GEORGE MASON UNIVERSITY

Course Approval Form

Action Requested: (definitions available at website above)

[X] Create NEW   [ ] Inactivate

[ ] Modify (check all that apply below)

Course Level:

[X] Undergraduate   [ ] Graduate

[ ] Title	[ ] Repeat Status	[ ] Prereq/coreq	[ ] Grade Mode
[ ] Credits	[ ] Schedule Type	[ ] Restrictions	[ ] Other: _____

College/School: College of Science   **Department:** COS

Submitted by: Padmanabhan Seshaiyer   **Ext:** 9787   **Email:** pseshaiy@gmu.edu

Subject Code: COS   **Number:** 400   **Effective Term:** [ ] Fall   [ ] Spring   *Year* 2018   [x] Summer

(Do not list multiple codes or numbers. Each course proposal must have a separate form.)

Title:
Current [_____]
Banner (30 characters max w/ spaces) [Problem Solving Leadership: STEAM]
New [Problem Solving and Leadership inSTEAM]

Fulfills Mason Core Req? (undergrad only)

[ ] Currently fulfills requirement

[x] Submission in progress

Credits: (check one)
[x] Fixed → 3
[ ] Variable → ___ to ___
[ ] Lec + Lab/Rct→ 0 or ___

Repeat Status: (check one)
[x] Not Repeatable (NR)
[ ] Repeatable within degree (RD) →
[ ] Repeatable within term (RT) →

Max credits allowed: [___]
(required for RT/RD status only)

Grade Mode: (check one)
[x] Regular (A, B, C, etc.)
[ ] Satisfactory/No Credit
[ ] Special (A, B C, etc. +IP)

Schedule Type: (check one)
LEC can include LAB or RCT if linked sections will be offered

[x] Lecture (LEC)
[ ] Lab (LAB)
[ ] Recitation (RCT)
[ ] Internship (INT)

[ ] Independent Study (IND)
[ ] Seminar (SEM)
[ ] Studio (STU)
[ ] Activity (ACT)

[ ] Research (RSC)
[ ] Student Teaching (STC)
[ ] Thesis (THS-798/799)
[ ] Dissertation (DIS-998/999)

Prerequisite(s) (NOTE: hard-coding requires separate Prereq Checking form; see above website):

[_____]

Corequisite(s):

[_____]

Restrictions Enforced by System: Major, College, Degree, Program, etc. Include Code(s).

[_____]

Equivalencies (check only as applicable):

[ ] YES, course is 100% equivalent to _____
[ ] YES, course renumbered to or replaces _____

Catalog Copy (Consult University Catalog for models)

Description (No more than 60 words, use verb phrases and present tense)	**Notes** (List additional information for the course)
In this course, participants will experience a hands-on approach to incorporating global problem solving principles into the STEAM (Science, Technology, Engineering, Arts and Mathematics) disciplines and consider implications for application in research and development. This course consists of face to face meetings, follow up webinars and a collaborative project.	This course will culminate with international travel, locations will vary by semester.

Indicate number of contact hours: Hours of Lecture or Seminar per week: [___]   Hours of Lab or Studio: [___]

When Offered: (check all that apply)   [ ] Fall   [ ] Summer   [ ] Spring

Approval Signatures

_____   _____
Department Approval   Date   College/School Approval   Date

If this course includes subject matter currently dealt with by any other units, the originating department must circulate this proposal for review by those units and obtain the necessary signatures prior to submission. Failure to do so will delay action on this proposal.

Unit Name	Unit Approval Name	Unit Approver's Signature	Date

Undergraduate or Graduate Council Approval

_____   _____   _____
UGC or GC Council Member   Provost's Office   UGC or GC Approval Date

Form revised 11/10/2016

Course Proposal Submitted to the College of Science Curriculum Committee (COSCC)

The form above is processed by the Office of the University Registrar. This second page is for the COSCC's reference. Please complete the applicable portions of this page to clearly communicate what the form above is requesting.

FOR ALL COURSES (required)
Course Number and Title:
COS 400 Problem Solving and Leadership inSTEAM

Date of Departmental Approval:

FOR INACTIVATED/REINSTATED COURSES (required if inactivating/reinstating a course)
- Reason for Inactivating/Reinstating:

FOR MODIFIED COURSES (required if modifying a course)
- Summary of the Modification:

- Text before Modification (title, repeat status, catalog description, etc.):

- Text after Modification (title, repeat status, catalog description, etc.):

- Reason for the Modification:

FOR NEW COURSES (required if creating a new course)
- Reason for the New Course:
  COS is looking to expand its global presence, this course will help toward accomplishing that goal and will give students a great resume building experience.

- Relationship to Existing Programs:

  The course can be used in various undergraduate programs across the university. For undergraduate students, our goal is to obtain the Mason Core: Global Understanding attribute

- Relationship to Existing Courses:
  Has been offered under the UNIV prefix in the past. A graduate version of this course will also be created and the courses will be likely crosslisted each semester they are offered.

- Semester of Initial Offering: Summer 2018

- Proposed Instructors: Padmanabhan Seshaiyer

- Insert Tentative Syllabus Below

COS 400/600: Problem Solving and Leadership in STEAM
(Science, Technology, Engineering, Arts and Mathematics)

Course Details:
Course Meeting Dates/Times: Summer 2018
Webinar Dates/Time: (TBD)

DESCRIPTION
In this program, participants will experience a hands-on approach to incorporating global problem solving principles into the STEAM (Science, Technology, Engineering, Arts and Mathematics) disciplines and consider implications for application in research and development.This program consists of face-to-face meetings, follow-up webinars and a collaborative project. Material for the course will be provided by the instructors. COS 600 will require graduate-level assignments and students will be graded using the graduate scale.

OBJECTIVE OF THE COURSE
The goals of the course development will include:
1. Enhancing 21st Century Skills (Communication, Collaboration, Critical Thinking and Creativity) for solving scientific problems
2. Incorporating problem solving frameworks such as design thinking, learning by doing, active, experiential and project-based learning to solve global challenges that impact the society
3. Learning how to work in collaborative teams to build innovative products and STEAM-based solutions
4. Broaden student learning about models of practice in ethics and leadership in problem solving.
5. Learning processes and frameworks about entrepreneurship and managing a new enterprise.

This program is dependent on both class discussion and activities to meet the objectives. Successful completion of the course requires regular attendance, participation, and punctual completion of assigned course activities. These will include:

A. Class Participation and Classwork: Class sessions will consist of engaging in problem solving activities, data collection and analysis. All work will be collected.

B. Design e-Journal: At the beginning of the first class, you will begin an e-Journal. Please use this Journal throughout the semester to record your insights from the course, your observations

and insights on the course project, and any other creative insights you have throughout the semester on any topic. The e-Journal will be a personal record of your creative activity throughout the semester.

C. Homework: Each class the students will be given homework assignments related to in-class activities which they will be expected to upload via the course site.

D. Course Group Project

A course-long team project will form the backbone of the course experience. The class will be broken up into teams of 4-5 students, and each group will select a global design challenge which they will work on for the duration of the course. The group project will focus on a process used to describe a way of thinking and a set of key outputs and deliverables associated with creative concept exploration and development. To do this, students will talk to real users; observe people in their native environments; think about real physical, technical, and social constraints; and understand real market pressures. The purpose is to give you experience working in a variety of diverse, creative teams. Diverse backgrounds and divergent thinking skills promote creativity. The Group Project will include the following components: (a) Discovery Phase Presentation and Document; (b) Design Phase Presentation and Document and; (c) Delivery Phase Presentation and Document   .

E. Final Presentation

A final presentation will be the key deliverable for this course. In each session, students will learn different tools and ways of thinking that advance project work on their design challenge and build toward the final presentation. Although each group's presentation content and form will be different from one another, the design thinking approach for each project will need to be clearly articulated. Highlights of the presentation include:
● 	Statement of the design challenge
● 	Actionable insights based on the design research conducted
● 	Key themes and opportunity areas identified from the insights
● 	Visualized concepts that address the opportunity areas
● 	A compelling, human-centered narrative that ties all the points above together.

E. Examinations
There will be one mid-semester exam and one comprehensive final exam in this course where the students will be tested on their conceptual understanding of the scientific content learnt in-class.

Grading and Course Requirements

Evaluation for the course will be based on the following criteria:

Homework Assignments	**40%**
Mid-semester exam	**10%**
Final exam	**15%**
Group Project	**30%**
In-class participation	**5%**

General Course Policies (Including Sample language for Policies on Electronic Devices)
Regarding electronic devices (such as laptops, cell phones, etc.), please be respectful of your peers and your instructor and do not engage in activities that are unrelated to class. Such disruptions show a lack of professionalism and may affect your participation grade.

University Requirements:
The integrity of the University community is affected by the individual choices made by each of us. Mason has an Honor Code with clear guidelines regarding academic integrity. Three fundamental and rather simple principles to follow at all times are that: (1) all work submitted be your own; (2) when using the work or ideas of others, including fellow students, give full credit through accurate citations; and (3) if you are uncertain about the ground rules on a particular assignment, ask for clarification. No grade is important enough to justify academic misconduct. Plagiarism means using the exact words, opinions, or factual information from another person without giving the person credit. Writers give credit through accepted documentation styles, such as parenthetical citation, footnotes, or endnotes. Paraphrased material must also be cited, using MLA or APA format. A simple listing of books or articles is not sufficient. Plagiarism is the equivalent of intellectual robbery and cannot be tolerated in the academic setting. If you have any doubts about what constitutes plagiarism, please see me.

Disability Accommodations
If you are a student with a disability and you need academic accommodations, please see me and contact Disability Services at 993-2474, http://ds.gmu.edu. All academic accommodations must be arranged through Disability Services.

Diversity and Inclusion
Diversity and inclusion are part of Mason's core values; they will be exercised in this course.

Sexual Harassment, Sexual Misconduct, and Interpersonal Violence
As a faculty member and designated "Responsible Employee," I am required to report all disclosures of sexual assault, interpersonal violence, and stalking to Mason's Title IX Coordinator per university policy 1412. If you wish to speak with someone confidentially, please contact the Student Support and Advocacy Center (703-380-1434), Counseling and Psychological Services (703-993-2380), Student Health Services, or Mason's Title IX Coordinator (703-993-8730; cde@gmu.edu).

Privacy
Students must use their MasonLive email account to receive important University information, including communications related to this class. I will not respond to messages sent from or send messages to a non-Mason email address.

Course Schedule
Below is a five week proposed schedule for the course activities.

Theme	Sessions	Activities
Discovery Phase: Insights Generation	Week 1	* Pre-Assessment *Global Multidisciplinary Problem Solving - I *****Hands-on Challenge * Strategies for innovation and entrepreneurship I

		* Building and Designing a website * Ethics and Leadership 1 * Assignment 1
Fast prototyping	Week 2	* Global Multidisciplinary Problem Solving - II * Learning by Doing * Research Plan Outline * Writing and Communication * Ethics and Leadership 2 * Assignment 2
Design Phase: Concept Generation	Week 3	* Global Multidisciplinary Problem Solving -III * Strategies for innovation and entrepreneurship II * Project Ideas and Concept Generation *Reflect on Innovation * Ethics and Leadership 3 * Assignment 3 *Mid-semester Exam
Delivery Phase: Concept Definition	Week 4	* Strategies for innovation and entrepreneurship III * Design Thinking in STEAM * Prototype creation * Problems and solutions / brainstorming * Assignment 4
	Session 5	* Work on final projects *Final Presentation *Lessons learned (group discussion) *Final Exam