

**UCC/UGC/ECCC**

Proposal for Course Change/**Reactivation**

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| **[ ]  FAST TRACK (Select if this will** **be a fast track item. Refer to**  [***Fast Track Policy***](http://www4.nau.edu/avpaa/UCCPolicy/Agenda_FastTrack_Consent.docx) **for eligibility)** |

# *If the changes included in this proposal are significant, attach copies of original and proposed syllabi in* [*approved university format*](http://www4.nau.edu/avpaa/UCCForms/syllabus.doc)*.*

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| 1. Course subject and number: | **EGR 486** | 2. Units: | **1-3** |

 [**See upper and lower division undergraduate course definitions**](http://www4.nau.edu/avpaa/UCCPolicy/Uplow.doc).

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| 3. College: | CEFNS | 4. Academic Unit: | Electrical Engineering & Computer Science, Mechanical Engineering and Civil Engineering, Construction Management and Environmental Engineering |

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| 5. Current Student Learning Outcomes of the course. | Show the proposed changes in this column (if applicable). Bold the proposed changes in this column to differentiate from what is not changing, and Bold with strikethrough what is being deleted. *(*[*Resources & Examples for Developing Course Learning Outcomes*](http://www4.nau.edu/avpaa/Assessment/CourseLearningOutcomesPDF_090712.pdf)*)***At the conclusion of the course it is expected that each student will be able to (ABET learning outcomes are in parenthesis):**1. **Execute the design process considering realistic constraints such as societal, technical, economic, and environmental impacts. (c)**
2. **Work effectively with other majors as a team of diverse individuals (d).**
3. **Communicate effectively in teams and in presentations (g).**
4. **Pursue individual learning and the resources necessary to complete a project. (i)**
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| 6. Current **title,** **description** and **units**. Cut and paste, in its entirety,from the current on-line academic catalog\* **EGR 486 ENGINEERING DESIGN (1-3)** Design methodology and decision making. Team design projects culminating with oral and written reports. Individual projects are appropriate on approval. 2 hrs. lecture, 3 hrs. lab. Prerequisite: Area-specific approval. | Show the proposed changes in this column **Bold** the proposed changes in this column to differentiate from what is not changing, and **~~Bold with strikethrough~~**what is being deleted.**EGR 486C ENGINEERING DESIGN II (~~1-~~3)****Description: Team design projects culminating with oral and written reports.  Letter grade only.  Course fee required.****Units: 3****Requirement Designation: Capstone****Prerequisite: EGR 476C with a grade of C or better.** |

\*if there has been a previously approved UCC/UGC/ECCC change since the last catalog year, please copy the approved text from the proposal form into this field.

 7. Justification for course change.

**EGR 476/486 is being reinstated as a multidisciplinary capstone experience. EGR 476/486 has not been offered in some years as the engineering departments have offered their own capstone classes (ME476C/486C, EE 476C/486C, CENE476/486C, and CS 476/486C). Our accrediting agency as well as the university has moved recently towards a more multi-disciplinary experience for students, and EGR 476C/486C will be offered in the future to reflect that change. The class will be offered to all engineering and computer science majors as a capstone substitute for their departmental capstone. The class will be open to all majors, depending on the projects, and depending on departmental approvals, may be substituted for a senior capstone requirement in other departments. This will enhance cross-disciplinary collaboration at NAU.**

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| 8. Effective **BEGINNING** of what term and year? | **Fall 2014** |
| [**See effective dates calendar**](http://www4.nau.edu/avpaa/timelines/1314Effective.xls). |  |

**IN THE FOLLOWING SECTION, COMPLETE ONLY WHAT IS CHANGING**

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| **CURRENT** | **PROPOSED** |
| Current course subject and number:EGR 486 | Proposed course subject and number:**EGR 486C** |
| Current number of units:1-3 | Proposed number of units:**3** |
| Current short course title:ENGINEERING DESIGN | Proposed short course title (max 30 characters):**ENGINEERING DESIGN II** |
| Current long course title:ENGINEERING DESIGN | Proposed long course title (max 100 characters): **ENGINEERING DESIGN II** |
| Current grading option:letter grade [ ]  pass/fail [ ]  or both [ ]  | Proposed grading option:letter grade [ ]  pass/fail [ ]  or both [ ]  |
| Current repeat for additional units: | Proposed repeat for additional units: |
| Current max number of units: | Proposed max number of units: |
| Current prerequisite:NONE  | Proposed prerequisite (include rationale in the justification):**EGR 476C with a grade of C or better.** |
| Current co-requisite: | Proposed co-requisite (include rationale in the justification):  |
| Current co-convene with: | Proposed co-convene with: |
| Current cross list with: | Proposed cross list with: |

9. Is this course in any plan (major, minor, or certificate) or sub plan (emphasis)? Yes [x]  No [ ]

 If yes, describe the impact. If applicable, include evidence of notification to and/or response

 from each impacted academic unit.

**Civil Engineering BSE, Electrical Engineering BSE, Environmental Engineering BSE, Mechanical Engineering BSE plan change proposals to add the course are being submitted concurrently.**

10. Is there a related plan or sub plan change proposal being submitted? Yes [x]  No [ ]

 If no, explain.

11. Does this course include combined lecture and lab components?                  Yes [ ]  No [x]

 If yes, include the units specific to each component in the course description above.

**Answer 12-15 for UCC/ECCC only:**

12. Is this course an approved Liberal Studies or Diversity course?                  Yes [x]  No [ ]         If yes, select all that apply.   Liberal Studies [x]    Diversity [ ]    Both [ ]

13. Do you want to remove the Liberal Studies or Diversity designation?            Yes [ ]  No [ ]

 If yes, select all that apply.   Liberal Studies [ ]    Diversity [ ]     Both [ ]

14. Is this course listed in the [**Course Equivalency Guide**](https://aztransmac2.asu.edu/cgi-bin/WebObjects/Admin_CEG.woa/wa/ByInst?inst=NAU)?                               Yes [ ]  No [x]

15. Is this course a [**Shared Unique Numbering**](https://aztransmac1.asu.edu/cgi-bin/WebObjects/ATASS.woa/wa/SUNList?S=X) (SUN) course?                            Yes [ ]  No [x]

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| **FLAGSTAFF MOUNTAIN CAMPUS** |  |
| **Scott Galland**  | **2/13/2014** |
| Reviewed by Curriculum Process Associate | Date |
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| **Approvals**: |  |
|  |  |
| Department Chair/Unit Head (if appropriate) | Date |
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| Chair of college curriculum committee | Date |
|  |  |
| Dean of college | Date |
|  |  |
| **For Committee use only:** |  |
|  |  |
| UCC/UGC Approval | Date |

Approved as submitted: Yes [ ]  No [ ]

Approved as modified: Yes [ ]  No [ ]

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| **EXTENDED CAMPUSES** |  |
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| Reviewed by Curriculum Process Associate | Date |
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| **Approvals:**  |  |
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| Academic Unit Head | Date |
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| Division Curriculum Committee (Yuma, Yavapai, or Personalized Learning) | Date |
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| Division Administrator in Extended Campuses (Yuma, Yavapai, or Personalized Learning) | Date |
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| Faculty Chair of Extended Campuses Curriculum Committee (Yuma, Yavapai, or Personalized Learning) | Date |
|  |
| Chief Academic Officer; Extended Campuses (or Designee) | Date |
|  |  |

Approved as submitted: Yes [ ]  No [ ]

Approved as modified: Yes [ ]  No [ ]

**PREVIOUS (1-3 UNIT) SYLLABUS - N/A; EGR 486 WAS INACTIVE SPRING 2000**

**PROPOSED (3 UNIT) SYLLABUS:**

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| NAU_PrimH_dep1 | College of Engineering, Forestry, and Natural SciencesEGR 486c – Engineering Design IISyllabus – Spring 2015 |

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| **Catalog Description** | EGR 486c - Engineering Design II (3 units). Team design projects culminating with oral and written reports.  Letter grade only.  Course fee required |
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| **Prerequisites** | EGR 476c |
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| **Section Information** | EGR 486c-1, M/W/F 9:10-10:00am |
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| **Instructor Information** | Bryan Cooperrider, Assistant Professor of Practice, Director of the Design4Practice ProgramOffice: Room 221; bryan.cooperrider@nau.eduOffice Hours: M/W 10:00am-noon, or by appointment  |
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| **Learning Outcomes** | At the conclusion of the course it is expected that each student will be able to (ABET learning outcomes are in parenthesis):1. Execute the design process considering realistic constraints such as societal, technical, economic, and environmental impacts. (c)
2. Work effectively with other majors as a team of diverse individuals (d).
3. Communicate effectively in teams and in presentations (g).
4. Pursue individual learning and the resources necessary to complete a project. (i)
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| **Textbook** | None; any readings will be provided on Bb Learn. |
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| **Course Outline** |

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| Week 1 | Introductions, Policies | **Important Dates**1/14 – classes begin1/21 – MLK holiday1/24 – last day to add/drop2/4 – administrative drop deadline3/8 – submission of mid-term grades3/15 – last day to drop with a “W”3/18 - 3/22 – Spring Break4/26 – last day to officially withdraw from the University5/3 – last day of classes5/6 - 5/9 – finals |
| Week 2 | Project Status meetings (PSM) |
| Week 3 | Prototype 1 due, PSM, peer eval 1 |
| Week 4 | Project Status Presentations (PSP) |
| Week 5 | PSP |
| Week 6 | PSM, peer eval 2 |
| Week 7 | Prototype 2 due, PSM |
| Week 8 | Scheduling |
| Week 9 | Team assessments |
| Week 10 | PSP, peer eval 3 |
| Week 11 | PSP |
| Week 12 | PSM |
| Week 13 | PSM |
| Week 14 | UGRADS presentations |
| Week 15 | Final projects, reports, peer evals due |
|  | Finals |

Note: weekly schedule is subject to change. |
| **Course Structure** | This course is a multidisciplinary capstone experience. Students may be from any major depending on the nature of the projects. This class is dedicated to pursuing and completing the projects proposed in EGR 476c. Much of the course will be dedicated to team meetings with instructors and clients, presentations, and individual work directed at Grades will be weighted by peer evaluations and based on a set of deliverable products listed below under Assessment. |
| **Assessment** | You will be evaluated on the learning objectives (listed above), according to the following weighting:

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| Assessment | Percentage |
| Project Status Meetings | 10% |
| Presentations | 10% |
| Prototypes | 5% |
| Technical Advisor meetings | 5% |
| Draft report | 20% |
| Final Report | 10% |
| Final Product | 30% |
| Logbook | 5% |
| Website | 5% |

**Project Status Meetings**Each team will provide project status updates to the instructor. These meetings will provide an overview of the current status of the project, and will address project progress with reference to original schedule and highlight activities completed in the weeks prior to the presentation. The course instructor will assess project progress, the extent that each team member is contributing to the technical work products, and also provide guidance and recommendations on various aspects of the team’s project work as necessary.**Technical Advisor Meetings**Each team is required to meet regularly during with their assigned technical adviser. A minimum of ten meetings with the technical advisor is required for each team, and it is envisioned that these meetings will require 30 – 60 minutes each. The primary intent of these meetings is to keep teams on track with their technical work and provide an opportunity for the advisor to assess team progress. Teams are expected to provide the advisor with a meeting agenda three days prior to the meeting and to take meeting notes to record decisions made, new tasks to be initiated prior to next meeting, etc. The advisor will evaluate whether the team:1. was adequately prepared for the meeting (e.g. agenda sent prior, list of questions prepared in advance, current analysis and design calculations organized so that the advisor can review as necessary, etc.)
2. has completed any tasks requested by the advisor in the previous meeting
3. is working well as a team with work efforts distributed equitably among team members

**Oral Presentations**The final oral presentation will be the culmination of your work in this course. Leading up to that final presentation, teams will present multiple times at various stages to practice presentation skills as well as advise peers and faculty of their progress.**Peer Evaluations**Individual grades will be impacted by regular peer evaluations. Peer evals are done four times. The first three will provide feedback to individuals in areas they are strong and weak performers. The last peer eval will be used to modify individual grades.**Prototypes**Each team will identify appropriate protoypes for their project. These may be working models, low-fidelity proof of concepts, or conceptual models. Teams will be required to identify appropriate prototype models and present them as proof of their concept.**Final Project** Each team will present their final project, whether it is a system or an object. The report and any manufactured objects will be graded for their completeness and functionality. This grade is separate from the presentation grade. |
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| **Grading System** | Final grades will be assigned using the following scale:

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| Letter Grade | Numeric Grade |
| A | 90 to 100 |
| B | 80 to 89 |
| C | 70 to 79 |
| D | 60 to 69 |
| F | 59 or below |

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| **Course Policies** | Professional engineers must abide by workplace policies, and similarly as an engineering student, you must abide by academic (<http://nau.edu/Student-Life/Student-Handbook/Academic-Policies/>) and course policies.**Attendance**There is a clear link between success and class attendance. By attending class, not only will you be learning from your peers, there is also important content delivered in class. If you must miss any class session, you are expected to deal with your absence professionally (only those with documented illnesses or university approved absences – will be allowed to make up any in-class assignments). Excessive absence, lack of preparedness, or late arrival, especially those that are not handled in a professional manner, will likely result in a lower course grade. **Use of Electronic Devices and Computers During Class**Any and all electronic devices are to be turned off and placed either in a backpack or purse. As such, all electronic devices are not allowed on desks or tables and are not to be used for any purpose during class. Such devices are disruptive and not conducive to learning. Laptop computers and tablet devices are to be used only to take class notes. They are not to be used for any activities unrelated to class (for example, checking emails or working on assignments). **Work*** ***All assignments must be neatly presented.***
* Any homework that is not professionally presented will be returned with a grade of zero.
* As a general rule, you are expected to work two hours outside of class for every hour in class. For a three unit class, this means that you can expect to work six hours a week outside of the classroom.

**Late Work*** ***Late homework and projects are not accepted unless there is a documented illness or a university approved absence.*** All assignments are due at the beginning of class and will be collected before any class activities begin.

**Plagiarism and Cheating*** You are expected to behave professionally during this course. This means that individual coursework will be completed individually. You are encouraged to discuss assignments, but you may not submit another’s work as your own.
* On all assignments, any sources of information that are not the original creation of the author must be cited in sufficient detail that the instructor can locate and verify the sources.
* If you are repeating this class, you may not use work that you completed for a previous class.

Plagiarism and cheating are subject to the Arizona Board of Regents Code of Conduct procedures as outlined in the NAU Student Handbook.  |
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| **University Policies** | Please review the following NAU Academic Policy Statements (<http://www4.nau.edu/avpaa/UCCPolicy/plcystmt.html>):* Safe Environment Policy
* Students With Disabilities
* Institutional Review Board
* Academic Integrity
* Academic Contact Hour Policy
* Sensitive Course Materials

NAU Classroom Disruption Policy: <http://nau.edu/uploadedFiles/Administrative/EMSA_Sites/Folder_Templates/_Forms/Classroom_Disruption_Policy.pdf> Revised Professional Code of Ethics statement: <http://nau.edu/uploadedFiles/Academic/CEFNS/Forms/engineering%20students%20professional.pdf>Student Handbook: <http://nau.edu/Student-Life/Student-Handbook/> |
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| **About the Design4Practice (D4P) Program** | The Design4Practice (D4P) Program consists of a sequence of design courses that span the freshman to senior years in all engineering degree programs at NAU. The D4P courses are designed to prepare students for an engineering corporate environment, which requires the synthesis of technical knowledge and skills as well as a proficiency in a variety of professional skills. The four “pillars” of the D4P Program are: 1) Engineering Design, 2) Communication, 3) Teamwork, 4) Professionalism. **D4P Courses:*** EGR 186 – Introduction to Engineering Design
* EGR 286 – Engineering Design: The Process; CENE – Civil And Environmental Engineering Design:  The Process
* EGR 386W – Engineering Design: The Methods
* Capstone courses: CENE 476 & 478C, EE 476C & 486C, ME 476C & 486C, EGR 476c & 486c

Additional information about the D4P program: <http://nau.edu/cefns/Engineering/D4P/>.  |