1. **Course Title**- Vertically Integrated Projects - Intermediate **(**ENGR 3211)

2. **Catalog Description**- Students work in vertically integrated projects (VIP) teams on interdisciplinary faculty-lead research. VIP team members range from freshmen through graduate students, from first-time participants to students who have been involved for three or more semesters. Individual members work on different aspects of the research project. It is expected that students will enroll in progressive VIP courses for three consecutive semesters and participate at the appropriate level of experience to earn 3.0 hours of credit. This course is intended for intermediate team members or students who have working knowledge of the project topic.

3. **Required Texts and Other materials**-
    *   *The Indispensable Guide to Undergraduate Research: Success in and Beyond College* by Anne H. Charity Hudley, Cheryl L. Dickter, Hannah A. Franz, 1st Edition 2017 (ISBN: 9780807758502)

4. **Prerequisites**- There is no pre-requisite.

5. **Course Learning Outcomes/Objectives**-
    1. Develop and demonstrate independent research skills appropriate to the level of experience
    2. Develop and demonstrate mentoring skills appropriate to the level of experience
    3. Understand and accept the role of a senior team member to promote an inclusive work
        1. environment for members with diverse backgrounds, expertise, and experiences.
    4. Develop and demonstrate leadership skills appropriate to the level of experience
    5. Develop and employ teamwork skills appropriate to the level of experience

6. **Nature of Students to be Served**- Undergraduate level engineering students.

7. **Description of Course Methods**- The course will be taught through classroom lecture and/or workshops during a 3-hour timeslot to prepare and enable students to participate in one of two interdisciplinary research projects specified by the instructors. Each instructor will provide a project description based on their research and will form a VIP team based on enrolled student interest. VIP teams are faculty led and each faculty will add their own specific project details and research goals to set course expectations for the student outcomes. <u>There will be an online application and the faculty member leading the VIP-team for their project will admit and permit students in their course section.</u>

8. **Tentative Schedule-** The syllabus content is only intended to provide a solid foundation and framework in developing and applying research and mentoring skills, but the bulk of the work the students are expected to do is research as part of their VIP team.
    2.
    Students work on research project tasks and report on their work during weekly subteam meetings.
    Students participate in workshops on entrepreneurship and innovation; industry presentation
    Students participate in Workshop on mentoring
    3.

9. **Course Methodology Grading Policy**-

The grade is based on three areas, along with three requirements. Although each student may work on different areas and contribute differently, they must show achievements in all three areas below. Students will be given a letter grade based on the following:

1. **Documentation and records (34%)**
   a. Maintain a Design Notebook
   b. Wiki/blog documentation if used by team
   c. Code (via GitHub) if used by team
2. **Personal accomplishments and contributions to your team's goals (33%)**
   a. Participation in VIP workshops and seminars;
   b. Quizzes, learning modules, essays, reports required by your adviser(s);
   c. Engagement in project;
   d. Pursuit of knowledge necessary for project;
   e. Contributions to the technical progress of the team;
   f. For more experienced members of the team, contributions to the management of the project may be expected.
3. **Teamwork and interaction (33%)**
   a. On-time attendance in meetings
   b. Actively contributing to overall team goals
   c. Coordinating activities with other team members
   d. Assisting other team members
   e. Team Presentation(s)
   f. Peer Evaluations
4. As part of the assessment of the above, each student is required to:
   a. Maintain a Design Notebook. Example notebooks are available at: https://vip.gatech.edu/vip-notebooks
   b. Complete the mid-term peer evaluation. This is a web-based form, and links are available at http://www.memphis.edu/vip. Failure to complete the peer evaluation will result in a full letter grade deduction. Late submissions will not be accepted.
   c. Complete the final peer evaluation, which will be available for one week at the end of the semester. Failure to complete the peer evaluation will result in a full letter grade deduction. Late submissions will not be accepted.

10. **Instructional Method:** Conventional.