# UMBC UGC Instructions for New Course Request Form (revised 2/2015)

**Course number & title:** Enter the number and title of the course at the top of the page. Contact the Registrar's Office to confirm that the desired course number is available.

**Date submitted:** The date that the form will be submitted to the UGC.

**Effective date:** The semester the new course is in effect, if approved.

**Contact information:** Provide the contact information of the Chair or UPD of the department or program housing the course. If the course is not housed in a department or program, then provide the same information for the head of the appropriate academic unit. (See UGC Procedures) If another faculty member should also be contacted for questions about the request and be notified about UGC actions on the request, include that person's contact information on the second line.

**Course number:** For cross-listed courses, provide all the numbers for the new course.

**Transcript title:** Limited to 30 characters, including spaces.

**Recommended Course Preparation:** ***Please note that all 300 and 400 level courses should have either recommended course preparation(s) or prerequisite(s) and that 100 or 200 level courses may have them.***
Here fill in what previous course(s) a student should have taken to succeed in the course. These recommendations will NOT be enforced by the registration system. Please explain your choices in the "rationale" (discussed below).

**Prerequisite:** ***Please note that all 300 and 400 level courses should have either recommended course preparation(s) or prerequisite(s)*** Here fill in course(s) students need to have taken before they enroll in this course. These prerequisites will be enforced through the registration system. Please explain your choices in the "rationale" (discussed below).

**NOTE:** Please use the words "AND" and "OR", along with parentheses as appropriate, in the lists of prerequisites and recommended preparation so that the requirements specified will be interpreted unambiguously.

**NOTE:** Unless otherwise indicated, a prerequisite is assumed to be passed with a "D" or better.

**Maximum total credits:** This should be equal to the number of credits for courses that cannot be repeated for credit. For courses that may be repeated for credit, enter the maximum total number of credits a student can receive from this course. E.g., enter 6 credits for a 3 credit course that may be taken a second time for credit, but not for a third time. Please note that this does NOT refer to how many times a class may be retaken for a higher grade.

**Grading method(s):** Check all that apply.

**Proposed catalog description:** Provide the exact wording of the course description as it will appear in the next undergraduate catalog. Course proposals should be a) no longer than 75 words, b) stated in declarative sentences in language accessible to students, and c) avoid reference to specific details that may not always pertain (e.g., dates, events, etc.). Course descriptions should not repeat information about prerequisites (which are always listed alongside the course description)."

**Rationale:** Please explain the following:
a) Why is there a need for this course at this time?
b) How often is the course likely to be taught?
c) How does this course fit into your department's curriculum?
d) What primary student population will the course serve?
e) Why is the course offered at the level (ie. 100, 200, 300, or 400 level) chosen?
f) Explain the appropriateness of the recommended course preparation(s) and prerequisite(s).
g) Explain the reasoning behind the P/F or regular grading method.
h) Provide a justification for the repeatability of the course.

**Cross-listed courses:** Requests to create cross-listed courses must be accompanied by letters of support via email from all involved department chairs. Proposals for new courses or the addition of a cross-listing to an existing course must include as a part of the rationale the specific reason why cross-listing is appropriate. Email from all involved department chairs is also required when cross-listing is removed and when a cross-listed course is discontinued. Please note that Special
Topics courses cannot be cross-listed.

**Course Outline:** Provide a syllabus with main topics and a weekly assignment schedule which includes complete citations for readings with page numbers as appropriate. Explain how students' knowledge and skills will be assessed.

*Note: the UGC form is a Microsoft Word form. You should be able to enter most of the information by tabbing through the fields. The document is protected. In the rare case that you need to unprotect the document, use the password 'ugcform'. Beware that you will lose all the data entered in the form's fields if you unlock and lock the document.*

**UMBC UGC New Course Request:** ENME 491 Global Engineering

Date Submitted: 11/29/2016 Proposed Effective Date: 1/1/2017

| | Name | Email | Phone | Dept |
|---|---|---|---|---|
| Dept Chair or UPD | Chuck Eggleton | eggleton@umbc.edu | 53313 | MechEngr |
| Other Contact | Marc Zupan | mzupan@umbc.edu | 56822 | MechEngr |

**COURSE INFORMATION:**

| | |
|---|---|
| Course Number(s) | ENME 491 |
| Formal Title | Global Engineering |
| Transcript Title (≤30c) | Global Engineering |
| Recommended Course Preparation | |
| Prerequisite **NOTE:** Unless otherwise indicated, a prerequisite is assumed to be passed with a "D" or better. | ENME301 |
| Credits | 3 |
| Repeatable? | ☐ Yes ☒ No |
| Max. Total Credits | This should be equal to the number of credits for courses that cannot be repeated for credit. For courses that may be repeated for credit, enter the maximum total number of credits a student can receive from this course. E.g., enter 6 credits for a 3 credit course that may be taken a second time for credit, but not for a third time. Please note that this does NOT refer to how many times a class may be retaken for a higher grade. |
| Grading Method(s) | ☒ Reg (A-F) ☐ Audit ☐ Pass-Fail |

**PROPOSED CATALOG DESCRIPTION (**no longer than 75 words**):**

An interdisciplinary course of study intersecting engineering technology, entrepreneurship and the influence of the global society/culture on problem solving. The course directly develops student skills to operate and work as an engineer at the global interface. This course uses explicit technological examples and presents how different engineering cultures use a dissimilar solution path to meet the engineering objective.

**RATIONALE FOR NEW COURSE:**

More than ever before, engineering is a global endeavor. Next generation engineers must have skills to work in globally dispersed heterogeneous teams operating in different physical locations possibly in different time zones and with cultural perspectives. This program not only addresses the educational component of training engineers with much needed global skills it addresses the pragmatic hurdles that not all students have the fiscal or time means to spend time abroad.

A New Course, Engineering at the Global Interface: In collaboration with colleagues at FEUP- Faculdade de Engenharia da Universidade do Porto we have created a new course and accompanying rubrics to specifically test target competences in the student cohorts. A "mixed methods" approach combines "defining" and "enabling" assignments, as advocated by the American Council on Education, yet the focus remains on *applied* competence. The literature now frames global engineering competences which include but are not limited to the following

**Table 1: Attributes of Global Engineers**

| | |
|---|---|
| 1) | Are proficient working in or directing a team of ethnic or cultural diversity |
| 2) | Are able to communicate across cultures |
| 3) | Understand cultural differences relating to product design, manufacture, and use |
| 4) | Have an understanding of the connectedness of the world and the workings of the global economy |
| 5) | Understand implications of cultural differences on how engineering tasks might be approached |
| 6) | Can effectively deal with ethical issues arising from cultural or national differences. |
| 7) | Can appreciate other cultures |
| 8) | Have some exposure to international aspects of topics such as supply chain management, intellectual property, liability and risk, and business practices |
| 9) | Have a chance to practice engineering in a global context |
| 10) | View themselves as 'citizens of the world,' as well as citizens of a particular country, and appreciate challenges facing mankind |

The target of this work is to establish an elective course, within the traditional engineering sequence, which develops and evaluates these global engineering competencies in students. As such engineering students can gain certain global engineering competencies in a system that is both fee and time neutral to their academic career.

The course, 'Engineering at the Global Interface", not only expands students' repertoire of experimental and design skills, but also encourages the type of self-reflexivity that a trans-cultural experience affords (by taking students out of their comfort zones and forcing them to reflect on the *best* course of action, not merely the routine). Learning to acclimate to different cultures and engineering practices will help students adapt to different corporate cultures, in the U.S. or beyond, in the professional sphere.

Course Overview: Global Engineering, co-offered between UMBC- University of Maryland Baltimore County and FEUP-Faculdade de Engenharia da Universidade do Porto establishes an interdisciplinary course of study intersecting engineering technology, entrepreneurship skills and the influence of the global society/culture on problem solving. As delivered it is a contiguous delivery of the course materials (3 credit hour course within the American semester system). The multi- university course directly develops student skills to operate and work as an engineer at the global interface. This course uses explicit technological examples and presents how different engineering cultures use a dissimilar solution path to meet the engineering objective (both the path and final solution have differences). Topics address how engineering is practiced globally and differences in engineering around the world, how to conduct oneself in a foreign environment, cultural issues and preparing for an international educational experience. The defining engineering concepts, similarities and differences are contrasted and identified. Students work in multi-cultural and multi-level teams to solve engineering tasks giving them direct experience working in a global team. This course establishes an interdisciplinary study of engineering technology and the influence of the global society and culture on problem solving. Best practices, rules, tools and evaluation schemes are discussed within the context of the available literature. This multi- university, multi-national course directly develops skills to operate and work as an engineer at the global interface developing a new pipeline of skilled engineering graduates.

The course utilizes a transparent teaching style. This involves giving students explicit guidelines and directives – clearly defining terms and expectations, making deliverables absolutely clear and explaining how they are evaluated. Yet it also involves discussing with students why they are learning and executing certain procedures and how these translate to real-world engineering pursuits.

The course uses a pedagogy that is practical, informative, and self-reflective.
*Practical*: students are assigned to write peer reviews for their counterparts (in order to gain familiarity with this genre on an international front) and simulate the process of defining equipment needs and purchasing material from a foreign country.
*Informative*: Students are encouraged to design ideas, research techniques, and delivery methods from different engineering cultures.
*Self-Reflective/Meta-Reflective:* Students openly discuss how to adapt to the challenges of creating integrative solutions in a different country, language, culture, and infrastructure**.** With Dr. Zupan as their instructor, the Portuguese students can share how they adapt to the teaching style of an American professor, to education in a foreign language, and to the experience of collaborating with student-partners from a different country. Essentially, Zupan serves – self-reflexively – as a model for his students in navigating the challenges, struggles and triumphs of international partnership in engineering research and education.

This foundational course is designed to be transparent about the unique obstacles and unparalleled advantages of global engineering. With this open pedagogical approach, students have the experience of jointly working with peers from a different culture of engineering, but also have an open forum for discussing the dynamics of such cooperative work. In so doing, students can cultivate cultural awareness and strategic problem-solving skills and learn to open communication paths that are crucial for the teamwork necessary for success in any engineering profession.

**ATTACH COURSE OUTLINE (mandatory):**
See attached 2016_GE Syllabus_English