VII Well Logs and Formation Evaluation
A. Electric Logs: SP, resistivity, dip meter. Fluid saturation determination
B. Radioactivity Logs: gamma ray, neutron, density
C. Sonic logs and determination of rock properties
D. Production Logs

Unit VIII Exploration Methods

Formatted: Font: Bold

A. Magnetic and gravity surveys
B. Seismic surveying and evaluation
C. Exploration Drilling

Unit IX Drilling
A. Rig components and systems
B. Fluids, cements, bits
C. Pressure and temperature gradients
D. Mud logging, drill stem tests, formation tests, coring
E. Casing installation
F. Directional drilling methods and tools

Unit X Well Completions, Recompletions, and Repairs
A. Perforating, hydraulic fracturing, acidizing
B. Coil tubing operations
C. Tubing, packers, plugs, cement squeezes
D. Plugging and Abandoning

Unit XI Oil and Gas Recovery Methods
A. Primary drive mechanisms: volumetric, solution gas, water, gas cap
B. Secondary and enhanced oil recovery methods: steam, water, and CO2 flooding

Unit XII Artificial Lift Methods
A. Rod lift: pumping unit components, rods, pumps
B. Gaslift ESP's
C. Progressive Cavity Pumps

Unit XIII Production Facilities
A. Separators: two phase, three phase, vertical, and horizontal. Free water knockouts
B. Dehydration: heater treaters, glycol reboilers
C. Production flowlines, liquid and gas gathering piping
D. Corrosion control, emulsion treating, hydrate formation and control
E. Natural gas compression and gas treatment plants
F. Measurement and metering, storage, water disposal

Unit XIV Economic Evaluation of Petroleum Projects
A. Land management terms~~: Working Interest, NRI, primary term, lease bonus, royalty terms~~
B. Discounting and Time Value of Money
C. Financial terms and metrics~~: capex, opex, NPV, IRR, PI, Payout~~
D. Evaluation of multiyear projects
E. Reserves classifications~~: proved, unproved, contingent resources~~
F. Reserves estimation methods~~: in place volumes and recovery factors, volumetric, DCA, material balance~~

Learning Activities Required Outside of Class:

The students in this class will spend a minimum of 6 hours per week outside of the regular class time doing the following:

1. Studying assigned text, handout materials and class notes

TAFTCOLLEGE

2. Reviewing and preparing for quizzes, midterm and final exams
3. Completing group projects

Methods of Instruction:

1. Lecture and discussions
2. Group activities/projects
3. Field trips (oil and gas production activities)

Methods of Evaluation:

1. Quizzes
2. Exams
3. Participation
4. Individual and group exercises & projects

Supplemental Data:

Formatted: Tab stops: Not at 0.57"

TOP Code:	095430: Petroleum Technology and
SAM Priority Code:	C: Clearly Occupational
Funding Agency:	Y: Not Applicable
Program Status:	1: Program Applicable
Noncredit Category:	Y: Not Applicable, Credit Course
Special Class Status:	N: Course is not a special class
Basic Skills Status:	N: Course is not a basic skills course
Prior to College Level:	Y: Not Applicable
Cooperative Work Experience:	N: Is not part of a cooperative work experience education program
Eligible for Credit by Exam:	Y:
Eligible for Pass/No Pass:	Y~~N~~:
Discipline:	Environmental Studies or Engineering Technologies or Ecology

TAFTCOLLEGE

TAFTCOLLEGE

~~Prepared by:~~	~~K. Olson~~
Prepared by:	T. Davis
Reviewed by:	K. Bandy
~~Reviewed by:~~	~~D. Layne~~
Textbook update:	~~Nov. 2014~~
Date prepared:	~~Fall 2016~~
Spring 2025	
C& GE approved:	~~May 8, 2017~~
Board approved:	~~June 14, 2017~~
Semester Effective:	~~Spring 2018~~

Formatted: Strikethrough
Formatted: Strikethrough
Formatted: Strikethrough
Formatted: Font: Bold, Underline
Formatted: Strikethrough
Formatted: Strikethrough
Formatted: Strikethrough

Energy (ENER) 1530 Electricity and Basic Electronics (3 Units) CSU

Advisory: ~~Eligibility for Math 1060 and English 1500 strongly recommended~~None Total Hours: 44 hours lecture, 88 Outside of Class hours;

18 hours lab (150 Total Student Learning Hours~~62 hours total~~)

Catalog Description: This course teaches the fundamentals of electricity and electronics. It covers a wide range of topics such as test equipment, electrical properties, units of measure, fundamental electrical laws, magnetism, relays and ladder diagrams, and both AC and DC components and circuit schematics. This course provides a solid foundation for both traditional and emerging electrical/electronic career paths.

Type of Class/Course: Degree Credit

Text: ~~Matt, Stephen R. *Electricity and Basic Electronics*. 8th ed., Goodheart-Willcox, 2012.~~

Gerrish, Howard H., et al. *Electricity & Electronics*. 11th ed., revised, textbook, Goodheart-Willcox, 2020.

~~**Gerrish, Howard H., *Electricity & Electronics*, Eleventh Edition, Goodheart-Willcox; 2020**~~

Formatted: Font: Bold

Course Objectives:

By the end of the course a successful student will be able to:

1. Demonstrate knowledge of the three things required any completed circuit,
2. Demonstrate understanding what is meant by open and closed circuits and short (including "short" and "ground"),
3. Demonstrate understanding of the direction and speed of electron flow in a completed circuit,
4. Demonstrate understanding in how electricity is produced,
5. Demonstrate understanding of how wire size is measured, the different gauges of wire, and their practical applications),
6. Demonstrate understanding why fuses are used to protect circuits, the different types of fuses (homes, industrial machinery, lab devices),
7. Demonstrate understanding of the process of soldering wire and the use of a heat sink,
8. Demonstrate understanding of how a resistor works and what it does,
9. Demonstrate understanding of how a capacitor works and what it does,
10. Demonstrate understanding of the two basic principles of magnetism,

11. Demonstrate understanding of the concept of a P-N junction,
12. Apply circuit and analysis methods for DC and AC circuits with various components using Ohm's Law, Watt's Law, and Kirchoff's Laws,
13. Demonstrate the understanding of how a multimeter is used to measure current, voltage and resistance in circuits, and
14. ~~Demonstrate proper safety principles~~**Identify the hazards and protections to assure safety at all times when dealing with electricity.**

Course Student Learning Outcomes

1. K – Demonstrate a comprehensive understanding of electrical hazards and be able to mitigate any electrical hazard by completing a Job Safety Analysis (JSA). (K-Knowledge)
2. S – Use skills to complete a circuit using all of the required components to achieve the desired outcome. (Skill- Psychomotor)
3. A – Demonstrate problem solving and trouble shooting skills to identify any breakdowns in the circuit caused by faulty components or improper application. (A – Affective)
4. A – Demonstrate an understanding of the differences between Alternating Current (AC) and Direct Current (DC) along with the benefits and challenges associated with each form of electricity. (A – Affective).

Formatted: Font: Bold

Formatted: Font: Bold

Formatted: Font: Bold

Course Scope and Content (Lecture):

Unit I Learning and Applying the Fundamental
- A. Uses of Electricity
- B. Basic Circuit Concepts
- C. The Chemistry of Electricity
- D. Advances in Electricity

Unit II Sources of Electricity
- A. Electricity from Chemical Energy
- B. Electricity from Light Energy
- C. Electricity from Pressure
- D. Electricity from Heat
- E. Electricity from Magnetism

Unit III Conductors and Insulators
- A. Wire
- B. Fuses
- C. Switches
- D. Wire Insulation
- E. Soldering
- F. Electrical Codes
- G. Superconductors

Unit IV Resistors and Capacitors
- A. Resistors
- B. Capacitors

Unit V Ohm's Law
- A. Three Variables of Ohm's Law
- B. Using Ohm's Law

C. Power
D. Kilowatt-Hours
E. Body Resistance

Unit VI Series Circuits
A. Current in a Series Circuit
B. Resistance in a Series Circuit
C. Capacitance in a Series Circuit
D. Polarity
E. Continuity Tester
F. Voltage Drop

Unit VII Parallel Circuits
A. Current in a Parallel Circuit
B. Resistance in a Parallel Circuit
C. Voltage in a Parallel Circuit
D. Calculating Current
E. Capacitance in a Parallel Circuit
F. Uses for Parallel Circuits
G. Drawing Parallel Circuits
H. Parallel Power Sources
I. Equal Resistor in Parallel
J. Measuring Voltage in a Parallel Circuit

Unit VIII Series-Parallel Circuits
A. Lightning
B. Resistance in a Series-Parallel Circuit
C. Circuit Analysis
D. Series-Parallel Capacitors
E. Ground
F. Voltage Divider
G. Wheatstone Bridge

Unit IX Multimeters
A. Analog Multimeters
B. Digital Multimeters
C. Accuracy of Readings

Unit X Magnetism
A. Basic Principles of Magnetism
B. Magnetic Materials
C. Magnetic Lines of Force
D. Generating Electricity with Magnetism
E. Creating Magnetism with Current

Unit XI Alternating Current
A. How AC is Produced
B. Sine Waves
C. Square Waves
D. Sine Waves and Sound
E. Signal Generators

F. Oscilloscopes
G. Measuring Unknown Frequencies
H. Phase Relationship
I. Generators
J. Eddy Currents

Unit XII Electromagnetic Induction
A. Induced Voltage
B. Inductance
C. Inductors
D. Inductors in Series
E. Inductors in Parallel
F. Mutual Inductance
G. Transformers

Unit XIII Motors
A. What is a Motor?
B. Basic Motor Operation
C. Classifying Motors
D. DC Motors
E. Induction Motors
F. Synchronous Motors
G. Motor Maintenance and Troubleshooting
H. Motor Selection
I. Current Draw

Unit XIV Reactance and Impedance
A. Inductive Reactance
B. Phase between Voltage and Current
C. Impedance
D. Phase Angle
E. Transformer Loading
F. Capacitive Reactance and Impedance

Unit XV LCR Circuits
A. Simple LCR Circuits
B. Resonance
C. High Definition Ratio

Unit XVI Filters
A. Band-Pass Filter
B. Band-Stop Filter
C. High-Pass Filter
D. Low-Pass Filter
E. Power Supply Filter
F. Filter Arrangements

Unit XVII Diodes
A. Diodes and Hole Flow
B. Diodes in Circuits
C. Zener Diodes

D. Light Emitting Diodes
E. Power Supplies

Unit XVIII Transistors
A. Bipolar Junction Transistors
B. Transistor Functions
C. BJT Configurations
D. Field Effect Transistors
E. Phototransistors
F. Transistor Data
G. Heat Sinks and Transistors

Unit XIX Thyristors
A. Silicon-Controlled Rectifiers
B. DIACs

Unit XX Integrated Circuits
A. Advantage of Integrated Circuits
B. Types of Integrated Circuits
C. IC Manufacturing
D. Logic Gates
E. Printed Circuit Boards

Unit XXI Fiber Optics
A. Fiber Optics Technology
B. Advantages of Fiber-Optic Cable
C. Disadvantages of Fiber-Optic Cable
D. Splicing Fiber-Optic Cable
E. Future of Fiber Optics

Unit XXII Switches
A. Relays
B. Solenoids

Course Scope and Content (Laboratory):

Unit I Fundamental Application
A. Identify and explain electricity
B. Identify symbols for and explain conductors and insulators
C. Identify symbols for and explain resistors and capacitors
D. Use Ohm's Law
E. Explain and demonstrate lab and electricity safety

Unit II Practical Application of Circuits
A. Design and create series circuits
B. Design and create parallel circuits
C. Design and create series-parallel circuits
D. Use multi-meters to analyze circuits and their components
E. Demonstrate and explain principles of magnetism
F. Demonstrate and explain alternating current
G. Demonstrate and explain relays and ladder diagrams

H. Explore industry application examples and exercises
I. Perform troubleshooting in nonfunctional circuits

Unit III Electromagnetic
A. Induce an electrical current
B. Diagram and explain the functions of a transformer

Unit IV Motors
A. Explain components, operation, and basic control of a motor
B. Identify types of motors
C. Identify motor fuses
D. Explain motor use in industry

Unit V Reactance and Impedance and LCR Circuits
A. Calculate – reactance and impedance of circuits
B. Calculate – impedance of an LCR circuit
C. Design resonant circuit
D. Explore examples of circuit use in industry

Unit VI Filters, Diodes, Transistors
A. Design a circuit to filter unwanted frequencies
B. Design a DC power supply circuit – diodes used
C. Design a switching and amplifying transistor circuit

Learning Activities Required Outside of Class:

The students in this class will spend a minimum of 6 hours per week outside of the regular class time doing the following:

1. Studying assigned text, handout materials and class notes
2. Reviewing and preparing for quizzes, midterm and final exams
3. Completing group projects

Methods of Instruction:

1. Lecture and discussions
2. Group activities/projects
3. Field trips (places of business including oil and gas production activities)
4. Lab activities & exercises

Methods of Evaluation:

1. Quizzes
2. Exams
3. Class Participation
4. Practical Observations
5. Individual and group exercises & projects
6. Written reports based on field applications

Laboratory Category: Extensive Laboratory

TAFTCOLLEGE

Pre delivery criteria: All of the following criteria are met by this lab.
1. Curriculum development for each lab.
2. Published schedule of individual laboratory activities.
3. Published laboratory activity objectives.
4. Published methods of evaluation.
5. Supervision of equipment maintenance, laboratory setup, and acquisition of lab materials and supplies.

During laboratory activity of the laboratory: All of the following criteria are met by this lab.

1. Instructor is physically present in lab when students are performing lab activities.
2. Instructor is responsible for active facilitation of laboratory learning.
3. Instructor is responsible for active delivery of curriculum.
4. Instructor is required for safety and mentoring of lab activities.
5. Instructor is responsible for presentation of significant evaluation.

Post laboratory activity of the laboratory: All of the following criteria are met by this lab.

1. Instructor is responsible for personal evaluation of significant student outcomes (lab exercises, exams, practicals, notebooks, portfolios, etc.) that become a component of the student grade that cover the majority of lab exercises performed during the course.
2. Instructor is responsible for supervision of laboratory clean-up of equipment and materials.

Supplemental Data:

TOP Code:	093400: Electronics and Electric Techn
SAM Priority Code:	C: Clearly Occupational
Distance Education:	Not Applicable
Funding Agency:	Y: Not Applicable(funds not used)
Program Status:	1: Program Applicable
Noncredit Category:	Y: Not Applicable, Credit Course
Special Class Status:	N: Course is not a special class
Basic Skills Status:	N: Course is not a basic skills course

Prior to College Level:	Y: Not applicable
Cooperative Work Experience:	N: Is not part of a cooperative work experience education program
Eligible for Credit by Exam:	NO
Eligible for Pass/No Pass:	C: Pass/No Pass
Taft College General Education:	NONE
Discipline:	Electronics or Electricity or Electrical Engineering

TAFTCOLLEGE

~~Prepared by: K. Olson~~
~~Revised by: J. Carrithers~~
Revised by: T. Davis
Reviewed by: K. Bandy
~~Reviewed by: D. Layne~~
Date prepared: ~~Fall 2016~~
C&GE approved: ~~May 8, 2017~~
Board approved: ~~June 14, 2017~~
Semester effective: ~~Spring 2018~~

Formatted: Strikethrough
Formatted: Strikethrough
Formatted: Strikethrough
Formatted: Strikethrough
Formatted: Strikethrough

Energy (ENER) 1540 Fundamentals of Programmable Logic Controllers (3 Units) CSU

Prerequisite: Successful completion of ENER 1530 with a grade "C" or better

Prerequisite knowledge/skills: Before entering the course the student should be able to:

1. Demonstrate knowledge of the three things required any completed circuit,
2. Demonstrate understanding what is meant by open and closed circuits and short (including "short" and "ground"),
3. Demonstrate understanding of the direction and speed of electron flow in a completed circuit,
4. Demonstrate understanding in how electricity is produced,
5. Demonstrate understanding of how wire size is measured, the different gauges of wire, and their practical applications),
6. Demonstrate understanding why fuses are used to protect circuits, the different types of fuses (homes, industrial machinery, lab devices),
7. Demonstrate understanding of the process of soldering wire and the use of a heat sink,
8. Demonstrate understanding of how a resistor works and what it does,
9. Demonstrate understanding of how a capacitor works and what it does,
10. Demonstrate understanding of the two basic principles of magnetism,
11. Demonstrate understanding of the concept of a P-N junction,
12. Demonstrate the understanding of how a multimeter is used to measure current, voltage and resistance in circuits,
13. Apply circuit and analysis methods for DC and AC circuits with various components using Ohm's Law, Watt's Law, and Kirchoff's Laws, and
14. ~~14.~~ Identify t**he hazards and protections to assure safety at all times when dealing with electricity.**~~Demonstrate proper safety principles~~

Advisory**:** ~~Eligibility for Math 1060 and English 1500 strongly~~

~~recommended~~None Total Hours: 40 hours lecture, 80 Outside of class hours; 32

hours lab (152~~72~~ hours total)

Catalog Description: This course is a comprehensive introduction to the Programmable Logic Controller (PLC), the basic parts of a PLC, how a PLC is used to control a process, the different kinds of PLCs their applications, and troubleshooting. The course covers bit-level input and output instructions, timers, counters, latches, and introduces the ladder logic language developed to simplify the task of programming PLCs. Fieldtrips may be required.

Type of Class/Course: Degree Credit

Text:
Petruzella, Frank D. *ISE Programmable Logic Controllers.* 6th ed., McGraw-Hill, 2022.
~~Petruzella, Frank D. *Programmable Logic Controllers.* 5th ed. New York: McGraw-Hill, 2017.~~ **~~No change recommended~~**

209:AC Control Equipment: TPC Training Systems, Buffalo Grove, Illinois, 2013.

Course Objectives:

By the end of the course a successful student will be able to:

1. Demonstrate understanding of the Allen Bradley PLC programming
2. Explain history and development of the programmable logic controller (PLC)
3. List advantages of the PLC over relay systems
4. Explain the basic sequence of operations of a PLC
5. Explain the components of a PLC and their functions
6. Create basic circuitry and applications for discrete and analog I/O modules
7. Demonstrate understanding of the different types of PLC peripheral support devices available
8. Use decimal, binary, octal, and hexadecimal systems in PLC
9. Explore timer and counter registers and functions
10. Convert relay ladder schematics to ladder logic programs
11. Write program instructions that perform logical operations
12. Demonstrate understanding how to read the input and output image table files and types of data files
13. Identify the function of internal relay instructions
14. Write and enter ladder logic programs
15. Debug, test and verify proper functions of programs

~~Course Scope and Content (Lecture):~~

Course Student Learning Outcomes

1. K – Demonstrate a basic knowledge of the programable logic controllers including functionality and applications. (K-Knowledge)
2. S – Demonstrate programming skills to manipulate programable logic controller for a desired use. (Skill – Psychomotor)
3. A – Demonstrate problem solving skills to determine proper sequence and application for a programable logic controller to a work process. (A- Affective)

Course Scope and Content (Lecture):

TAFTCOLLEGE

Unit I Motor Starters
- A. Manual and Magnetic Starters
- B. Effects of Low Voltage on a Starter
- C. Reverse the Shaft Rotation of a 3-Phase Motor

Unit II Switches and Controls
- A. Industrial Switches and Controls
- B. Commonly used NEMA Pushbutton Stations
- C. Standard and Press-To-Test Indicating Lights
- D. Three-Wire Motor Control Circuits

Unit III Limit Switches
- A. Parts of a Snap-Action Limit Switch
- B. Actuators Used in Limit Switches
- C. Proper Design and Applications of Limit Switch Cams
- D. Mercury Switch Operations

Unit IV Timers and Counters
- A. Reset Timers
- B. Types and Applications of Timers
- C. Control Device for Non-Time Controlled Machine
- D. Registers and Functions of Counters and Timers

Unit V Control Relays
- A. Definition of a Relay
- B. Advantages of a Reed Relay
- C. Double-Break Contacts

Unit VI Motor Control Centers
- A. Define Motor Control Center
- B. Advantages of Back-To-Back MCC Construction
- C. How to Install an MCC

Unit VII Control Panel Wiring
- A. Function of Terminal Blocks
- B. Make a Terminal Connection
- C. Use of Connectors
- D. Use of a Wiring Duct

Unit VIII Programmable Logic Controllers (PLCs), an Overview
- A. Introduction to Programmable Logic Controllers
- B. Parts of the PLC
- C. Principles of Operation
- D. Modifying the Operation
- E. PLCs versus Computers
- F. PLC Size and Application

Unit IX PLC Hardware Components
- A. The I/O Section
- B. Discrete I/O Modules
- C. Analog I/O Modules

D. Special I/O Modules
E. I/O Specifications
F. The Central Processing Unit (CPU)
G. Memory Design
H. Memory Types
I. Programming Terminal Devices
J. Recording and Retrieving Data
K. Human Machine Interfaces (HMIs)

Unit X Number Systems and Codes
A. Decimal System
B. Binary System
C. Negative Numbers
D. Octal System
E. Hexadecimal System
F. Binary Coded Decimal (BCD) System
G. Gray Code
H. ASCII Code
I. Parity Bit
J. Binary Arithmetic

Unit XI Fundamentals of Logic
A. The Binary Concept
B. AND, OR, and NOT Functions
C. Boolean Algebra
D. Developing Logic Gate Circuits from Boolean Expressions
E. Producing the Boolean Equation for a Given Logic Gate Circuit
F. Hardwired Logic versus Programmed Logic
G. Programming Word Level Logic Instructions

Unit XII Basics of PLC Programming
A. Processor Memory Organization
B. Program Scan
C. PLC Programming Languages
D. Relay-Type Instructions
E. Instruction Addressing
F. Branch Instructions
G. Internal Relay Instructions
H. Programming Examine If Closed and Examine If Open Instructions
I. Entering the Ladder Diagram
J. Modes of Operation

Unit XIII Developing Fundamental PLC Wiring Diagrams and Ladder Logic Programs
A. Electromagnetic Control Relays
B. Contactors
C. Motor Starters
D. Manually Operated Switches
E. Mechanically Operated Switches
F. Sensors
G. Output Control Devices
H. Seal-In Circuits

I. Latching Relays
J. Converting Relay Schematics into PLC Ladder Programs
K. Writing a Ladder Logic Program Directly from a Narrative Description

Unit XIV Programming Timers
A. Mechanical Timing Relays
B. Timer Instructions
C. On-Delay Timer Instruction
D. Off-Delay Timer Instruction
E. Retentive Timer
F. Cascading Timers

Unit XV Programming Counters
A. Counter Instructions
B. Up-Counter
C. Down-Counter
D. Cascading Counters
E. Incremental Encoder-Counter Applications
F. Combining Counter and Timer Functions

Unit XVI Program Control Instructions
A. Master Control Reset Instruction
B. Jump Instruction
C. Subroutine Functions
D. Immediate Input and Immediate Output Instructions
E. Forcing External I/O Addresses
F. Safety Circuitry
G. Selectable Timed Interrupt
H. Fault Routine
I. Temporary End Instruction
J. Suspend Instruction

Unit XVII Data Manipulation Instructions
A. Data Manipulation
B. Data Transfer Operations
C. Data Compare Instructions
D. Data Manipulation Programs
E. Numerical Data I/O Interfaces
F. Closed-Loop Control

Unit XVIII Math Instructions
A. Math Instructions
B. Addition Instruction
C. Subtraction Instruction
D. Multiplication Instruction
E. Division Instruction
F. Other Word-Level Math Instructions
G. File Arithmetic Operations

Unit XIX Sequencer and Shift Register Instructions
A. Mechanical Sequencers

B. Sequencer Instructions
C. Sequencer Programs
D. Bit Shift Registers
E. Word Shift Operations

Unit XX PLC Installation Practices, Editing, and Troubleshooting
A. PLC Enclosures
B. Electrical Noise
C. Leaky Inputs and Outputs
D. Grounding
E. Voltage Variations and Surges
F. Program Editing and Commissioning
G. Programming and Monitoring
H. Preventive Maintenance
I. Troubleshooting
J. PLC Programming Software

Unit XXI Process Control, Network Systems, and SCADA
A. Types of Processes
B. Structure of Control Systems
C. On/Off Control
D. PID Control
E. Motion Control
F. Data Communications
G. Supervisory Control and Data Acquisition (SCADA)

Course Scope and Content (Laboratory):

Unit I Design, write, operate three PLC ladder logic programs
A. One input to control one output
B. Two inputs in series to control one output
C. Two inputs in parallel to control one output
D. Download the programs one at a time to the PLC and operate

Unit II Design, write, and operate a motor control PLC ladder logic program
A. 3-wire motor control to include an E-stop, stop, and start with latching control
B. 3-wire motor control with the addition of a jog control

Unit III Design, write, operate a PLC ladder logic program – Two Motors
A. 3-wire motor control with E-stop, start, stop, and jog controls to start motor #1 and then Motor #2 five seconds later (TON delay)
B. 3-wire motor control with E-stop, start, stop, and jog controls to start a pump motor with a ten second delay before a re-start can happen

Unit IV Design, write, and operate a PLC Ladder Logic Program
A. Control- Projector lamp to include a ten second off delay for the cooling fan
B. Control- Traffic intersection, two directions including red, yellow, and green lights
C. Control- Automobile Parking lot, 4 car limit, with vacancy and full lights
D. Control- Production conveyor with box counter and a limit of six boxes per case
E. Control- Fluid, temperature, or pressure control

Unit V Troubleshooting PLC Controls in industrial settings and safety standards

A. Industrial safety practices
B Troubleshooting in in industrial settings (e.g. oil & gas, manufacturing)

Learning Activities Required Outside of Class:

The students in this class will spend a minimum of 6 hours per week outside of the regular class time doing the following:

1. Studying assigned text, handout materials and class notes
2. Reviewing and preparing for quizzes, midterm and final exams
3. Completing group projects

Methods of Instruction:

1. Lecture and discussions
2. Group activities/projects
3. Field trips (industrial sites using PLCs)
4. Lab

Methods of Evaluation:

1. Quizzes
2. Exams
3. Class Participation
4. Individual and group exercises & projects
5. Practical Observation
6. Written reports based on field applications

Laboratory Category: Extensive Laboratory

Pre delivery criteria: All of the following criteria are met by this lab.

1. Curriculum development for each lab.
2. Published schedule of individual laboratory activities.
3. Published laboratory activity objectives.
4. Published methods of evaluation.
5. Supervision of equipment maintenance, laboratory setup, and acquisition of lab materials and supplies.

During laboratory activity of the laboratory: All of the following criteria are met by this lab.

1. Instructor is physically present in lab when students are performing lab activities.
2. Instructor is responsible for active facilitation of laboratory learning.
3. Instructor is responsible for active delivery of curriculum.
4. Instructor is required for safety and mentoring of lab activities.
5. Instructor is responsible for presentation of significant evaluation.

Post laboratory activity of the laboratory: All of the following criteria are met by this lab.

1. Instructor is responsible for personal evaluation of significant student outcomes (lab exercises, exams, practicals, notebooks, portfolios, etc.) that become a component of the student grade that

cover the majority of lab exercises performed during the course.

2. Instructor is responsible for supervision of laboratory clean-up of equipment and materials.

Supplemental Data:

TOP Code:	093400: Electronics and Electric Techn
SAM Priority Code:	C: Clearly Occupational
Distance Education:	Not Applicable
Funding Agency:	Y: Not Applicable(funds not used)
Program Status:	1: Program Applicable
Noncredit Category:	Y: Not Applicable, Credit Course
Special Class Status:	N: Course is not a special class
Basic Skills Status:	N: Course is not a basic skills course
Prior to College Level:	Y: Not applicable
Cooperative Work Experience:	N: Is not part of a cooperative work experience education program
Eligible for Credit by Exam:	E: Credit By Exam
Eligible for Pass/No Pass:	NO
Taft College General Education:	NONE
Discipline:	Electrical Engineering

TAFTCOLLEGE

~~Prepared by: J. Carrithers~~
Prepared by: T. Davis
~~Reviewed by: D. Layne~~
Reviewed by: K. Bandy
Date Revised: Spring ~~2017~~ 2025
C&GE approved: ~~May 8, 2017~~
Board approved: ~~June 14, 2017~~
Semester Effective: ~~Spring 2018~~

Energy (ENER) 1610 Mechanical Systems (3 Units) CSU

Prerequisite: None

Advisory: None

Total Hours: 32 Hours Lecture, 64 Outside of Class Learning Hours; 48 Hours Lab (144~~80~~ hours total)

Catalog Description: This course is a comprehensive study of the mechanical systems, machining, and the essential mechanical processes used to produce, process, and distribute energy. Topics include the operation and selection for application of mechanical drives, mechanical fasteners, shafts, bearings, lubrication systems, hydraulics, pneumatics, materials, tanks and vessels, welding strategy, basic controls schemes, and how to establish a preventative maintenance program. Troubleshooting, problem solving, and ~~decision making~~decision-making tools and skills are presented. Safety, measurement, hand tool operations, and preventative maintenance protocols are examined. Field trips maybe required.

Type of Class/Course: Degree/Credit

Textbook: ~~Kibbe, R. *Mechanical Systems for Industrial Maintenance*, Prentice Hall, 2001.~~

Simionescu, Petru A. *An Introduction to Mechanical System Design*. 1st ed., Texas A&M U Corpus Cristi, 2024.

~~**Simionescu, Petru A., *Introduction to Mechanical System Design*. First Edition 2022**~~

Lab Manuals Online: ~~Donald J. Simenak, Lock Haven University, other university and industrial sites~~

Additional Instructional Materials: none

Course Objectives:
By the end of the course the successful student will be able to:

1. demonstrate proper tool selection, safe operation, maintenance, and troubleshooting techniques to identify and repair mechanical system anomalies and failures,
2. understand different types of mechanical systems; i.e. belts, gears, pulleys, clutches, couplers, etc.,
3. analyze troubleshooting scenarios and identify and apply solutions for mechanical, hydraulic, and pneumatic systems,

Formatted: Strikethrough
Formatted: Strikethrough
Formatted: Strikethrough
Formatted: Font: Bold, Underline
Formatted: Strikethrough
Formatted: Strikethrough
Formatted: Strikethrough
Formatted: Font: (Default) Times New Roman
Formatted: Font: Bold

4. demonstrate the accurate use of measurement devices for determining mechanical requirements and performance of mechanical systems such as micrometers, rulers, calipers, and pressure gauges,
5. calculate specifications, select, and justify the needed horsepower, RPM, and torque for mechanical drives, chain - gear, gear-gear, and belt-pulley systems, and pumps and motors, with emphasis on mechanical systems used for energy production, distribution, and processing,
6~~4~~. identify and select appropriate bearings, bushings, seals, gaskets, diaphragms o-rings, pressure packing materials, and the appropriate lubrication type and application for each,
7~~5~~. demonstrate the ability to perform preventative maintenance planning, repair, and re-installation tasks on regulators, pumping units, packing glands, chain drives, and motor valves,
8~~6~~. identify and select the appropriate mechanical fasteners and welding, brazing, or soldering techniques for various mechanical joining applications,
9~~7~~. demonstrate ability to read and interpret drawings of mechanical systems,
10~~8~~. locate and research technical information,
11~~9~~. locate and order spare or replacement parts, and
12~~10~~. maintain a preventative maintenance schedule including equipment history.

Course Student Learning Outcomes

1. K – Demonstrate an understand of how all of the parts in a mechanical system work together to for its intended use (K-Knowledge).
2. S – Skills are used to identify the proper tool or measuring device needed to service or repair a mechanical system (Skill- Psychomotor).
3. A – Demonstrate trouble shooting and problem-solving skills to understand how mechanical systems are connected using fasteners including welding, brazing, soldering, bolts, pins and clamps. (A- Affective)

Course Scope and Content (Lecture):

Unit I Basic Principles of Mechanical Systems
- A. History of Mechanical Systems
- B. Getting Power: Water, Wind, Engines, and Motors
- C. Mechanical Systems Fundamentals
- D. Mechanical System Applications
- E. Mechanical Systems in Energy Production

Unit II Hand Tools and Power Tools
- A. History of Hand Tools
- B. Common Hand Tools: Their Application and Safe Use
- C. Drilling Devices, Twist Drills, Punch Presses
- D. Hand Grinders and Bench Grinders
- E. Abrasives
- F. Saws and Shears
- G. Hydraulic Jacks and Presses
- H. Pneumatic Tools

Unit III Measurement and Measuring Tools

A. History of Measurement
B. Measurement Tools and Uses in Dimensional, Mechanical, Hydraulic, Pneumatic system measurement and performance
C. Measurement Systems including fractions, decimals, metric and conversions between each
D. Dimensional Measuring Tools: Rules, Calipers, Micrometers, Depth Gauge, etc.
E. Measuring Mechanical Performance
F. Measuring Pneumatic and Hydraulic System Performance

Unit IV Mechanical Hardware and Joinery
A. History of Joinery in Mechanical Devices
B. Overview of Types of Mechanical Fasteners – Screws, Bolts/Nuts, Rivets, Set Screws, Keys and Keyways, Cam Lock, Latches, Detents, Hinges, etc.
C. Screw and Bolt Thread Types and Applications
D. Adhesive Applications in Mechanical Systems
E. Overview of Welding, Brazing, Soldering Applications
F. Inspection and Preventative Maintenance for Mechanical Fasteners
G. Inspection and Preventative Maintenance of Welded Components

Unit V Machining and Machine Tool Operations
A. History of Machine Tools
B. Types of Machine Tools Available
C. Machining Processes and Applications
D. Numerical Control of Machining
E. Reading Mechanical Blueprints
F. Operating Machine Tools Safely and Effectively
G. Reading Mechanical Blueprints

Unit VI Working on Machinery and Mechanical Systems
A. Risk Reduction and Mitigation – Engineering Controls, Guards, and Interlock Devices
B. Role of Preventative Maintenance Programs: Why, What, How, Who, When, Where
C. Types of Mechanical Failures and Operating Anomalies
D. Mechanical Troubleshooting Processes
E. Preventative Maintenance Tasks including Lockout/Tag out
F. Repair and/or Replacement Tasks including Lockout/Tag out

Unit VII Bushing and Bearings: Handling a Load Reliably
A. History of Bearing and Bushing Applications
B. Sleeve Bearings – Metallurgy, Application, Lubrication, and Maintenance
C. Sleeve Bushing – Metallurgy, Application, Lubrication, and Maintenance
D. Ball Bearings – Metallurgy, Application, Lubrication, and Maintenance
E. Roller Bearings – Metallurgy, Application, Lubrication, and Maintenance
F. Shaft Couplings – Types, Application, Selection

Unit VIII Pipe, Tubing, Hose
A. Historical Applications of Piping, Tubing and Hose
B. Safely Moving Air, Water, Chemicals, Steam, Gas, and Petroleum
C. Bernoulli's Equation
D. Principles of Pressure, Temperature, Hydrostatics, Corrosion, Hydraulics, and Steam Dynamics

E. Pipe Sizing and Selection Resources, including well and drilling tubulars
F. Calculating Specifications and Sizing Air Piping, Tubing, and Hose
G. Calculating Specifications and Sizing Water Piping, Tubing, and Hose
H. Calculating Specifications and Sizing Chemical Piping Tubing and Hose
I. Calculating Specifications and Sizing Steam Pipe and Tubing
J. Calculating Specifications and Sizing Gas Pipe and Tubing
K. Calculating Specifications and Sizing Petroleum Pipe and Tubing
L. Calculating Specifications and Sizing Drill Pipe and Tubing
M. Corrosion Prevention and Control in Piping, Tubing, and Hoses

Unit IX Valves, Regulators, Measurement, End Devices and Controls
A. History of Valves and Controls
B. Valves: Types and Applications
C. Pressure Regulators: Types and Applications
D. Measurement Devices used in energy production and processing
E. End Devices: Types and Application
F. Process Logic Control basics

Unit X Tanks, Pressure Vessels and Water Treatment
A. History of vessels and tanks
B. Hydraulic head calculations- tank level, pressure, specific gravity relationship
C. Types of Tanks and Applications
D. Tank Selection Resources
E. Tank Regulatory Requirements and Compliance
F. Tank Design, Construction, and Operations
G. Types of Pressure Vessels and Applications
H. Pressure Vessel Coding, Certification, and Construction
I. Pressure Vessel Operations and Regulatory Compliance
J. Pressure Vessel Inspections and Testing – Hydrostatic Testing
K. Pressure Vessel Selection Resources
L. Water Treatment – Vessels, Tanks, and Treatment Processes

Unit XI Hydraulics and Fluid Power
A. History of Hydraulic Systems
B. Bernoulli's Equation in Hydraulic Systems
C. Hydraulic System Components – pumps, accumulators, filters, cylinders, pistons, etc.
D. Hydraulic Power System Operations
E. Hydraulic Power System Preventative Maintenance
F. Hydraulic Power System Anomalies and Failures
G. Hydraulic Power System Troubleshooting
H. Hydraulic Power System Repair and Replacement

Unit XII Pneumatic Systems
A. History of Pneumatics
B. Bernoulli's Equation in Pneumatic Systems
C. Pneumatic system components – pumps, accumulators, filters, cylinders, pistons, etc.
D. Pneumatic Power System Operations
E. Pneumatic Power System Preventative Maintenance

F. Pneumatic Power System Anomalies and Failures
G. Pneumatic Power System Troubleshooting
H. Pneumatic Power System Repair and Replacement
I. Advanced Pneumatic Components and Circuits

Unit XIII Lubricants and Lubrication Systems
A. Functions and History of Lubricants
B. Types of Lubricants used in mechanical systems
C. Lubricant Weights and Ratings
D. Specific Gravity and API Gravity Calculations and Measurement
E. Lubricant Testing and Analysis
F. Selecting Lubricants – Mineral vs. Synthetics
G. Lubricant Application in Mechanical Systems
H. Lubricant and Engine Oil Filtering Applications
I. Pumped Distribution Lubricant Systems – Maintenance, Troubleshooting, Repair
J. Lubrication and Drilling Fluids

Unit XIV Properties and Strength of Materials
A. History of Materials and their Properties
B. Atomic Structure and the Periodic Chart overview
C. Basic Engineering: Vectoring, Shear, Section Modulus, Modulus of Elasticity, Moment Arm
D. Metals used in Mechanical System Construction and Operations, including well drilling
E. Specialty Metals- springs, valve plates, valve components, steam fittings, corrosive service
F. Polymers- power belts, seals, packings, gaskets, o-rings, and ropes
G. Ceramics- electrical insulation, heat control, instruments, and hi-tech fibers
H. Composite materials- housings, measurement, wind turbines, and solar panels
I. Concrete- applications, quality, slump testing, forming, pouring, troweling, and curing

Unit XV Welding, Brazing, Soldering, and Cutting
A. History of Metalworking
B. Selecting the right metal joining technology
C. Soldering Applications- process, safety, and practice
D. Brazing and Hard Facing- applications, process, and safety
E. Stick Welding- applications, process, and safety
F. Wire Feed Welding- applications, process, and safety
G. Flame Cutting- applications, process, and safety
H. Carbon Arc- applications, process, and safety

Unit XVI Related Skills for Operating and Maintenance Technicians
A. Operating and Maintenance Philosophies
B. Reading Engineering Drawings
C. Locating Technical Information
D. Identifying, finding, and ordering spare parts
E. Preventative Maintenance Programs
F. Maintaining equipment operating history
G. Regulatory Permit Compliance- IC engines, steam generators, tanks, and vessels
H. Minimizing the environmental footprint of machinery
I. Optimizing Machinery Performance

J. Avoiding and Preventing Major Failures
K. Clean-up Operations
L. Incident Investigation and Follow-up
M. Root Cause Failure Analysis
N. Continuous Improvement following an incident

Course Scope and Content (Laboratory):

Unit I Basic Tools and Measurements
A. Introduction to Lab Safety
B. Demonstrate safe tool handling with various hand tools
C. Use various systems and tools for measuring
D. Reading blueprints and mechanical blueprints

Unit II Basic Hydraulics
A. Examine typical components in hydraulic systems
B. Construct basic hydraulic systems
C. Explore basic circuits to control basic hydraulic systems
D. Troubleshoot typical problems occurring in hydraulic systems

Unit III Basic Pneumatics
A. Examine pneumatic components
B. Construct pneumatic systems
C. Explore basic circuits to control basic pneumatic systems
D. Troubleshoot typical problems occurring in basic systems

Unit IV Advanced Pneumatics
A. Design and create advanced pneumatic systems
B. Design and create circuits to control advanced pneumatic systems
C. Troubleshoot problems in advanced pneumatic systems

Unit V Materials and Applications
A. Examine specialty metals: springs, valves, steam fittings, corrosive service
B. Examine polymers: power belts, seals, packings, gaskets, o-rings, ropes
C. Examine ceramics: electrical insulation, heat control, instruments, hi-tech fibers
D. Examine composite materials: housings, wind turbines, and solar panels
E. Examine tanks and vessels
F. Cutting, bending, and shaping materials for specific field applications

Unit VI Specialty Systems
A. Align motor and shaft assemblies
B. Develop systems to reduce and control vibrations
C. Perform hydrostatic tests on various systems

Learning Activities Required Outside of Class:

The students in this class will spend a minimum of 4 hours per week outside regular class time doing the following:
1. Studying class notes
2. Answering questions
3. Completing required reading

4. Performing problem solving activities or exercises
5. Doing written work
6. Visiting locations relevant to the course content

Methods of Instruction:

1. Case Studies and Scenarios
2. Demonstrations
3. Discussion
4. Laboratory
5. Lecture
6. Troubleshooting
7. Problem Solving
8. Research and Reporting
9. Multi-media Presentations
10. Field Trips

Methods of Evaluation:

1. Writing assignments, including
   a. reports
   b. topic paper written under American Psychological Association (APA) style guide
   c. chapter critical analysis reflections
   d. case studies
   e. scenarios
   f. simulations

2. Problem-solving demonstrations, including:
   a. exams
   b. homework problems
   c. troubleshooting
   d. scenarios
   e. case study recommendations and solutions

3. Other summative examinations using combinations of:
   a. multiple choice questions
   b. matching items
   c. true/false questions
   d. short answer questions
   e. fill in the blank responses

4. Participation including:
   a. group activities
   b. oral presentations and demonstrations
   c. discussion responses
   d. scenario reflections

5. Projects including:
   a. multimedia presentations
   b. scenario responses
   c. action plans
   d. formal written reports

e. building new case studies

Laboratory Category: Extensive Laboratory

Pre delivery criteria: All of the following criteria are met by this lab.

1. Curriculum development for each lab.
2. Published schedule of individual laboratory activities.
3. Published laboratory activity objectives.
4. Published methods of evaluation.
5. Supervision of equipment maintenance, laboratory setup, and acquisition of lab materials and supplies.

During laboratory activity of the laboratory: All of the following criteria are met by this lab.

1. Instructor is physically present in lab when students are performing lab activities.
2. Instructor is responsible for active facilitation of laboratory learning.
3. Instructor is responsible for active delivery of curriculum.
4. Instructor is required for safety and mentoring of lab activities.
5. Instructor is responsible for presentation of significant evaluation.

Post laboratory activity of the laboratory: All of the following criteria are met by this lab.

1. Instructor is responsible for personal evaluation of significant student outcomes (lab exercises, exams, practicals, notebooks, portfolios, etc.) that become a component of the student grade that cover the majority of lab exercises performed during the course.
2. Instructor is responsible for supervision of laboratory clean-up of equipment and materials.

Supplemental Data:

T.O.P. Code:	0935.00 Electro-Mechanical Tech
Sam Priority Code:	C: Clearly Occupational
Funding Agency:	Y: Not Applicable
Program Status:	1: Program Applicable

TAFTCOLLEGE

Noncredit Category:	Y: Not Applicable, Credit Course
Special Class Status:	N: Course is not a special class
Basic Skills Status:	N: Course is not a basic skills course
Prior to College Level:	Y: Not Applicable
Cooperative Work Experience:	N: is not part of a cooperative work experience education program
Eligible for Credit by Exam:	No
Eligible for Pass/No Pass:	Yes
Discipline:	Mechanical Engineering or Electro-Mechanical Tech. or Mining and Metallurgy (Oil Field Operations)

TAFTCOLLEGE

Course Development Memo

To:	Greg Bormann, Chief Instructional Officer Dr. Vicki Jacobi, Curriculum Co-Chair
From:	Kanoe Bandy
Division:	Applied Technologies
Date:	4/9/2025
Re:	ENERGY COR Updates (ENER 1025, 1513, 1515, 1520, 1530, 1540, 1610, 1620, 1630, 2900)

Type of Curriculum Change:

☐ New Course*
☐ Substantial Course Change*
☐ Nonsubstantial Course Change*
☐ Course Inactivation

For Course Changes, why is this course being updated?

☐ For C-ID

☒ As part of the 5 year review cycle

☐ Other (please explain):_____

Courses need review for SLOs and DLE applications before coming to Tech Review. CSLO and GELO need to be included in the Course Outline of Record.

Date COR went to SLO Committee _____

Date COR went to Distance Learning Education Committee _____

For New Courses, please enter a justification for the request:

Please enter a brief description of the background and rationale for the course. This might include a description of a degree or certificate for which the course is required or the relationship of this course to other courses in the same or other disciplines:

Click here to enter text.

Programs Affected/Stand Alone:

Please list all degrees and certificates affected. The division will need to submit the degrees where the CORs is part of the degree.

*SLOs are required

Energy Tech degree and certificates

☐ **Addition to Taft College General Education:**

☐ Natural Science ☐ Social & Behavioral Science ☐ English Composition

☐ Humanities ☐ Communication & Critical Thinking

Justification for Addition to Taft College General Education:

Please list the General Education SLOs this course meets:

Click here to enter text.

*SLOs are required

TAFTCOLLEGE

Taft College Distance Learning Approval Form

Addendum to the Course Outline of Record

Course #: ENER 1503

Course Title: Environmental Awareness and Regulatory Compliance

Submitted by: Terry Davis

Date: 04/01/2025

Please electronically submit this form, along with the COR and C-ID if available, as a Word file to the Director of Distance Education.

1. Has this course previously been approved for distance learning?

   ☐ Yes, course is already approved for distance learning and this form is being updated as part of the course review cycle.

   ☒ No

   ☐ Other (please explain):

2. This course is being approved for online, offline, and hybrid delivery. If you feel one or more of those deliveries is not appropriate for this course, please select and explain below:

   ☐ Course is appropriate for all three methods of delivery (no explanation needed).

   ☐ Course is not appropriate for online delivery:

   ☒ Course is not appropriate for offline delivery:

   ☐ Course is not appropriate for hybrid delivery:

3. If this course is approved to be offered in a Distance Learning format, will this action push the percentage of Distance Learning courses offered in the program over 50%? If you are not sure, view the **IR Accreditation page for Substantive Change** or ask the division chair and/or the DE Director to determine.

   ☐ Prior to this submission, the percentage of Distance Learning courses offered in the program was already over 50%

   ☒ This course will NOT push the percentage of Distance Learning courses offered in the program over 50%

   ☐ This course will push the percentage of Distance Learning courses offered in the program over 50% and a Substantive Change has been submitted to ACCJC.

4. All course outcomes identified in the Course Outline of Record must be met in the distance learning environment. Identify any unique challenges related to outcomes in this course specific to the distance education environment. For those identified, explain how they may be met in a distance learning environment.

   ☒ Beyond maintaining regular and effective contact and adhering to accessibility requirements, this course does not present any unique challenges to meeting all course outcomes (no explanation needed).

Potential challenges to meeting course outcomes:

☐ Educational materials
☐ Labs
☐ Models
☐ Presentations
☐ Requirements to present in front of live audience
☐ Field trips
☐ Requirements to attend a live performance
☐ Other:

Explain how each identified challenge can be met in a distance learning environment:

5. In accordance with Title 5 and AP 5145 instruction provided as distance education is subject to the requirements that may be imposed by the Americans with Disabilities Act (42 U.S.C. § 12100 et seq.) and section 508 of the Rehabilitation Act of 1973, as amended (29 U.S.C. § 794d).

   ☒ I/We have read the full text of Title 5 Section 55206, AP 5145 and the requirements listed below. To ensure access to education for all students, I/We agree that the course content will be designed and maintained to ensure that it is ADA and 508 compliant.

   ADA and 508 Compliance Requirements:
   a. Videos are accurately captioned.
   b. Audio files are transcribed.
   c. Objects (including images, tables, and charts) have alternative text.
   d. Course materials are "readable" in terms of font, color contrast, and spacing. Color is not the only method used to convey meaning.
   e. Hyperlink text is meaningful.
   f. Documents are created in such a way that screen reading software can "read" them. (i.e. styles are used; column header rows in tables are specified, etc.)

6. In accordance with Title 5 and AP 4105 this course must promote regular effective instructor/student contact.

   ☒ I/We have read the full text of Title 5 Section 55204 Instructor Contact, AP 4105, and the guidelines listed below. Having thoughtfully considered the educational value of offering this course in the distance education environment, I/We agree that this course will consistently promote regular effective instructor/student contact.

   Regular Effective Contact Guidelines: DE courses are considered the "virtual equivalent" to in-person courses. Lack of regular, timely, and effective contact between students and instructors is a major factor in student attrition and poor performance in online courses. Therefore, an instructor shall regularly initiate interaction with students to determine that they are accessing and comprehending course material and that they are participating regularly in the activities in the course.

   Recommended:

   I. Syllabus includes a communication policy that explains or states the following:
      a. the frequency of all contact initiated by the instructor.
      b. the timeliness of response to student-initiated contact.
      c. the course policy regarding student-initiated contact (where to post questions, assignments, etc.)
      d. important dates, such as assignment and assessment deadlines.

e. Instructor contact information which includes virtual or in-person office hours.
f. The student-to-student contact requirements for the course.

Required:

II. Regular effective contact will be maintained over the course of a week and should occur as often as is appropriate for the course. A response time of 24-48 hours, Monday through Friday is desirable but may vary based on course requirements and extenuating circumstances.

III. Frequent and substantive feedback is provided throughout the course. A statement describing the frequency and timeliness of instructor feedback will be posted in the syllabus and/or other course documents that are made available for students when the course officially opens each semester.

IV. Regarding the type of contact that will exist in all Taft College distance learning courses, instructors will use three or more of the following methods to maintain contact with students outlined in AP 4105:

a. Orientation materials	g. Face-to-face formal meetings	m. Personalized feedback for student work
b. Weekly announcements in the CMS	h. Feedback for student work	n. Voicemail and telephone
c. Threaded discussion boards	i. Podcasts	o. Interactive mobile technologies
d. Email contact (within or outside the CMS)	j. Instructor-prepared e-lectures or publisher-created e-lectures or materials	p. Videoconferencing
e. Participation in online group collaboration projects	k. Virtual Office hours	q. Live orientation or review sessions
f. Face-to-face informal meetings	l. Screencasts	r. Others as appropriate

DE Committee Comments:

Course DE request approved with modification to response to question two as requested by department chair.

Date forwarded to the Curriculum Committee: 04/29/2025 (JL)

Curriculum Committee Comments:

Course Approved or Disapproved

TAFTCOLLEGE

Taft College Distance Learning Approval Form

Addendum to the Course Outline of Record

Course #: ENER 1510

Course Title: Introduction to Energy

Submitted by: Terry Davis

Date: 04/01/2025

Please electronically submit this form, along with the COR and C-ID if available, as a Word file to the Director of Distance Education.

1. Has this course previously been approved for distance learning?

   ☐ Yes, course is already approved for distance learning and this form is being updated as part of the course review cycle.

   ☒ No

   ☐ Other (please explain):

2. This course is being approved for online, offline, and hybrid delivery. If you feel one or more of those deliveries is not appropriate for this course, please select and explain below:

   ☐ Course is appropriate for all three methods of delivery (no explanation needed).

   ☐ Course is not appropriate for online delivery:

   ☒ Course is not appropriate for offline delivery:

   ☐ Course is not appropriate for hybrid delivery:

3. If this course is approved to be offered in a Distance Learning format, will this action push the percentage of Distance Learning courses offered in the program over 50%? If you are not sure, view the **IR Accreditation page for Substantive Change** or ask the division chair and/or the DE Director to determine.

   ☐ Prior to this submission, the percentage of Distance Learning courses offered in the program was already over 50%

   ☒ This course will NOT push the percentage of Distance Learning courses offered in the program over 50%

   ☐ This course will push the percentage of Distance Learning courses offered in the program over 50% and a Substantive Change has been submitted to ACCJC.

4. All course outcomes identified in the Course Outline of Record must be met in the distance learning environment. Identify any unique challenges related to outcomes in this course specific to the distance education environment. For those identified, explain how they may be met in a distance learning environment.

   ☒ Beyond maintaining regular and effective contact and adhering to accessibility requirements, this course does not present any unique challenges to meeting all course outcomes (no explanation needed).

Potential challenges to meeting course outcomes:

- ☐ Educational materials
- ☐ Labs
- ☐ Models
- ☐ Presentations
- ☐ Requirements to present in front of live audience
- ☐ Field trips
- ☐ Requirements to attend a live performance
- ☐ Other:

Explain how each identified challenge can be met in a distance learning environment:

5. In accordance with Title 5 and AP 5145 instruction provided as distance education is subject to the requirements that may be imposed by the Americans with Disabilities Act (42 U.S.C. § 12100 et seq.) and section 508 of the Rehabilitation Act of 1973, as amended (29 U.S.C. § 794d).

   ☒ I/We have read the full text of Title 5 Section 55206, AP 5145 and the requirements listed below. To ensure access to education for all students, I/We agree that the course content will be designed and maintained to ensure that it is ADA and 508 compliant.

   ADA and 508 Compliance Requirements:
   a. Videos are accurately captioned.
   b. Audio files are transcribed.
   c. Objects (including images, tables, and charts) have alternative text.
   d. Course materials are "readable" in terms of font, color contrast, and spacing. Color is not the only method used to convey meaning.
   e. Hyperlink text is meaningful.
   f. Documents are created in such a way that screen reading software can "read" them. (i.e. styles are used; column header rows in tables are specified, etc.)

6. In accordance with Title 5 and AP 4105 this course must promote regular effective instructor/student contact.

   ☒ I/We have read the full text of Title 5 Section 55204 Instructor Contact, AP 4105, and the guidelines listed below. Having thoughtfully considered the educational value of offering this course in the distance education environment, I/We agree that this course will consistently promote regular effective instructor/student contact.

   Regular Effective Contact Guidelines: DE courses are considered the "virtual equivalent" to in-person courses. Lack of regular, timely, and effective contact between students and instructors is a major factor in student attrition and poor performance in online courses. Therefore, an instructor shall regularly initiate interaction with students to determine that they are accessing and comprehending course material and that they are participating regularly in the activities in the course.

   Recommended:

   I. Syllabus includes a communication policy that explains or states the following:
      a. the frequency of all contact initiated by the instructor.
      b. the timeliness of response to student-initiated contact.
      c. the course policy regarding student-initiated contact (where to post questions, assignments, etc.)
      d. important dates, such as assignment and assessment deadlines.

e. Instructor contact information which includes virtual or in-person office hours.
f. The student-to-student contact requirements for the course.

Required:

II. Regular effective contact will be maintained over the course of a week and should occur as often as is appropriate for the course. A response time of 24-48 hours, Monday through Friday is desirable but may vary based on course requirements and extenuating circumstances.

III. Frequent and substantive feedback is provided throughout the course. A statement describing the frequency and timeliness of instructor feedback will be posted in the syllabus and/or other course documents that are made available for students when the course officially opens each semester.

IV. Regarding the type of contact that will exist in all Taft College distance learning courses, instructors will use three or more of the following methods to maintain contact with students outlined in AP 4105:

a. Orientation materials	g. Face-to-face formal meetings	m. Personalized feedback for student work
b. Weekly announcements in the CMS	h. Feedback for student work	n. Voicemail and telephone
c. Threaded discussion boards	i. Podcasts	o. Interactive mobile technologies
d. Email contact (within or outside the CMS)	j. Instructor-prepared e-lectures or publisher-created e-lectures or materials	p. Videoconferencing
e. Participation in online group collaboration projects	k. Virtual Office hours	q. Live orientation or review sessions
f. Face-to-face informal meetings	l. Screencasts	r. Others as appropriate

DE Committee Comments:

Course DE request approved with modification to response to question two as requested by department chair.

Date forwarded to the Curriculum Committee: 04/29/2025 (JL)

Curriculum Committee Comments:

Course Approved or Disapproved

CRN	Subject	Course	Section	Course Title	Instructor	Division
52406	ADMJ	1501	40	Introduction to Criminal Justice	Raber, T.	SOC
55435	ADMJ	1501	41	Introduction to Criminal Justice	Raber, T.	SOC
52414	ADMJ	1501	70	Introduction to Criminal Justice	Raber, T.	SOC
52408	ADMJ	1502	40	Concepts of Criminal Law	Raber, T.	SOC
53013	ADMJ	1503	40	Criminal Court Process	Raber, T.	SOC
53014	ADMJ	1508	70	Introduction to Corrections	Raber, T.	SOC
55422	ART	1500	20	Art Appreciation	Rodenhauser, D.	BA&H
55423	ART	1500	40	Art Appreciation	Rodenhauser, D.	BA&H
55424	ART	1500	41	Art Appreciation	Reed, N.	BA&H
55425	ART	1500	42	Art Appreciation	Rodenhauser, D.	BA&H
55600	ART	1500	44	Art Appreciation	Rodenhauser, D.	BA&H
55438	ART	1500	70	Art Appreciation	Rodenhauser, D.	BA&H
55536	ART	1600	41	Two-Dimensional Design	Rodenhauser, D.	BA&H
55207	ART	1600	70	Two-Dimensional Design	Rodenhauser, D.	BA&H
50075	ART	1620	40	Drawing and Composition	Rodenhauser, D.	BA&H
52010	ART	1620	70	Drawing and Composition	Rodenhauser, D.	BA&H
52998	ART	1625	40	Color Theory	Reed, N.	BA&H
55209	ART	1625	70	Color Theory	Reed, N.	BA&H
54044	ART	1640	40	Painting	Reed, N.	BA&H
52423	ART	1800	40	Introduction to Digital Art	Dimayuga, A.	BA&H
52422	ART	1811	40	Graphic Design	Dimayuga, A.	BA&H
52726	ECEF	1531	40	The Child in Family/Community Relationships	Beasley, M.	SOC
52009	ECEF	1531	70	The Child in Family/Community Relationships	Beasley, M.	SOC
50838	ECEF	1571	70	Child Study and Assessment	Roth, R.	SOC
52007	ECEF	1590	40	Health, Safety, and Nutrition	Beasley, M.	SOC
50837	ECEF	1601	40	Diversity in Early Care, Education and Family Studie	Roth, R.	SOC
50227	ECON	2120	40	Principles of Economics - Micro	Bledsoe, A.	BA&H
55426	ECON	2120	41	Principles of Economics - Micro	Bledsoe, A.	BA&H
50218	ECON	2210	20	Principles of Economics - Macro	Bledsoe, A.	BA&H
50052	ECON	2210	40	Principles of Economics - Macro	Bledsoe, A.	BA&H
55427	ECON	2210	41	Principles of Economics - Macro	Bledsoe, A.	BA&H
55546	ENGL	C1000	43	Academic Reading and Writing	Dyer, G.	ENGL
50032	ENGL	C1000	70	Academic Reading and Writing	Chung-Wee, C.	ENGL
55436	ENGL	C1000E	20	Academic Reading and Writing	Dyer, G.	ENGL
55421	ENGL	C1000E	40	Academic Reading and Writing	Dyer, G.	ENGL
56034	ENGL	C1000E	41	Academic Reading and Writing	Dyer, G.	ENGL
52773	ENGL	1600	43	Critical Thinking, Literature, and Composition	Chung-Wee, C.	ENGL
54550	ENGL	1600	44	Critical Thinking, Literature, and Composition	Chung-Wee, C.	ENGL
54036	ENGL	1600	45	Critical Thinking, Literature, and Composition	Dyer, G.	ENGL
50033	ENGL	1600	70	Critical Thinking, Literature, and Composition	Chung-Wee, C.	ENGL
55195	GEOG	1520	40	World Regional Geography	Altenhofel, J.	SOC
50855	HIST	2202	20	Western Civilization to 1600	Smith, K.	SOC
50248	HIST	2210	40	World Civilization to 1500	Smith, K.	SOC
52003	HIST	2231	22	History of the United States to 1877	Mendoza, T.	SOC
52437	HIST	2231	23	History of the United States to 1877	Altenhofel, J.	SOC
55513	HIST	2231	25	History of the United States to 1877	Gonzalez, O.	SOC
52766	HIST	2231	40	History of the United States to 1877	Smith, K.	SOC
50171	HIST	2231	41	History of the United States to 1877	Altenhofel, J.	SOC
50369	HIST	2231	42	History of the United States to 1877	Smith, K.	SOC

CRN	Subject	Course	Section	Course Title	Instructor	Division
53538	HIST	2231	43	History of the United States to 1877	Altenhofel, J.	SOC
50004	HIST	2231	71	History of the United States to 1877	Smith, K.	SOC
50019	HIST	2232	21	History of the United States Since 1877	Altenhofel, J.	SOC
50176	HIST	2232	22	History of the United States Since 1877	Altenhofel, J.	SOC
51685	HIST	2232	41	History of the United States Since 1877	Altenhofel, J.	SOC
52449	HIST	2232	42	History of the United States Since 1877	Altenhofel, J.	SOC
50175	HIST	2232	70	History of the United States Since 1877	Smith, K.	SOC
52002	HIST	2232	71	History of the United States Since 1877	Smith, K.	SOC
55412	LIBR	1548	20	Introduction to Library Research	Smith, T.	LRN
55414	LIBR	1548	40	Introduction to Library Research	Taibjee, S.	LRN
56018	POLS	C1000	20	American Government and Politics	Nishiyama, W.	SOC
56019	POLS	C1000	21	American Government and Politics	Nishiyama, W.	SOC
56020	POLS	C1000	22	American Government and Politics	Nishiyama, W.	SOC
56021	POLS	C1000	23	American Government and Politics	Nishiyama, W.	SOC
56022	POLS	C1000	24	American Government and Politics	Nishiyama, W.	SOC
56023	POLS	C1000	40	American Government and Politics	Nishiyama, W.	SOC
56024	POLS	C1000	41	American Government and Politics	Nishiyama, W.	SOC
56027	POLS	C1000	42	American Government and Politics	Combs, N.	SOC
56028	POLS	C1000	43	American Government and Politics	Nishiyama, W.	SOC
56035	POLS	C1000	44	American Government and Politics	Villa, W.	SOC
50117	PSYC	C1000	21	Introduction to Psychology	Raber, T.	SOC
55211	PSYC	C1000	24	Introduction to Psychology	Medina, C.	SOC
50886	PSYC	2200	20	Elementary Statistics for the Behavioral and Social	Medina, C.	SOC
52061	PSYC	2200	22	Elementary Statistics for the Behavioral and Social	Oja, M.	SOC
52443	PSYC	2200	23	Elementary Statistics for the Behavioral and Social	Oja, M.	SOC
50315	PSYC	2200	40	Elementary Statistics for the Behavioral and Social	Rangel-Escobedo, J.	SOC
55212	PSYC	2200	41	Elementary Statistics for the Behavioral and Social	Rangel-Escobedo, J.	SOC
52778	PSYC	2200	70	Elementary Statistics for the Behavioral and Social	Rangel-Escobedo, J.	SOC
52005	PSYC	2205	20	Introduction to Research Methods in the Social Scie	Oja, M.	SOC
50402	SOC	1510	20	Introduction to Sociology	Jimenez Murguia, S.	SOC
50135	SOC	1510	21	Introduction to Sociology	Jimenez Murguia, S.	SOC
50140	SOC	1510	40	Introduction to Sociology	Jimenez Murguia, S.	SOC
50399	SOC	1510	41	Introduction to Sociology	Jimenez Murguia, S.	SOC
54068	SOC	1510	42	Introduction to Sociology	Jimenez Murguia, S.	SOC
52451	SOC	1510	70	Introduction to Sociology	Jimenez Murguia, S.	SOC
50314	SOC	2120	40	American Social Problems	Jimenez Murguia, S.	SOC
55514	SPAN	1601	21	Elementary Spanish I	Montelongo, M.	BA&H
55785	SPAN	1601	22	Elementary Spanish I	Montelongo, M.	BA&H
50322	STAT	C1000	40	Introduction to Statistics	Mitchell, D.	SCI
53002	STAT	C1000	41	Introduction to Statistics	Cahoon, N.	SCI
55456	STAT	C1000	43	Introduction to Statistics	Mitchell, D.	SCI
55564	STAT	C1000	44	Introduction to Statistics	Cahoon, N.	SCI
50006	STAT	C1000	70	Introduction to Statistics	Cahoon, N.	SCI
50212	STAT	C1000	71	Introduction to Statistics	Mitchell, D.	SCI
52417	STAT	C1000	72	Introduction to Statistics	Cahoon, N.	SCI
55990	STAT	C1000	73	Introduction to Statistics	Cahoon, M.	SCI
54054	STSU	1500	40	Strategies for College and Life Management	Chaidez, J.	LRN
54055	STSU	1500	41	Strategies for College and Life Management	Chaidez, J.	LRN
54545	STSU	1500	42	Strategies for College and Life Management	Chaidez, J.	LRN

CRN	Subject	Course	Section	Course Title	Instructor	Division
54053	STSU	1500	70	Strategies for College and Life Management	Chaidez, J.	LRN

Phase II A - FALL 2026

C&GE by	Board by	Catalog	Schedule
Oct. 2025	Nov. 2025	May 2026	Feb. 2026

ARTH C1100	ARTH 1510
ARTH C1200	ARTH 1520
ECON C2001	ECON 2120
ECON C2002	ECON 2210
ENGL C1002	ENGL 1650
ENGL C1003	ENGL 1600
HIST C1001	HIST 2231
HIST C1002	HIST 2232

Phase II B - FALL 2027

C&GE by	Board by	Catalog	Schedule
April. 2026	May 2026	May 2027	Feb. 2027

ASTR C1000	ASTR 1511
BIOL C1000	BIOL 1510
BIOL C1001	BIOL 1500
CDEV C1000	PSYC 2003
COMM C1004	COMM 1530
MATH C2210	
MATH C2211	MATH 2100
MATH C2220	
MATH C2221	MATH 2120
SOCI C1000	SOC 1510

Phase III - FALL 2027

C&GE by	Board by	Catalog	Schedule
April. 2026	May 2026	May 2027	Feb. 2027

TAFTCOLLEGE

Curriculum and General Education Committee Charter

Mission of Taft College

Taft College is committed to creating a community of learners by enriching the lives of all students we serve through Career Technical Education, transfer programs, foundational programs, and student support services. Taft College provides an equitable learning environment defined by applied knowledge leading to students' achievement of their educational goals.

In supporting the mission of Taft College, the Curriculum and General Education Committee is charged with overseeing the academic quality and content of the curriculum. To fulfill this assignment, the committee will initiate specific strategies to promote academic breadth, depth and integrity, and to facilitate innovation in the programs offered to students.

Role of the Curriculum and General Education Committee:

The Curriculum and General Education Committee, a standing committee of the Academic Senate and Taft College, makes recommendations to the West Kern Community College District Board regarding:
_ New credit and non-credit courses and programs
_ Modifications to existing credit and noncredit courses and programs
_ Graduation requirements including general education requirements

The Curriculum and General Education Committee charge also includes these academic and professional matters as identified in Education Code 53200(c):
*Curriculum, including establishing prerequisites, co-requisites, and advisories and placing courses within disciplines
* Degree and certificate requirements
* Education program development
* Distance Education
* Standards on student preparation

SPECIFIC RESPONSIBILITIES:

1. Review and evaluate proposals to initiate or change courses and programs;
2. Assure that curriculum is well developed, clear and complete, and that its supporting documents adequately supplement the proposal;
3. Make recommendations to assist individuals to strengthen their course or program proposals;
4. Evaluate the impact of a curriculum proposal on the resources and other curricula of the college;
5. Provide guidelines and criteria for the development of new courses and programs;
6. Review and revise procedures associated with curriculum development;
7. Encourage and facilitate innovation in the curriculum;
8. Assure that assessment is built into the curriculum proposal;
9. Ensure student learning outcomes align with program and institutional outcomes;
10. Assure that the curriculum offered is complementary and integrated; and
11. Vice President of Instruction sends recommendations to the Board of Trustees upon passage of curriculum items.

TAFTCOLLEGE

MEMBERSHIP REPRESENTATION:
The Curriculum and General Education Committee consists of
Co-chairs:
Vice President of Instruction(non-voting)
Vice President of the Academic Senate

The following shall be voting members of the Curriculum committee:
Division Chairs (6) or designee
Counseling Representative
Articulation Officer
Director of Admissions and Records or designee
Student Learning Outcomes Coordinator

The following shall be non-voting members of the Curriculum committee:
Vice President of Student Services
Associate Student Representative & PTK Representative
Executive Assistant - Instruction
Senior Research Assistant
Instructional Technician- Curriculum (Ex-Officio member)
Director of Distance Education
Dean of Instruction and C.T.E (Career Technical Education)

Total: 19

MEMBERSHIP AND MEETING POLICIES:
Quorum is based on 50% + 1 of voting membership.
It is the responsibility of each member of the Curriculum and General Education Committee to attend each meeting and adhere to the College Code of Conduct.

MEETING SCHEDULE
Regular, monthly meetings during the academic year for a length of time will be determined by the committee with additional meetings during in-service.

Relationship with Other Committees

The Curriculum and General Education Committee reports to the Academic Senate. The Right to Appeal the recommendations of the committee can be made directly to the Academic Senate.

The Curriculum and General Education Committee relies on two committees to focus on specific tasks or issues.

The Distance Learning & Education Committee reviews and makes recommendations regarding whether to offer courses in an ~~hybrid or online modality.~~ distance education modality.

The Student Learning Outcomes Assessment Steering Committee (SLOASC) reviews all SLOs for clarity and measurability, including Program and Course level learning outcomes.

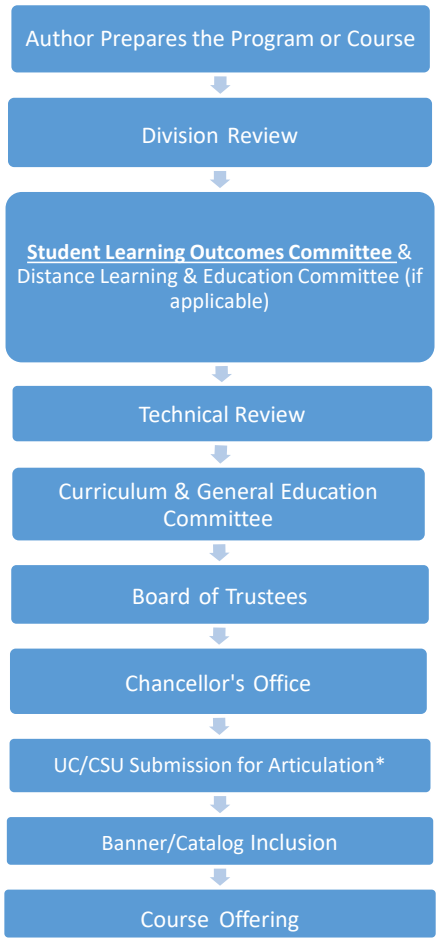
Formatted: No underline
Formatted: Indent: First line: 0"
Formatted: Indent: First line: 0"

TAFTCOLLEGE

Self-Evaluation:
The Curriculum and General Education Committee shall:

- Review/evaluate their performance at the end of each academic year
- Review/evaluate the Committee Charter at the beginning of each academic year

District Curriculum Approval Process:
The following chart designates the responsibility, review, and approval process that has been approved by the Board of Trustees (new flow chart not yet approved by the Board) and is in Taft College's Administrative Procedure (AP 4020):



ASTR	1511	Intro, to Astronomy & Lab	SCI
BIOL	2257	Human Physiology with Lab	SCI
BIOL	2201	Introductory Biology - Cells	SCI
BIOL	2259	Human Anatomy & Physiology II	SCI
BIOL	2258	Human Anatomy & Physiology I	SCI
BIOL	2202	General Zoology	SCI
BIOL	2203	General Botany	SCI
BIOL	2260	General Microbiology	SCI
BIOL	2265	Human Pathophysiology	SCI
BIOL	1510	Fundamentals of Biology w/ Lab	SCI
BIOL	2250	Human Anatomy	SCI
ENGR	2200	Statics	SCI
ENGR	2300	Materials Science & Engnr Lab	SCI
ESCI	1520	Introduction to Earth Science	SCI
GEOG	1510	Physical Geography	SCI
GEOL	1501	Historical Geology	SCI
GEOL	1500	Intro to Geology	SCI
MATH	2120	Analy. Geometry & Calculus II	SCI
MATH	2130	Analytic Geometry & Calc. III	SCI
MATH	1505	MathCncpts ElmntryTeach NumSys	SCI

DS	1501	Introduction to Disabilities	LRN
DS	1505	Teach Indiv. with Disibilities	LRN
DS	1507	Intro to Sprtng Ppl with Dsblt	LRN
DS	1502	Disabilities and the Law	LRN
DS	1503	Intro. to Medication Support	LRN
DS	1506	Sfty Advcy & Mltreatmnt Prvnt	LRN
EDUC	1500	Intro to Educational Tech	LRN
LIBR	1548	Intro to Library Research	LRN
LRSK	911	Basic Academic Prep in Spanish	LRN
LRSK	910	Basic Academic Preparation	LRN

ART	1500	Art Appreciation	BA&H
ART	1600	Two-Dimensional Design	BA&H
ART	1800	Introduction to Digital Art	BA&H
ART	1811	Graphic Design	BA&H
ART	1820	Comp Imaging:Adobe Photoshop	BA&H
BSAD	2220	Intro to Financial Accounting	BA&H
BUSN	1513	Work Experience in Business	BA&H
BUSN	2001	College Keyboarding & Doc Proc	BA&H
BUSN	1536	Introduction to Exporting	BA&H
BUSN	2280	Entrepreneurship	BA&H
BUSN	2900	Business Capstone	BA&H
BUSN	2003	College Keyboarding & Doc Proc	BA&H
BUSN	1510	Business Communication	BA&H
BUSN	2002	College Keyboarding & Doc Proc	BA&H
COMM	1590	Introduction to Persuasion	BA&H
DRAM	1535	Elementary Acting	BA&H
ECON	2120	Principles of Economics-Micro	BA&H
ECON	2210	Principles of Economics-Macro	BA&H
HUM	2010	Introduction to Film Studies	BA&H
JRNL	1510	Mass Comm. and the Individ.	BA&H
MGMT	1525	Time Management	BA&H
MGMT	1530	Conflict Resolution	BA&H
MGMT	1535	Decision Making & Prob. Solv.	BA&H
MGMT	1510	Values and Ethics	BA&H
MGMT	1545	Customer Service	BA&H
MGMT	1560	Management Capstone	BA&H
MGMT	1515	Communication	BA&H
MGMT	1520	Team Building	BA&H
MGMT	1565	Professionalism and Etiquette	BA&H
MGMT	1505	Principles of Supervision	BA&H
MGMT	1550	Attitude	BA&H
MGMT	2900	Management Capstone	BA&H
MGMT	1570	Diversity at Work	BA&H
MGMT	1500	Intro. to Human Resource Mgmt.	BA&H
MGMT	1540	Managing Organizational Change	BA&H
MGMT	1555	Stress Management	BA&H
PHOT	1510	Basic Photography	BA&H
SPAN	2001	Intermediate Spanish III	BA&H
SPAN	2002	Intermediate Spanish IV	BA&H

CIS	1812	Intro to Prestn Grphcs Pwr Pnt	AHAT
CIS	2020	Intro to Computer Info Systems	AHAT
CIS	1902	Intro to Database Micro-Access	AHAT
CIS	1532	Basic Internet Skls & Cncpts	AHAT
CIS	1603	Intro to Word Processing-Word	AHAT
CTRP	1513	Work Exp in Court Reporting	AHAT
CTRP	570	Legal Terminology I	AHAT
CTRP	590	Court Reporting Punct. & Gramm	AHAT
CTRP	710	Proofreading for the Court Rep	AHAT
CTRP	575	Legal Terminology II	AHAT
CTRP	580	Court & Deposition Procedures	AHAT
CTRP	642	100 WPM Shrthnd Spd-2 Voice	AHAT
DNTL	2241	Practice and Financial Mgmt	AHAT
DNTL	2025	Patient Mgmt and Geriatrics	AHAT
DNTL	2026	Nutrition in Dentistry	AHAT
DNTL	2134	Clinical Practice II	AHAT
DNTL	2131	Pharmacology	AHAT
DNTL	2245	Ethics and Jurisprudence	AHAT
DNTL	2243	Clinical Practice III	AHAT
DNTL	2240	Periodontics II	AHAT
DNTL	2024	Clinical Practice I	AHAT
DNTL	1513	Dntl Health Education/Seminar	AHAT
DNTL	1514	Introduction to Clinic	AHAT
ENER	1540	Fund of Program Logic Control	AHAT
ENER	1513	Work Experience in Energy Tech	AHAT
ENER	1530	Electricity & Basic Electronic	AHAT
ENER	1610	Mechanical Systems	AHAT
ENER	1510	Introduction to Energy	AHAT
ENER	1515	Fundamentals of Instr for Ener	AHAT
ENER	1503	Enviromental Awarenes Reg Comp	AHAT
ENER	1620	Fundamentals of Instrumentatio	AHAT
ENER	1520	Intro Petroleum Technology	AHAT
ENER	2900	Energy Technology Capstone	AHAT
ENER	1630	Energy Analytics	AHAT
HLED	1543	Medical Term for Court Report	AHAT
HLED	1541	Medical Terminology	AHAT
HLED	1510	Principles of Healthful Living	AHAT
HLED	1531	Emergency Medical Tech Refresh	AHAT
HLED	1535	Emergency Medical Technician	AHAT
IES	1513	Work Exp in Industrial Educ	AHAT
INTC	1100	Ind. Technology Capstone	AHAT
INTC	2900	Industrial Technology Capstone	AHAT
PETC	1103	Basic Drilling Surface Stack	AHAT
PETC	1105	Coiled Tubing for Supervisors	AHAT

PETC	1104	Basic Drilling & Workover Sub	AHAT
PHED	1507	Intercollegiate Softball	AHAT
PHED	1644	Introduction to Phys Education	AHAT
PHED	1721	Offseason Intercollegiate Golf	AHAT
PHED	1732	Advanced Low Impact Aerobics	AHAT
PHED	2509	Adv Women's Intercol Volleybll	AHAT
PHED	2734	Offsns Adv Intercoll Bask PE	AHAT
PHED	1506	Mens Intercollegiate Golf	AHAT
PHED	1646	Tchnques In Athletic Taping I	AHAT
PHED	1724	Offseason Intercoll Softball	AHAT
PHED	1528	Beginning Volleyball	AHAT
PHED	1734	Offseason Intercoll Basketball	AHAT
PHED	1735	Offseason Intercoll Baseball	AHAT
PHED	2506	Adv Mens Intercollegiate Golf	AHAT
PHED	1505	Womens Intercollegiate Golf	AHAT
PHED	1509	Women's Intercoll Volleyball	AHAT
PHED	1523	Beginning Weight Lifting	AHAT
PHED	1529	Water Aerobics	AHAT
PHED	1533	Walking for Fitness	AHAT
PHED	1623	Intermed Weight Lifting	AHAT
PHED	2511	Adv Men's Intercoll Soccer	AHAT
PHED	1514	Intercollegiate Baseball	AHAT
PHED	1539	Fundamentals of Baseball	AHAT
PHED	1643	Sports Officiating	AHAT
PHED	1729	Advanced Water Aerobics	AHAT
PHED	1823	Elite Weight Lifting	AHAT
PHED	2505	Adv. Womens Intercoll Golf	AHAT
PHED	2507	Advanced Intercoll. Softball	AHAT
PHED	2510	Adv Women's Intercoll Soccer	AHAT
PHED	2514	Adv Intercollegiate Baseball	AHAT
PHED	1520	Beginning Golf	AHAT
PHED	1534	Basketball and Phys Fitness	AHAT
PHED	1535	Baseball and Phys Fitness	AHAT
PHED	1649	Beginning Athletic Training	AHAT
PHED	1723	Advanced Weight Lifting	AHAT
PHED	1742	Offseason Intercoll Soccer	AHAT
PHED	1524	Softball	AHAT
PHED	1532	Low Impact Aerobics	AHAT
PHED	1542	Beginning Soccer	AHAT
PHED	1728	Offseason Intrcoll Volleyball	AHAT
PHED	1510	Women's Intercoll Soccer	AHAT
PHED	1511	Men's Intercollegiate Soccer	AHAT
PHED	1629	Intermediate Water Aerobics	AHAT

CJA	2131	Control and Supv in Correction	SOC
CJA	2133	Legal Aspects of Corrections	SOC
CJA	2134	Correction Interview & Counsel	SOC
ECEF	1654	Discip. Tech. for School Age	SOC
ECEF	1500	Intro. to ECE:Princip. & Pract	SOC
ECEF	1531	The Child in Family/Comm Relat	SOC
ECEF	1511	Creative Experiences for Child	SOC
ECEF	1590	Health, Safety & Nutrition	SOC
PSYC	2080	Intro to Lifespan Psychology	SOC
PSYC	1520	Psychology as a Profession	SOC
PSYC	2003	Child Growth and Development	SOC
PSYC	2033	Personal & Social Adjustment	SOC
SOC	2110	Intro to Race and Ethnicity	SOC

EDUC	1520	Intro to Elem Ed for Contem Ed	ENGL
ENGL	1650	Introduction to Literature	ENGL
ENGL	1725	Creative Writing: Poetry	ENGL
ENGL	1750	Creative Writing: Fiction	ENGL
ENGL	2100	American Literature I	ENGL
ENGL	1600	Crit Think, Lit, & Composition	ENGL
ENGL	1700	Intro Creative Writing	ENGL
ENGL	2650	World Literature 2	ENGL
ENGL	2700	British Literature 1	ENGL
ENGL	1775	Creative Writing: Nonfiction	ENGL
ENGL	2750	British Literature 2	ENGL