**APPENDIX I: NEW RESEARCH COURSE DESCRIPTIONS**

New Research courses required for S-STEM are as follows:

**20ENFD3020 Undergraduate Research I (2 credits)**

Includes completing research skills workshops and research enrichment seminars

Conducting research and production of following deliverables: report, poster, and presentation

Take in parallel with or after 20BME2010 (4th or 5th class semester)

**20ENFD4020 Undergraduate Research II (1 credit)**

Conducting research and production of following deliverables: report, poster, and presentation

Take after ENFD3020 (5th or 6th class semester)

**20ENFD5020 Undergraduate Research III (1-12 credits)**

Summer research immersion for GSPT students

Conducting research and production of following deliverables: paper, poster, and presentation

Take after ENFD4020 (summer before senior year)

**20ENFD5030 Preparation for Graduate Research (1-12 credits)**

Summer research immersion for MS-ACCEND students

Conducting research with MS-thesis Advisor and producing following deliverables: report, poster, and presentation

Present MS thesis Proposal & Obtain Feedback (Note: Student will be classified as a graduate student in the senior year and as per CEAS Graduate Office rules can only have formal MS thesis proposal defense after receiving graduate student status)

Take after ENFD4020 (summer before senior year)

Full course descriptions for each follow. These will be filed for course approval upon receiving funding notification.

**I.A 20ENFD3020: UNDERGRADUATE RESEARCH I**

**Instructor:**

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**COURSE CREDITS**

2 credits: 1 credit for workshops and seminars and 1 credit for conducting and reporting the research

**COURSE OBJECTIVE**

Students will acquire training in various aspects of the research process, including research dissemination, ethical responsibility and conduct.

**COURSE GOAL**

Students will develop an ability to conduct research on a topic of their interest, and share the outcomes of their research with the relevant technical community.

**COURSE PREREQUISITES/COREQUISITES**

20BME 2010 Research Methods

Acceptance in S-STEM program

**COURSE CONTENTS**

Following are the topics of the workshops and seminars for the course:

* Skills Development Workshops:
  1. Safety Training
  2. Technical Writing and Presentation (Oral and Written)
  3. Online Literature Search
  4. Project Documentation: Photography & Video Recording
  5. Public Speaking and Communications
  6. Poster Making
  7. Statistical & Uncertainty Analysis in Research
* Enrichment Seminars

1. Ethics in Engineering Research
2. Taking Research from Lab to Real World
3. Graduate Education Opportunities & Application Process

**COURSE GRADING**

Grades will be based on attendance and class performance as measured by relevant assessment instruments.

**Assessment Instruments:**

The students will submit following deliverables using the format supplied:

1. Two-page summary of each seminar/workshop,
2. Summary of research project,
3. Interim reports and PowerPoint presentations (2 per semester)
4. Final Technical Paper
5. Final PowerPoint Presentation,
6. Final Display Poster

Note:

* Students will complete the Prior Research Experience Exposure Survey prior to starting the course.
* The students will give two monthly interim progress reports and presentations on their research during the semester.
* The students will give final presentations (PowerPoint and poster) near the end of the semester.
* Final deliverables (paper, presentation and poster) will be juried at the end of semester.
* The paper will be due one week prior to the presentation day. The students will also participate in the UC Undergraduate Poster Forum in the Spring Semester.
* Students will complete the Post UGR Satisfaction Survey and the Post UGR Rating Survey after the presentations.

**I.B 20ENFD4020: UNDERGRADUATE RESEARCH II**

**Instructor:**

Dr. Anant R. Kukreti

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College of Engineering and Applied Science

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**COURSE CREDITS**

1 credit for conducting and reporting the research

**COURSE OBJECTIVE**

Students will build on previously acquired training the research process.

**COURSE GOAL**

Students will develop an ability to conduct research on a topic of their interest, and share the outcomes of their research with the relevant technical community.

**COURSE PREREQUISITES**

20ENFD3020 Undergraduate Research I

Acceptance in S-STEM program

**COURSE GRADING**

Grades will be based performance as measured by relevant assessment instruments.

**Assessment Instruments:**

The students will submit following deliverables using the format supplied:

1. Summary of research project
2. Interim reports and PowerPoint presentations (2 per semester)
3. Final Technical Paper
4. Final PowerPoint Presentation,
5. Final Display Poster

Note:

* Students will complete the Prior Research Experience Exposure Survey prior to starting the course.
* The students will give two monthly interim progress reports and presentations on their research during the semester.
* The students will give final presentations (PowerPoint and poster) near the end of the semester.
* Final deliverables (paper, presentation and poster) will be juried at the end of semester.
* The paper will be due one week prior to the presentation day. The students will also participate in the UC Undergraduate Poster Forum in the Spring Semester.
* Students will complete the Post UGR Satisfaction Survey and the Post UGR Rating Survey after the presentations.

**I.C 20ENFD5020: UNDERGRADUATE RESEARCH III I\EX**

**Instructor:**

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**COURSE CREDITS**

1-12 credits for conducting and reporting the research

**COURSE OBJECTIVE**

Students will build on previously acquired training the research process.

**COURSE GOAL**

Students will develop an ability to conduct research on a topic of their interest, and share the outcomes of their research with the relevant technical community. This is a team-based summer immersion experience.

**COURSE PREREQUISITES**

20ENFD4020 Undergraduate Research II

Acceptance in S-STEM program

MS-ACCEND Students should enroll in 20ENFD5030: Preparation for Graduate Research

**COURSE GRADING**

Grades will be based performance as measured by relevant assessment instruments.

**Assessment Instruments:**

The students will submit following deliverables using the format supplied:

1. Summary of research project,
2. Interim reports and PowerPoint presentations
3. Final Technical Paper
4. Final PowerPoint Presentation,
5. Final Display Poster

Note:

* Students will complete the Prior Research Experience Exposure Survey prior to starting the course.
* The students will give bi-weekly interim progress reports and presentations on their research during the semester.
* The students will give final presentations (PowerPoint and poster) near the end of the semester.
* Final deliverables (paper, presentation and poster) will be juried at the end of semester.
* The paper will be due one week prior to the presentation day. The students will also participate in the UC Undergraduate Poster Forum in the Spring Semester.
* Students will complete the Post UGR Satisfaction Survey and the Post UGR Rating Survey after the presentations.

**I.D 20ENFD5030: PREPARATION FOR GRADUATE RESEARCH**

**Instructor:**

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**COURSE CREDITS**

1-12 credits for conducting and reporting the research

**COURSE OBJECTIVE**

Students will complete an MS Thesis proposal.

**COURSE GOAL**

Students will complete a MS thesis proposal in cooperation with their thesis advisor, including topic identification, background literature research, preliminary laboratory/simulation studies, and drafting on their MS thesis proposal.

**COURSE PREREQUISITES**

20ENFD4020 Undergraduate Research II

Acceptance in S-STEM program

Participation in MS-ACCEND program

**COURSE GRADING**

Grades will be based performance as measured by relevant assessment instruments.

**Assessment Instruments:**

The students will submit following deliverables using the format supplied:

1. Summary of research project,
2. Interim reports and PowerPoint presentations (2 per semester)
3. Final PowerPoint Presentation,
4. Final Display Poster
5. MS Thesis proposal

Note:

* Students will complete the Prior Research Experience Exposure Survey prior to starting the course.
* The students will give bi-weekly interim progress reports and presentations on their research during the semester.
* The students will give final presentations (PowerPoint and poster) near the end of the semester.
* Final deliverables (thesis proposal, presentation and poster) will be juried at the end of the semester.
* Students will complete the Post UGR Satisfaction Survey and the Post UGR Rating Survey after the presentations.