

Divergent Thinking

EGS 6101 Section 13242

EGS 4100 Section 13197

Class Periods: Wednesdays, Periods 9-11, 4:05-7:05 pm

Location: Online and WERT 370

Academic Term: Spring 2023

Instructor:

Tina Mullen

Email Address: cmullen@arts.ufl.edu

Office Hours: by appointment

Teaching Assistant/Peer Mentor/Supervised Teaching Student:

- None

Course Description

Through hands on collaborative experiences, students will explore divergent thinking skills to support the engineering design process. The course emphasizes the importance of practices such as observing, questioning, interpreting, and elaboration, and helps students cultivate an openness to new experiences in order to generate ideas and devise solutions to complex design problems.

Each individual carries a unique capacity for creativity, and the highest levels of creativity require both divergent and convergent thinking. Divergent thinking encourages the generation of numerous solutions whereas convergent thinking promotes the use of information and a set of rules to arrive at a single 'correct' solution to a problem. While the former can be highly unstructured and unguided in nature, the latter is typically structured and directed. According to the well-known Geneplore Model, creativity involves a cyclical process of generating ideas and then systematically exploring the most promising ideas for implementation. The traditional engineering curriculum and pedagogy rely and place an emphasis on the development of convergent thinking skills of students for the delivery of discipline-specific domain knowledge. This course will focus on the generation and exploration phases of problem solving.

Engineering has directed and fueled the advance of civilization from Stone Age to Renaissance to Industrial Revolution to Digital Revolution. The century ahead poses challenges as difficult as any humanity has encountered to date. The problems of the future require engineering solutions that are large and complex necessitating a need for the innovative use of discipline-specific knowledge in inter-, multi-, trans-, and cross-disciplinary contexts. This, in turn, challenges the traditional engineering curriculum and pedagogy.

Students who want to think broadly, desire to cast a wider net, and have an interest in developing their potential for, and understanding their own creativity are encouraged to register.

Credit Hours: 3

Course Pre-Requisites / Co-Requisites

Junior/Senior standing

Course Objectives

This course develops student's divergent thinking abilities to develop creative solutions to challenging engineering problems. By the end of this course, the students are expected to: (1) interpret different forms of intelligence; (2) identify their own thinking and learning processes; (3) demonstrate a set of skills that allows them to discuss topics, generate ideas, and devise solutions from multiple perspectives; and (4) exercise divergent thinking skills with intent and work in interdisciplinary teams to conceptualize and develop solutions to design problems.

Materials and Supply Fees

\$20 ticket purchase for Dance performance at UFPA

Professional Component (ABET): This course is not applicable to ABET

Relation to Program Outcomes (ABET): N/A

Required Textbooks and Software

- A sketchbook (No smaller than is 9”X11” in size with blank pages. No grid or ruled paper.).

Course Schedule

This is a tentative outline and the instructor reserves the right to make changes as necessary.

| Week | Date | Activity | Due |
|------|----------|---|--|
| 1 | Jan 11 | Introduction Are you creative? | Reflection 1 |
| 2 | Jan 18 | Who are we? And Focused Attention | Reflection 2 A1: Observing |
| 3 | Jan 25 | The power of storytelling Guest Performer | Reflection 3 Mini Challenge 1 |
| 4 | Feb 1 | STOMP performance in lieu of class Friday Feb 3 @ 7:30pm | Reflection 4 |
| 5 | Feb 8 | Draw Toast Finding value in the obvious | Reflection 5 Mini Challenge 2 |
| 6 | Feb 15 | Perspective and Procrastination | Reflection 6 |
| 7 | Feb 22 | Empathy Do engineers need this? Guest speaker | Reflection 7 A3: Empathize |
| 8 | March 1 | Exploring Divergent Thinkers – Hack the Harn | Reflection 8 |
| 9 | March 8 | Decisive Moments /Teach Me | A4: Decisive Moment |
| 10 | March 15 | Break | |
| 11 | March 22 | Decisive Moments/Questioning and Visual Thinking | Reflection 9 A2: So Many Questions |
| 12 | March 29 | Questioning Crit | Reflection 10 |
| 13 | April 5 | Other people's shoes. Guest Artist | Reflection 11 Mini Challenge 3 |
| 14 | April 12 | Design Thinking Final Challenge | Reflection 12 |
| 15 | April 19 | Design Thinking Phase 2 Final Challenge | |
| 16 | April 26 | Wrap it Up Final Challenge | |

Attendance Policy, Class Expectations, and Make-Up Policy

This class is highly experiential and requires each student to come prepared to participate actively. Attendance will be taken. Given the nature of the course, it is virtually impossible to make up for the activities and challenges completed during sessions. Please plan accordingly.

- There will be a 5-minute grace period for late arrivals. If you arrive more than 15 minutes late, you will be counted as absent for the day.
- Leaving early is equivalent to a tardy.
- Two tardies equal one unexcused absence.
- Each unexcused absence will result in a 2-point deduction in your final grade.
- Each unexcused tardy will result in a 1-point deduction in your final grade.
- Excused absences must be consistent with university policies in the graduate catalog and require appropriate documentation (<http://gradcatalog.ufl.edu/content.php?catoid=10&navoid=2020#attendance>).
- Excused absences (those that can be documented) will be made up by an approved event attendance or a written assignment.
- Students are still responsible for material covered during their absence. In-class work missed for absences covered under UF attendance policies can be made up by alternative activities/assignments approved by the instructor

Evaluation of Grades

Your final grade for the class will be calculated as follows:

| Item | Percentage of Grade |
|------------------------|---------------------|
| Reflections portfolio | 15% |
| Assignments | 22% |
| Mini Challenges | 25% |
| Final Design Challenge | 18% |
| Expanded Activities | 20% |
| | |

Expand Activities: You will be asked to engage in activities outside of class. specific to the performance.

1. You will be asked to pair up with another person in the classroom and teach him/her something that you enjoy doing, and do well, that they have never tried. You will create together a visual presentation reflecting on your experience.
2. Hack the Harn – you will be asked to explore the Harn Museum and provide solutions to various questions posed on Canvas.
3. Dance Performance – you will attend STOMP on Friday, February 3, 2023 at 7:30 pm at the Phillips Center for the Performing Arts. You will compose a reflection based on the dance.

Reflections Portfolio: Each week, you will submit a journal entry in your sketchbook. The journal entries are your thoughts regarding the class process you've experienced, and ideas or impressions it has provoked. The journal pages will be uploaded to Canvas.

Assignments: A total of up to 4 Assignments will be given throughout the semester. No late assignments will be accepted. Details will be posted on Canvas.

Mini Challenges: A total of up to 4 Mini Challenges will be give throughout the semester. You will be working in teams or individually under a time constraint (45- or 60-min) during the class period. The class will end with a review of outcomes and reflections on the process. Details will be announced in class.

Final Design Challenge: We will work on a design challenge during the final three weeks of the semester. The class will be divided into design teams, and each team will present their proposal. These presentations are your final exam for the course.

Grading Policy

Final grade averages will be rounded off to the nearest integer, and assigned on the standard scale as follows:

| Percent | Grade | Grade Points |
|----------------|--------------|---------------------|
| 93 - 100 | A | 4.00 |
| 90 - 92 | A- | 3.67 |
| 87 - 89 | B+ | 3.33 |
| 83 - 86 | B | 3.00 |
| 80 - 82 | B- | 2.67 |
| 77 - 79 | C+ | 2.33 |
| 73 - 76 | C | 2.00 |
| 70 - 72 | C- | 1.67 |
| 67 - 69 | D+ | 1.33 |
| 63 - 66 | D | 1.00 |
| 60 - 62 | D- | 0.67 |
| 0 - 59 | E | 0.00 |

More information on UF grading policy may be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

Students Requiring Accommodations

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, <https://www.dso.ufl.edu/drc>) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Course Evaluation

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

University Honesty Policy

UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (<https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Commitment to a Safe and Inclusive Learning Environment

The Herbert Wertheim College of Engineering values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture.

Divergent Thinking is a combined lecture, discussion and experiential course. This means that, in part, all students are responsible for participating in their own and one another's learning through open dialogue. Because each student's contributions of questions and answers are essential, any behavior or language that makes others feel unsafe or unwelcome in this classroom can and will not be tolerated. Examples range from simply interrupting or ignoring others while they are talking to overt harassment or intimidation with reference to race, gender identity, sexual identity, religion, ethnicity, nationality, or ability.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:

- Your academic advisor or Graduate Program Coordinator
- Robin Bielling, Director of Human Resources, 352-392-0903, rbielling@eng.ufl.edu
- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.ufl.edu
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@eng.ufl.edu

Software Use

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: <https://registrar.ufl.edu/ferpa.html>

Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

Campus Resources:

Health and Wellness

U Matter, We Care:

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Counseling and Wellness Center: <http://www.counseling.ufl.edu/cwc>, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Discrimination, Harassment, Assault, or Violence

If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the [Office of Title IX Compliance](#), located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu

Sexual Assault Recovery Services (SARS)

Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or <http://www.police.ufl.edu/>.

Academic Resources

E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu.
<https://lss.at.ufl.edu/help.shtml>.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. <https://www.crc.ufl.edu/>.

Library Support, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring.
<https://teachingcenter.ufl.edu/>.

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers.
<https://writing.ufl.edu/writing-studio/>.

Student Complaints Campus: https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf.

On-Line Students Complaints: <http://www.distance.ufl.edu/student-complaint-process>.