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| **PROGRAM NAME:** Civil Engineering Field of Study | **AUTHORING TEAM CONTACT:** Katherine Hedberg |
| **PHONE:** 9725531182 | **EMAIL:** katherinehedberg@colln.edu |

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| GUIDELINES  Time Frames   1. Scope:   The time frame of program review is five years, including the year of the review.  Data being reviewed for any item should go back the previous four years, unless not available.   1. Deadline Dates:   January 15th – Program Review Document due to Department Dean for review (Deans may require submissions at their own, earlier due date)  February 1st – Program Review Document due to Program Review Steering Committee   1. Years:   Years 1 & 3 – Implement Action Plan of (CIP) and collect data  Years 2 & 4 – Analyze data and findings, Update Action Plan  Year 5 – Write Program Review of past 5 years; Write Continuous Improvement Plan (CIP) and create new Action Plan  LENGTH OF RESPONSES: Information provided to each question may vary but should be generally kept in the range  of 1-2 pages or 500-1,000 words.  **EVIDENCE GUIDELINES**: In the following sections, you will be asked to provide evidence for assertions made.   1. Sources: This evidence may come from various sources including professional accreditation reviews, THECB, Texas Workforce Commission’s CREWS, Institutional Research Office (IRO), National Student Clearinghouse, IPEDS, JobsEQ, EMSI Career Coach, and may be quantitative and/or qualitative. If you are unfamiliar with any of these information sources, contact the Institutional Research Office at: [effectiveness@collin.edu](mailto:effectiveness@collin.edu). Use of additional reliable and valid data sources of which you are aware is encouraged. 2. Examples of Evidence Statements: 3. Poor example: Core values are integrated into coursework. (Not verifiable) 4. Good example: Core values are integrated into coursework through written reflections. (Verifiable, but general) 5. Better example: Core values are integrating into coursework through written reflections asking the student to describe how s/he will demonstrate each of the core values in his or her professional life and demonstrated through service learning opportunities. (Replicable, Verifiable)   **FOR MORE INFORMATION:**The Program Review Portal can be found at<http://inside.collin.edu/institutionaleffect/Program_Review_Process.html>*.* Any further questions regarding Program Review should be addressed to the Institutional Research Office ([effectiveness@collin.edu](mailto:effectiveness@collin.edu), 972.599.3102). |

**Introduction/Preface**

**EXECUTIVE SUMMARY**

**Briefly summarize the topics that are addressed in this self-study, including areas of strengths and areas of concern. (Information to address this Executive Summary may come from later sections of this document; therefore, this summary may be written after these sections have been completed.)** Please do not include information in this section that is not already provided elsewhere in this submission. Using the questions in the template as headings in the Executive Summary can provide structure to the overview document (see below for suggested format).

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| **Executive Summary (suggested sections/format-not required format)**  What does our program do?  Why do we do the things we do: Program relationship to the College Mission & Strategic Plan.  Why we do the things we do? Program relationship to student demand.  Why we do the things we do? Program relationship to market demand.  How effective is our curriculum and how do we know?  How effectively do we communicate, and how do we know?  How well are we leveraging partnership resources and building relationships, and how do we know?  How have past Continuous Improvement Plans contributed to success?  How will we evaluate our success? |

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Section I. *Are We Doing the Right Things?*

**1. WHAT DOES OUR ACADEMIC PROGRAM DO?**  
 **What is the program and its context?**This section is used to provide an overview description of the program, its relationship to the college and the community it serves. **Keep in mind the reviewer may not be familiar with your area**. Therefore, provide adequate explanation as needed to ensure understanding.

*Suggested points to consider:*

* *Program’s purpose (Include the program’s mission statement if one exists.)*
* *Program learning outcomes or marketable skills*
* *Brief explanation of who the program serves*
* *Degree paths it prepares graduates to enter*
* *What regulatory standards must the program meet (THECB, Workforce, external accreditation)*

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| ***Program’s purpose:***  The Civil Engineering Field-of-Study program teaches the foundational engineering concepts needed to transfer to a four-year institution where students can complete their civil engineering degree. These concepts include basic analysis of structures, systems in motion and in equilibrium, basic material behavior, as well as some computer drafting. Students develop these skills through practice problems, assignments, and in-class exercises with peers and their instructors. Upon completion of the program, students are ready to succeed in advanced engineering design courses.  ***Program learning outcome or marketable skills:***  During completion of the Civil Engineering Field-of-Study, students will develop the following marketable skills:   * Perform calculations in the areas of Statics and Dynamics. * Apply principles of physics to analyze various civil engineering designs. * Analyze various design solutions. * Analyze structural forces. * Communicate effectively and professionally. * Work collaboratively with others to achieve goals. * Analyze data critically to reach sound conclusions.   *Source: Collin College Programs and Courses* [*https://www.collin.edu/academics/programs/MrktSkills\_CivilEng.html*](https://www.collin.edu/academics/programs/MrktSkills_CivilEng.html)  *Brief explanation of who the program serves:*  The Civil Engineering Field of Study serves students who are planning to earn a bachelor’s degree in the field of civil engineering.  *Degree paths it prepares graduates to enter:*  Students who have completed a Civil Engineering Field are ready to smoothly transition into a baccalaureate degree program for civil engineering.  *Source: Collin College Transfer Programs* <https://www.collin.edu/transferu/>  *What regulatory standards must the program meet (THECB, Workforce, external accreditation)*  The Civil Engineering Field of Study falls under the regulation of the Texas Higher Education Coordinating Board (THECB). |

**2. WHY DO WE DO THE THINGS WE DO: PROGRAM RELATIONSHIP TO THE COLLEGE MISSION & STRATEGIC PLAN.**

* **Provide program-specific evidence of actions that document how the program supports the College’s** [**mission statement**](https://www.collin.edu/aboutus/)**:** “*Collin County Community College District is a student and community-centered institution committed to developing skills, strengthening character, and challenging the intellect.”*
* **Provide program-specific evidence that documents how the program supports the College’s strategic plan (2020-2025 Strategic Plan)**: <https://www.collin.edu/aboutus/strategic_goals.html>.

*Suggested/possible points to consider:*

* *What evidence is there to support assertions made regarding how the program relates to the mission and strategic plan?*
* *Think broadly-increasing completion, pathways to 4-yr and from high schools, etc.*
* *Analyze the evidence you provide. What does it show about the program?*

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| ***rovide program-specific evidence of actions that document how the program supports the College’s mission statement: “Collin County Community College District is a student and community-centered institution committed to developing skills, strengthening character, and challenging the intellect.”***  **Mission statement: “**Collin County Community College District is a student and community-centered institution committed to ***developing skills***, strengthening character, and challenging the intellect.”  The field of civil engineering is about problem solving by applying creative solutions to everyday challenges within a highly technical framework. Training future engineers requires attention to detail as their math and science skills are sharpened, their ability to think critically is honed, and their professional ethics are developed.  Our students have these skills developed in all the engineering courses offered in our program. As noted earlier, a selection of specific examples of marketable skills developed in this program are provided below:   * + Apply principles of physics to analyze various civil engineering designs   + Communicate effectively and professionally.   + Work collaboratively with others to achieve goals.   + Analyze data critically to reach sound conclusions.   All of these are pivotal to successful performance as a civil engineering student, a practicing civil engineer, and, arguably, any other technical field.  **Mission statement: “**Collin County Community College District is a student and community-centered institution committed to developing skills, ***strengthening character***, and challenging the intellect.”  The field of civil engineering is about serving, whether that is through designing, building, retrofitting, or maintaining the infrastructure that allows society to function. Students who choose the field of civil engineering can expect to make a real, practical difference in the lives of their fellow citizens.  Our students are encouraged in these endeavors in our ENGR2301: Statics, ENGR2302: Dynamics, and ENGR2332: Mechanics of Materials courses. All three have classroom examples specifically selected from the text, literature, and faculty experience in industry to show students the way that their calculations, in concert with their professional ethics, will matter. This practical map between in-class performance and future professional outcomes helps to strengthen their character and affix a dedication to care for their projects, contractors, and the project’s end users.  **Mission statement: “**Collin County Community College District is a student and community-centered institution committed to developing skills, strengthening character, and ***challenging the intellect***.”  All engineering courses challenge the intellect. Engineering course include both theory and practical application of theory, with a rigorous technical component. Selected learning outcomes that support this statement are listed below:   * + ENGR2301: Mechanics 1 (Statics)     - State the fundamental principles used in the study of mechanics.     - Determine unknown forces and couples acting on objects in equilibrium.   + ENGR2332: Mechanics of Materials     - Calculate stress, strain and deflection in statically determinate and indeterminate members subject to axial, bending, torsional, thermal, and pressure loads, both individually and in combination.     - Transform stresses and strains from one coordinate system to another.   The Engineering Field of Study faculty also serve on a range of campus and district-wide committees that support Collin College’s mission that include, but are not limited to:   * + Society of Women Engineers (Professor Susan Stancy Abraham)   + Collin Online Academic Integrity Defense (CO-AID) committee (Dr. Katherine Hedberg)   + Collin Foundation Scholarship Committee (Dr. Katherine Hedberg)   ***Provide program-specific evidence that documents how the program supports the College’s strategic plan (2020-2025 Strategic Plan): https://www.collin.edu/aboutus/strategic\_goals.html.***  The Civil Engineering FOS program supports Collin College’s Strategic Goals in the following ways:  **Strategic Goal 3: Create and implement comprehensive integrated pathways to support student transitions.**  The Civil Engineering Field of Study program has multiple well-established pathways for transfer. However, the total number is limited by the very few civil engineering programs within the immediate local area (only two within the entire Dallas-Ft Worth metro area). Existing pathways include:   * [University of Texas at Arlington – Civil Engineering](https://www.collin.edu/transferu/2021pathways/CC_UTA%20Civil%20Engineering.pdf) * [University of Texas at Tyler – Civil Engineering](https://www.collin.edu/transferu/2021pathways/CC_UTT%2021-22%20Civil%20Engineering%20AS%20to%20BS%20edit.pdf)   Source: *Engineering Department Transfer Pathways,* https://www.collin.edu/academics/programs/FOS\_Eng\_1Overview.html  **Strategic Goal 4: Implement the third Baccalaureate degree by Fall 2022 and continue adding 2+2 programs with university partners.**  As noted above, there are currently two formal transfer pathways in place for civil engineering (replicated below).   * [University of Texas at Arlington – Civil Engineering](https://www.collin.edu/transferu/2021pathways/CC_UTA%20Civil%20Engineering.pdf) * [University of Texas at Tyler – Civil Engineering](https://www.collin.edu/transferu/2021pathways/CC_UTT%2021-22%20Civil%20Engineering%20AS%20to%20BS%20edit.pdf)   Source: *Engineering Department Transfer Pathways,* <https://www.collin.edu/academics/programs/FOS_Eng_1Overview.html> |

**3. Why we do the things we do: Program relationship to student demand**

Make a case with evidence to show that students want to enroll in the program. Discuss whether or not there appears to be any disproportionate enrollment by gender, race, or ethnicity (compared to Collin College’s overall student demographic distribution <http://inside.collin.edu/iro/programreview/prfilehostpage.html>). If any differences exist discuss possible reasons why the gap exists, and plans to address these issues to close gaps in enrollment rates between groups of students (refer to the Program Review portal for Enrollment Reports and Average Section Size data file <http://inside.collin.edu/institutionaleffect/Program_Review_Process.html>).

*Suggested/possible points to consider:*

* *The number of students who completed the award in each of the last 5 years.*
* *What is the enrollment pattern? Declining, flat, growing, or not exhibiting a stable pattern; please explain.*
* *What are the implications for the next 5 years if the enrollment pattern for the past 5 years continues?*
* *Describe any actions taken to identify and support students enrolled in program-required courses early in the degree plan. Are there any specific supports for a diverse student population? If no actions are taken at the present, please develop and describe a plan to do so.*
* *Analyze the evidence you provide. What does it show about the program?*

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| ***Considering gender:***  Our program follows the general trends in undergraduate engineering. Nationally, approximately 27.6% of civil engineering degrees were earned by females. This matches Collin College’s enrollment data, as shown below in Figure 1: Gender by Year. The Civil Engineering FOS program has approximately 25% female student population. The program dipped briefly in 2020, but has returned to the mid-to-high twenties in years 2021, 2022, and 2023.  *Source: American Society of Civil Engineers (ASCE) Demographic Report, https://www.asce.org/-/media/asce-images-and-files/diversity-equity-and-inclusion/documents/asce-demographic-profile-report.pdf*  *Source: Society of Women Engineers, Women in Engineering: Analyzing 20 Years of Social Science Literature. https://magazine.swe.org/lit-review-22/*  *Source: Institutional Records Office, j:\\IRO\Robinson\Data\2023-24\Engineering FOS – Civil\Civil Engineering – Unduplicated Enrollment).*    Figure 1: Demographic Data - M/F Ratios, Civil Engineering  ***Considering demographic information:***  As for demographic information, the engineering programs align with the general enrollment data for the College as a whole with no group varying by more than 6% percent (Figure 2: Demographic Data)    Figure 2: Demographic Data - by Race Ratios, Civil Engineering  ***Considering enrollment:***  The enrollment has increased dramatically over the past five years. The civil engineering program has seen continued, tremendous growth from 16 enrolled students in Fall 2018 to 164 enrolled students in Fall 2021. There was a drop in student enrollment in Fall 2022 to 112 enrolled students. This may be attributed to a shifted focus onto the Mechanical Engineering Field-of-Study, which competes for the same student cohort. That program saw a similar sized bump upward in student enrollment for the Fall 2022 semester.  This drop may or may not indicate a pattern; review of the enrollment data next year would be important to determine if this was a signal of program changes, or simply a one-time dip in the number of students interested in civil engineering. However, as the Civil Engineering FOS program has been suspended by the THECB, this data will not be available. Overall enrollment in the engineering courses used for this field-of-study has trended up by an order of magnitude. |

### **4. WHY WE DO THE THING WE DO: WHAT MARKETABLE SKILLS SHOULD STUDENTS HAVE AFTER COMPLETING OUR PROGRAM?**

**Make a case with evidence to show that the program teaches skills that are useful in the workplace.**

*Suggested/possible points to consider:*

* *What foundational skills and knowledge do employers say they want?*
* *Provide evidence from national, state, and/or local employer surveys, studies, editorials and other sources that identify current employer expectations for baccalaureate graduates in program-related fields.*

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| While completing the Civil Engineering Field of Study, students will acquire the following marketable skills:   * Perform calculations in the areas of Statics and Dynamics. * Apply principles of physics to analyze various civil engineering designs * Analyze various design solutions. * Analyze structural forces. * Communicate effectively and professionally. * Work collaboratively with others to achieve goals. * Analyze data critically to reach sound conclusions.   All of these skills are fundamental to engineering applications, but also translate seamlessly into non-technical fields.  Source: https://www.collin.edu/academics/programs/MrktSkills\_CivilEng.html |

Section II. *Are We Doing Things Right?*

### **5. HOW EFFECTIVE IS OUR CURRICULUM, AND HOW DO WE KNOW?**

**A. Make a case with evidence that there are no curricular barriers to completion. Review data related to course retention rates, course success rates, and the frequency with which courses are scheduled to identify barriers to program completion and transfer pathways.**

*Suggested/possible points to consider:*

* *FOS only: Given that FOS courses are defined by the state; what actionable barriers are seen?*
* *For Core only: Do all course options have sufficient enrollment to continue their inclusion in core?*
* *For Core and FOS certificates: What steps can be taken to improve course completion/success rates, course enrollment, and scheduling frequencies for specific courses?*
* *Program course retention and success rates: Attach the relevant information from the Program Review Data Set on the Institutional Research Office’s intranet page.*
* *Identify and discuss all courses that have a retention rate below 78% (Carl Perkins’ standard).*
* *Using assessment evidence and instructor observations, identify the student learning outcomes that are the greatest challenges for students. Identify any additional barriers to student success.*

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| ***FOS only: Given that FOS courses are defined by the state, what actionable barriers are seen?***  The Civil Engineering Field-of-Study is regulated by the Texas Higher Education Coordinating Board. The Civil Engineering FOS program has been suspended by the THECB and is no longer an option for students to select beginning January 2024. There is no current timeline for reinstituting the program.  ***For Core and FOS certificates: What steps can be taken to improve course completion/success rates, course enrollment, and scheduling frequencies for specific courses?***  The engineering course enrollment has been increasing exponentially. In this most current academic year (AY2023/2024), the department has run a section of ENGR2332: Mechanics of Materials in both the fall and spring semester for the first time. The ENGR2302: Dynamics course has increased enrollment from 9 students to 22 students, and the ENGR2301: Mechanics 1 (Statics) course ran two sections, one completely full at 24/24 seats filled and the other nearly full, with 19/24 seats filled. The program is in demand and thriving. |

**B. Show evidence that the state standard for award completion has been met.**

**Completers Standard: Average 25 completers over the last five years or an average of at least five completers per year.**  
Number of completers: 2 in last five years.  
If below the state standard, attach a plan for raising the number of completers by addressing barriers to completion and/or by increasing the number of students enrolled in the program. Definition of completer—a student who has received an award.

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| This metric is complicated by several factors. First, the Civil Engineering FOS program was newly implemented at the beginning of this program review cycle (AY2018-2019). Some time to bring advisors and students up to date with the new options is to be expected. Second, the majority of engineering program completers during this time were enrolled in the Engineering Field-of-Study program, suspended prior to AY 2018-2019. Considering any of the new tracks for engineering, including Civil Engineering, Mechanical Engineering, and Electrical Engineering Field-of-Study, without the old legacy Engineering Field-of-Study will yield an incomplete picture of the program *(Figure 3: Engineering Program Completers by Academic Year*). Third, students who complete either the Civil Engineering FOS or the Mechanical Engineering FOS remain competitive for transfer and admission into either program at a four-year institution. In fact, variation between programs, particularly between the Civil Engineering FOS and the Mechanical Engineering FOS programs comes down to a single course. There were multiple students in the AY2022-2023 who completed the Mechanical Engineering FOS program, but transferred into a civil engineering program.  *(Source: Personal communication, email, Prof. Katherine Hedberg)*    Figure 3: Engineering Program Completers by Academic Year  (*Source: Institutional Records Office, J:\\IRO\Robinson\Data\Katherine Hedberg - ENGR Program Completers).* |

**C. For any required program courses where there is a pattern of low enrollment (averaging fewer than 15 students), explain your plan to grow enrollment.**

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| None of the required courses have low enrollment. |

**D. Make a case with evidence that the program is well-managed.**

*Suggested/possible points to consider**(Data can be found at* [**http://inside.collin.edu/institutionaleffect/Program\_Review\_Process.html**](http://inside.collin.edu/institutionaleffect/Program_Review_Process.html)**):**

* Average class size
* *Grade distributions*
* *Contact hours taught by full-time and part-time faculty*
* *Identify all courses that have a success rate below 75%. Using assessment evidence and instructor observations, identify the student learning outcomes that are the greatest challenges for students in courses with low success rates. Explain what instructional and other intervention(s) might improve success rates for each identified course.*
* *Student satisfaction: What evidence do you have that students are satisfied with the program? What kinds of complaints are made to the associate dean by program students?*

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**6. How effectively do we communicate, and how do we know?**

**A. Make a case with evidence that the program literature and electronic sites are current, provide an accurate representation of the program, and support the program’s recruitment plan, retention plan and completion plan.**

*Suggested/possible points to consider:*

* *Demonstrate how the program solicits student feedback regarding its website and literature and how it incorporates that feedback to make improvements.*
* *How does the program ensure that students are informed/aware of program literature? Is program literature made accessible to all students (i.e. can they obtain the information they need)?*
* *Designate who is responsible for monitoring and maintaining the program’s website, and describe processes in place to ensure that information is current, accurate, relevant, and available.*

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**B. In the following Program Literature Review Table, document that the elements of information listed on the website and in brochures (current academic calendars, grading policies, course syllabi, program handouts, program tuition costs and additional fees, description of articulation agreements, availability of courses and awards, and local job demand in related fields) were verified for currency, accuracy, relevance, and are readily available to students and the public. Please fill out the table only for this prompt (B.), no analysis is necessary here.**

**Program Literature Review Table**

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| Title | Type (i.e. URL, brochure, handout, etc.) | Date of Last Review/Update |  | Responsible Party |
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**7. How well are we leveraging partnership resources and building relationships, and how do we know?**

**Partnership Resources: On the table below, list any business, industry, government, college, university, community, and/or consultant partnerships, including internal Collin departments, to advance the program outcomes.**

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**Partnership Resources Table**

|  |  |  |  |
| --- | --- | --- | --- |
| Partner/Organization | Description | Formal Agreement Duration,  if any. | How is it Valuable to the Program? |
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**8. What professional developmental opportunities add value to your program?**

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| The faculty in the engineering department prioritize professional development, as seen in the table below. |

**Provide a List of professional development activities employees have participated in since the last program review.**

**Employee Resources Table\*\***

|  |  |  |  |
| --- | --- | --- | --- |
| Employee Name | Role in Unit | Professional Development Summary | How is it Valuable to the Unit? |
| Tripat Baweja | FT Faculty | Attended Communication Cues Live Webinar Series: “Counteract Conditioned Thinking”, “Positive Non-Verbals”, “Assert Yourself with Empathy”, Society of Women Engineers, July 2019  "Innovations in Additive Manufacturing: Landscape and New Solutions", Live online seminar by SWE (Society of Women Engineers), 8/15/2019  Attended Professional Development meeting and tour of Frito-Lay/PepsiCo Research Facility in Plano, hosted by Dallas Society of Women Engineers, 8/27/2019 | These activities helped with better class management and student interactions. It also helped in discussions about recent technologies and real-life engineering applications in the classroom |
| Katherine Hedberg | FT Faculty | ATC Design Guide 2, Basic Wind 6/2/21 Engineering for Low-Rise Buildings  Embankments, Dams and Slopes Technical Committee Presentation on Impacts of Recent Extreme Events; Ignacio Harrouch, PE, Ben Leshchinsky, Ph.D., PE, M. ASCE, Daniel Pradel, Ph.D., PE, M. ASCE, Joseph Wartman, Ph.D., PE – ASCE continuing education 2/24/2022  Attended Collin College Spring 2022 faculty development conference including:  Spring 2022 Faculty Development Conference, attended: Why Paying Careful Attention Matters, Linda Sears. 1/6/22  Design and Construction of Water and Wastewater Facilities, by David Eastwood, offered through ASCE (American Society of Civil Engineers, Texas Section) Professional development hours (PDH) earned. 7/28/2022  Attended web seminar outlining updates to NAVFAC DM 7.1 (pivotal resource for practicing engineers, design manual resource), 9/29/2022  Collin College, Spring 2023 Faculty Development Conference, 1/5/23, including:  The Triple A's: Creating Assignment Assessments that Align! Les Stanaland, Linda Sears, Alicja Usarek, Kevin Suber, Sudha Madhugiri, Serena Richards, 10:00-10:50am  Never Ending Challenge: Student Engagement, Tripat Baweja, 11:00-11:20am  The Importance of an Organized Canvas Presence; N. Marlo Ballard, Benedict Nguyen-Lee, 11:30-11:50am  GEOSTRATA (offered by American Society of Civil Engineers, Geotechnical Engineering Institute) Extra S04 E02 session, Remote Sensing, with Demetrios Zekkos (UC Berkeley) May 4, 2023, 1:00pm – 2:00pm  Invited reviewer for annual international conference. Reviewed two state-of-the-art papers. June 2023 | These workshops, webinars, and conferences were valuable for several reasons. First, they helped ensure that course material remained targeted to current civil engineering industry practice. Second, they provided practical applications of academic concepts that could be woven into engineering courses. Third, targeted teaching workshops helped to improve (a) engagement in the classroom in these highly technical courses and (b) overall Canvas presence. |
| Krishna Aryal | PT Faculty | -Attended Collin College Spring 2022 faculty development conference, including:  Spring 2022 Faculty Development Conference, attended: Why Paying Careful Attention Matters, Linda Sears. 1/6/22  - Completed “STOP THE BLEED COURSE” to get CPR certification 11/11/2020  - Completed QM Rubric certification 04/09/2020  - Completed “Team Based Learning (TBL) certification 05/28/2023 | These workshops/certifications helped with engagement in the classroom in highly technical courses. It also helps students' safety and interactions. |
| Zhiquang Wang | Click or tap here to enter text. | 2/10-13/2019, Solidworks World 2019, Dallas, TX;  8/20/2019: Solidworks Simulation Solutions, vitual, webinar;  2/9-12/2020: 3DExperience World 2020, Nashville, TN;  2/19/2020: Introduction to Solidworks Visualize, Webinar, MLC;  9/22-23/2020: Additive Manufacturing for Aerospace, Lighting Talk & Virtual Lab Series, MakerBot;  11/17-20/2020: Autodesk University 2020, Digital Conference;  1/12-14/2021: Solid Edge Fundamental Training, online training;  3/11/2021: The Shredder: Understand the Simulation, Solidworks Live Design webinar, Dassault System;  10/5-14/2021: Autodesk University 2021, Digital Conference;  2/7/-2/9/2022: 3DExperience World, virtual conference;  6/22/2022: 3DExperience Data Management, MLC CAD systems, webinar;  9/14/2022: Smart manufacturing 101 webinar, Delmiaworks.  9/27/2022: Autodesk University Conference, virtual conference.  11/30/2022: 3DExperience Simulations webinar, MLC CAD systems.  3/1/2023: Introduction to SolidWorks API, MLC CAD Systems  7/12/2023: Working with Scanned Data in Solidworks. MLC CAD Systems.  8/16/2023: Solidworks Flow Simulation CFD Tips & Tricks. MLC CAD Systems.  11/13/2023: Autodesk University Conference, virtual conference. | These conferences/webinars  provide valuable information on recent developments in engineering design/graphics area, which helps the development of our engineering graphics course at the college. |
| Susan Stancy Abraham | FT Faculty | Applying the Quality Matters Rubric APPQMR workshop (12/15/2020 ‐ 12/16/2020)  Collin College Faculty Development Conference Spring 2021:   * Plenary Session: "The Hidden Learning Disability of Anxiety, Stress, and Trauma: Science and Strategies for Improving Learning" by Dr. Janet Zadina   Solid Edge Fundamentals Training ﴾01/12/2021 ‐ 01/13/2021﴿  WE 21 - National Conference of the Society of Women Engineers, virtual event (Oct. 21-23,2021)   * Session: “Letting Others Lead” – Barbara Humpton, CEO, Siemens USA. * Session: Empowering Women through P.I.E • I gained insight into the three aspects of Performance, Image, and Exposure in an organization.   Collin College Spring 2022 Faculty Development Conference   * Keynote: Powerful teaching – Unleashing the Science of Learning, Dr. Pooja K. Aggarwal * Session: Thinking, Teaching and Assessing Across Disciplines • I was introduced to and inspired by the concept of a cross-discipline learning community, where students and professors from two different courses came into a single learning environment and learned from each other. * Session: Adventures in Assessment • This session introduced me to innovative cross-disciplinary assessment strategies. * Session: Beat the Cheat – Ensuring Academic Integrity in Online Classrooms • This session taught me how to prevent cheating by changing assessment formats.   Center for Teaching and Learning Session: Easier Grading and meaningful evaluation through rubrics (Feb 2022)    Collin College Fall 2023 Faculty Development Day:   * “Reducing student resistance leads to better learning and happier faculty” – Dr. Anton Tolman, Utah Valley University.   WE 22 - The Society of Women Engineers (SWE) national conference at Houston – Oct 20-22, 2022  Collin College Spring 2023 faculty development conference:   * “Using Breakout Activities to Increase Student Engagement” by Stephen Gonzales * “Transactional Grace & Accountability in the Post-COVID Classroom” by Ryan Farrar * “Virtually Prepared: Presentation Practice for Your Students Using Virtual Reality” Whitney Pisani, Jenny Warren * “Using Perusall for Collaborative Reading Assignments” Rebecca Orr   SWE local conference in Seattle (Mar 31-April 1, 2023) This was a regional conference held by the Society of Women Engineers. I attended multiple sessions by leading tech and engineering companies like Space X, Microsoft, Toyota, SoCal Gas, and Amazon. | These conferences and webinars were useful in enhancing my knowledge of the current trends in Civil  Engineering, and improving pedagogical methods and student engagement. |
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\*\*For convenience, if providing a listing of professional development activities, this list may be included in this document as an appendix.

**9. Are facilities, equipment, and funding sufficient to support the program? If not, please explain.**

**[OPTIONAL—Only respond to prompt 9 if you are requesting improved resources for your program. If current facilities and budget are adequate, please proceed to prompt 10.]**

**Make a case with evidence that current deficiencies or potential deficiencies related to facilities, equipment, maintenance, replacement, plans, or budgets pose important barriers to the program or student success.** As part of your response, complete the resource tables, below, to supportyour narrative.

*Possible points to consider:*

* *The useful life of structure, technologies and equipment*
* *Special structural requirements*
* *Anticipated technology changes impacting equipment sooner than usual*
* *If you plan to include new or renovated facilities or replacement of equipment in your Continuous Improvement Plan, be sure to provide qualitative and/or quantitative data evidence of the need in this section.*

|  |
| --- |
| Facilities and budget are sufficient at this time. The department has identified areas with opportunities for growth, in course offerings, lab equipment, and program partnerships. These will be explored independently by the department, as the Civil Engineering FOS has been suspended. |

**Facilities Resources Table\*\***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Significant Pieces of Equipment | Description  (i.e. Special Characteristics) | Meets Needs (Y or N):  Current For Next 5 Years | | Analysis of Equipment Utilization |
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**Equipment/Technology Table ($5,000 or more) \*\***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Current Equipment Item or Budget Amount | Description | Meets Needs (Y or N):  Current For Next 5 Years | | For any “N”, justify needed equipment or budget change |
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**Financial Resources Table\*\***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Source of Funds (i.e. college budget, grant, etc.) | Meets Needs (Y or N):  Current For Next 5 Years | | For any “N”, explain why | For any “N”, identify expected source of additional funds if needed |
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Section III.Continuous Improvement Plan (CIP)

**10. How have past Continuous Improvement Plans contributed to success?**

Program Review at Collin College takes place for each award-issuing program every five years. During the last (fifth) year, the program evaluates the data collected during the CIP process.

**Please describe how you have used your Continuous Improvement Plan (CIP) to make the following improvements to your program over the past 4 years (your last program review can be found on the Program Review Portal):**

* 1. **Program Learning Outcomes/Program Competencies**
  2. **Overall improvements to your program**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| The Civil Engineering Field-of-Study program identified the following improvement and assessment targets for use in the department’s Continuous Improvement Plan (CIP). These targets are listed below, for 2021-2022 and 2022-2023. The targets were met; as a result, these were reevaluated, and new targets developed for the upcoming cycle.  Prior to AY 2021-2022, only one CIP document was required for all Engineering Field-of-Study programs. As a result, comments about targets for those years cannot be addressed here.   |  |  |  | | --- | --- | --- | | **A. Expected Outcome(s)**  Results expected in this unit (e.g., Authorization requests will be completed more quickly; Increase client satisfaction with our services) | **B. Measure(s)**  Instrument(s) / process(es) used to measure results  (e.g., survey results, exam questions, etc.) | **C. Target(s)**  Level of success expected (e.g., 80% approval rating, 10-day faster request turn-around time, etc.) | | * Students will be able to apply principles of physics to analyze forces acting on stationary engineering structures and systems. | Two-unit exams containing questions on structural analysis of frames and machines composing 50% of each exam grade (ENGR 2301) | Min. 70% on each exam assessments by 70% of the students | | * Students will be able to analyze engineering structures and systems involving the motion of particles and rigid bodies | Unit exam on planar motion analysis and kinetic equation of motion (ENGR 2302) | Min. 70% on exam assessment by 70% of the students | | * Students will be able to perform stress, strain and deformation analysis of engineering structures and systems. | Unit exam on calculation of stress and strain, and their transformation from one coordinate system to another (ENGR 2332) | Min. 70% on exam assessment by 70% of the students | | * Students will be able to create engineering drawings using industry software. | Final project to create engineering drawings with 2D and 3D views using advanced CADD (ENGR 1304) | Min. 70% on project assessment by 70% of the students |   Figure 4: CIP Plan for AY 2021-2022   |  |  |  | | --- | --- | --- | | **A. Expected Outcome(s)**  Results expected in this unit (e.g., Authorization requests will be completed more quickly; Increase client satisfaction with our services) | **B. Measure(s)**  Instrument(s) / process(es) used to measure results (e.g., survey results, exam questions, etc.) | **C. Target(s)**  Level of success expected (e.g., 80% approval rating, 10-day faster request turn-around time, etc.) | | * Students will be able to apply principles of physics to analyze forces acting on stationary engineering structures and systems. | Two-unit exams containing questions on structural analysis of frames and machines composing 50% of each exam grade (ENGR 2301) | Min. 70% on each exam assessments by 70% of the students | | * Students will be able to analyze engineering structures and systems involving the motion of particles and rigid bodies | Unit exam on planar  motion analysis and kinetic equation of motion (ENGR 2302) | Min. 70% on exam assessment by 70% of the students | | * Students will be able to perform stress, strain and deformation analysis of engineering structures and systems. | Unit exam on calculation of stress and strain, and their transformation from one coordinate system to another (ENGR 2332) | Min. 70% on exam assessment by 70% of the students | | * Students will be able to create engineering drawings using industry software. | Final project to create engineering drawings with 2D and 3D views using advanced CADD (ENGR 1304) | Min. 70% on project assessment by 70% of the students |   Figure 5: CIP Plan for AY 2022-2023 |

**\*Please attach previous CIP Tables in the appendix**

**11. How will we evaluate our success?**

**NOTE: Please contact the institutional effectiveness office if you need assistance filling out the CIP tables.**

As part of the fifth year Program Review, the program should use the observations and data generated by this process along with data from other relevant assessment activities to develop the program’s CIP and an action plan for the next two years. At the conclusion of the first two years, data collected from the first year, plus any other relevant data that was collected in the interim, should be used to build on the accomplishments of those first two years by developing another two-year action plan for the CIP to help the program accomplish the expected outcomes established in its CIP or by implementing one of your other plans.

**Based on the information, analysis, and discussion that have been presented up to this point, summarize the strengths and weaknesses of this program. There should be no surprise issues here! This response should be based on information from prior sections of this document. Describe specific actions the faculty intends to take to capitalize on the strengths, mitigate the weaknesses, improve student success and program learning outcomes.** **Provide the rationale for the expected outcomes chosen for the CIP(s).**

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**12. Complete the Continuous Improvement Plan (CIP) tables that follow.**

Within the context of the information gleaned in this review process and any other relevant data, identify program priorities for the next two years, **including at least one program learning outcome (or program competency)**, and focus on these priorities to formulate your CIP. You may also add short-term administrative, technological, assessment, resource or professional development outcomes as needed.

|  |
| --- |
| As discussed in Section 11, current CIP targets were met or exceeded for the last two cycles. As a result, the faculty developed new metrics to isolate three of the most pivotal learning outcomes for the program. First, students must be able to apply principles of physics to analyze forces acting on stationary engineering structures and systems. This can be checked by examining whether students are (a) comfortable drawing a free-body diagram and (b) are proficient at using that diagram to develop sets of equations – at this stage in the program, that will be equations of equilibrium. These skills are of paramount importance for both the Civil Engineering and the Mechanical Engineering Fields-of-Study, and so will be shared between the programs.  Second, students will be able to compare hand calculations to numerical simulations of static analyses of a beam. To ensure this, professional communication and critical thinking will be examined through comparison of hand calculations and numerical simulations of basic static analysis. This will allow faculty to ascertain the level of professional communication students currently achieve in the program. If targets are not met here, faculty plan to add exercises targeting development of technical communication within the existing course framework. |

**Table 1. CIP Outcomes, Measures & Targets Table (focus on at least one for the next two years)**

|  |  |  |
| --- | --- | --- |
| **A. Expected Outcomes**  Results expected in this unit  (e.g. Authorization requests will be completed more quickly; Increase client satisfaction with our services) | **B. Measures**  Instrument(s)/process(es) used to measure results  (e.g. sign-in sheets, surveys, focus groups, etc.) | **C. Targets**  Level of success expected  (e.g. 80% approval rating, 10 day faster request turn-around time, etc.) |
| Students will be able to apply principles of physics to analyze forces acting on stationary engineering structures and systems. | An assignment requiring static analysis of a beam with correct (a) development of a free-body diagram and (b) application equations of equilibrium (ENGR 2301) | Min. 75% on the assessment by 80% of the students |
| Students will be able to compare hand calculations to numerical simulations of static analysis of a beam. | An assignment requiring comparison of hand calculations with numerical simulations using the software (MechaniCalc) (ENGR 2301) | Min. 75% on the assessment by 80% of the students |
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**Continuous Improvement Plan**

**Outcomes might not change from year to year. For example, if you have not met previous targets, you may wish to retain the same outcomes. *You must have at least one program learning outcome.* You may also add short-term administrative, technological, assessment, resource or professional development goals, as needed. Choose 1 to 2 outcomes from Table 1 above to focus on over the next two years.**

**A. Outcome(s)** -Results expected in this program (from column A on Table 1 above--e.g. Students will learn how to compare/contrast Conflict and Structural Functional theories; increase student retention in Nursing Program).

**B. Measure(s)** –Instrument(s)s/process(es) used to measure results (e.g. results of essay assignment, test item questions 6 & 7 from final exam, end of term retention rates, etc.).

**C. Target(s)** -Degree of success expected (e.g. 80% success rate, 25 graduates per year, increase retention by 2% etc.).

**D. Action Plan** -Implementation of the action plan will begin during the next academic year. Based on analysis, identify actions to be taken to accomplish outcome. What will you do?  
**E. Results Summary** - Summarize the information and data collected in year 1.  
**F. Findings** - Explain how the information and data has impacted the expected outcome and program success.   
**G. Implementation of Findings** – Describe how you have used or will use your findings and analysis of the data to make program improvements.

**Table 2. CIP Outcomes 1 & 2**

|  |  |
| --- | --- |
| 1. **Outcome #1** Students will be able to apply principles of physics to analyze forces acting on stationary engineering structures and systems. | |
| 1. **Measure (Outcome #1)**   An assignment requiring static analysis of a beam with correct (a) development of a free-body diagram and (b) application equations of equilibrium (ENGR 2301) | 1. **Target (Outcome #1)**   Min. 75% on the assignment by 80% of the students |
| 1. **Action Plan (Outcome #1)**   Faculty will create a grading rubric to be used for all sections of the course. This rubric will divide points to quantify skills associated with (a) drawing a free-body-diagram (e.g., clear vector representation of all forces, labels for all dimensions, etc.) and (b) correct application of equations of equilibrium. | |
| 1. **Results Summary (Outcome #1) TO BE FILLED OUT IN YEAR 2** | |
| 1. **Findings (Outcome #1) TO BE FILLED OUT IN YEAR 2** | |
| 1. **Implementation of Findings (Outcome #1) TO BE FILLED OUT IN YEAR 2** | |

**Table 2. CIP Outcomes 1 & 2 (continued)**

|  |  |
| --- | --- |
| 1. **Outcome #2** Students will be able to compare hand calculations to numerical simulations of static analysis of a beam. | |
| 1. **Measure (Outcome #2)**   An assignment requiring comparison of hand calculations with numerical simulations using the software (MechaniCalc) (ENGR 2301) | 1. **Target (Outcome #2)**   Min. 75% on the assignment by 80% of the students |
| 1. **Action Plan (Outcome #2)**   Faculty will create a grading rubric to be used for all sections of the course. This rubric will be focused on two key outcomes. First, the comparison between hand calculations simulations must be clearly expressed with a percent variation, to show that students are able to complete the required mathematical work and numerical simulation. Second, professional communication will be evaluated. This means that all written work must be neat and all sentences clear and written according to technical writing guidelines. | |
| 1. **Results Summary (Outcome #2) TO BE FILLED OUT IN YEAR 2** | |
| 1. **Findings (Outcome #2) TO BE FILLED OUT IN YEAR 2** | |
| 1. **Implementation of Findings (Outcome #2) TO BE FILLED OUT IN YEAR 2** | |

**What happens next? The Program Review Report Pathway**

1. **Following approval by the Steering Committee,**

* Program Review Reports will be evaluated by the Leadership Team;
* After Leadership Team review, the reports will be posted on the Intranet prior to fall semester;
* At any point prior to Intranet posting, reports may be sent back for additional development by the unit.

1. **Unit responses to the Program Review Steering Committee recommendations received before July 31st will be posted with the Program Review Report.**
2. **Leadership Team members will work with program supervisors to incorporate Program Review findings into planning and activity changes during the next five years.**

**Please make sure to go back and complete your Executive Summary at the start of the Review.**