Research Foundations
ECAS 2990 (401); Spring 2022

Day/Time: Monday, 9:00 AM
Course Location: Watt Innovation Center, Room 331

Coordinating Instructor*: 
Ms. Cora Allard (she/her/hers)
Office: 301 Watt
Email: callara@clemson.edu
Office Hours (in person or virtual): M/W 1:00-2:00 PM. For course conflicts, appointments at other times may be made.

*Email this instructor with questions related to attendance, class structure, etc. She will coordinate notification and any changes necessary. Emails related to module content should be sent to the instructor designated as the point of contact within the Tentative Topical Outline (last page of this syllabus).

Additional Instructors:
Dr. Joshua Alper (he/him/his)
Office: Kinard Lab Rm 302b
Email: alper@clemson.edu
Dr. Marian Kennedy (she/her/hers)
Office: Olin Hall Rm. 201b
Email: mskenne@clemson.edu

Course Description:
Research is the development of knowledge that is not just new to you, but new to your discipline. This course will help you understand what research is, is not and how to participate. It is open to all students who have not conducted research previously and would like some guidance prior to applying for an experience through a Creative Inquiry team, a National Science Foundation Research Experience for Undergraduates (REU) program, or any one of many ways to participate in research as a Clemson undergraduate. This will be a 1 credit course where students prepare for applying to a research group and gain the skills needed to conduct research. The course will be split into the following topics:
(1) What is research?
(2) Undergraduate research opportunities and how to apply to them
(3) Skills and best practices for conducting research
(4) STEM degrees and graduate programs

Student Learning Outcomes:
- Explain what research is and who various members of the research community are
- Explain the scientific method and types of research programs
- Identify pathways to seek undergraduate research experiences
- Create professional correspondence seeking research positions
• Communicate their experience and background in a professional manner
• Complete initial online safety and responsible conduct of research training
• Describe the required techniques for record keeping and documentation during research projects
• Describe how research is disseminated
• Explain the proposal submission, funding, and reporting process for materials research
• Describe pathways to pursue a research career and the application for advanced degrees in STEM fields
• Describe the importance of inclusion and diversity within the research community

Grading:

Tentative Topical Outline:

Assignments are weighted by group:

<table>
<thead>
<tr>
<th>Group</th>
<th>Weight</th>
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</thead>
<tbody>
<tr>
<td>Module 01: What can you expect to do as an undergraduate research assistant? (Allard)</td>
<td>6%</td>
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<tr>
<td>Module 02: What is research and how are researchers trained? (Kennedy)</td>
<td>6%</td>
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<td>Module 03: Interviewing a principal investigator (researcher who has earned a PhD and leads a research team) (Kennedy)</td>
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<td>Module 04: Interviewing a Graduate Student (who is earning a PhD) (Kennedy)</td>
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<td>Module 05: Creating your resume to apply for research positions and drafting your initial emails to potential research mentors or program administrators (Kennedy)</td>
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<td>Module 06: Applying to the Clemson Creative Inquiry program (Allard)</td>
<td>6%</td>
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<td>Module 07: Applying to undergraduate research programs supported by NSF (Alper)</td>
<td>6%</td>
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<tr>
<td>Module 08: Safety and RCR Training (Allard)</td>
<td>10%</td>
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<td>Module 09: Tips for time management (Kennedy)</td>
<td>7%</td>
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<td>Module 10: Documenting your research in laboratory notebooks and on servers/cloud (Alper)</td>
<td>7%</td>
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<td>Module 11: Finding research articles (Alper)</td>
<td>7%</td>
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<td>Module 12: Reading research articles and understanding the peer review process (Alper)</td>
<td>7%</td>
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<td>Module 13: Disseminating research at conferences or seminars (Alper)</td>
<td>7%</td>
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<td>Module 14: How to write abstract for a conference (Allard)</td>
<td>7%</td>
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<td>Module 15: Pursuing an advanced degree in a STEM field (Allard)</td>
<td>6%</td>
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<td>Total</td>
<td>100%</td>
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Course Required Materials:
• Functioning laptop
• Google Drive
• Pen
• Laboratory Notebook
• Moleskin Notebook

Communications
Because of privacy regulations, University faculty and staff may email students only through Clemson email. Therefore, you must use your Clemson email account in this course for all email communications. Check your Clemson account at least three times per week for important messages. When emailing an instructor, the following format will be used:

1. Subject line should include the name of course/section being taken (“ECAS 2990: YOUR NAME”)
2. Address faculty member by name (“Shen/Mr. Shen/Dr. Shen/Prof. Shen”)
3. Describe reason for contact in complete sentences.
4. Sign email with name, department, and contact information (email, phone number). This is a professional signature for emails that you would be expected to use in your first positions once graduated from Clemson University.

Instructor Response Time: Instructor response time for this class will be 24 Hours (business days) for questions posted in the Q&A Discussion Board or emailed directly to the instructor. This response time excludes weekends, official university closures, and other times as noted by the instructors. Should you need ‘live’ assistance, email any of us to arrange an online or phone consultation.

*Email the coordinating instructor with questions related to attendance, class structure, etc. She will coordinate notification and any changes necessary (Ms. Allard). Emails related to module content should be sent to the instructor designated as the point of contact within the Tentative Topical Outline (Dr. Kennedy, Dr. Alper or Ms. Allard) that is located on the last.

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All undergraduate and graduate students, faculty and administrators at Clemson University are expected to abide by ethical standards of conduct. The Academic Integrity Policy is stated in the Undergraduate Announcements and the College Honor Code is available on the College website. In particular, plagiarism is a serious academic offense. Copying or submitting any work done by others for your personal credit – for example, copying homework or test work, using excerpts from others work without citation, using a solutions manual for your work submitted for credit, placing your name on a group document on which you did not participate, or placing your name on a document or work that was developed by another person(s), or using unauthorized reference material on tests – is plagiarism. Violators typically receive an ‘F’ in the course and could face University expulsion.

Accessibility
Clemson University values the diversity of our student body as a strength and a critical component of our dynamic community. Students with disabilities or temporary injuries/conditions may require accommodations due to barriers in the structure of
facilities, course design, technology used for curricular purposes, or other campus resources. Students who experience a barrier to full access to this class should let the professor know, and make an appointment to meet with a staff member in Student Accessibility Services as soon as possible. You can make an appointment by calling 864-656-6848, by emailing studentaccess@lists.clemson.edu or by visiting Suite 239 in the Academic Success Center building. Appointments are strongly encouraged – drop-ins will be seen if at all possible, but there could be a significant wait due to scheduled appointments. Students who receive Academic Access Letters are strongly encouraged to request, obtain and present these to their professors as early in the semester as possible so that accommodations can be made in a timely manner. It is the student’s responsibility to follow this process each semester. You can access further information here: http://www.clemson.edu/campus-life/campus-services/sds/

Title IX

Clemson University is committed to a policy of equal opportunity for all persons and does not discriminate on the basis of race, color, religion, sex, sexual orientation, gender, pregnancy, national origin, age, disability, veteran’s status, genetic information or protected activity (e.g., opposition to prohibited discrimination or participation in any complaint process, etc.) in employment, educational programs and activities, admissions and financial aid. This includes a prohibition against sexual harassment and sexual violence as mandated by Title IX of the Educational Amendments of 1972. This policy is located at http://www.clemson.edu/campus-life/campus-services/access/title-ix/. Mr. Jerry Knighton is the Clemson University Title IX Coordinator and Director of Access and Equity, located at 111 Holtzendorff Hall, 864-656-3181 (voice) or 864-565-0899 (TDD).

Tentative Topical Outline:

- What is research?
  - What can you expect to do as an undergraduate research assistant? (Week 1) - Allard
  - What is research and who are researchers (Week 2) – Kennedy
  - Interviewing a principal investigator (researcher who has earned a PhD and leads a research team) (Week 3) - Kennedy
  - Interviewing a Graduate Student (who is earning a PhD) (Week 4) - Kennedy
- Undergraduate research opportunities and how to apply to them
  - Creating your resume to apply for research positions and drafting your initial emails to potential research mentors or program administrators (Week 5) – Kennedy
  - Applying to projects hosted by the Clemson Creative Inquiry program (Week 6) - Allard
  - Applying to undergraduate research programs supported by NSF (Week 7) - Alper
- Skills and Best Practices for Conducting Research
  - Basic online safety and RCR training (Week 8) - Allard
  - Tips for time management (Week 9) - Kennedy
  - Documenting your research in laboratory notebooks (Week 10) - Alper
  - Finding research articles and building a reference library (Week 11) - Alper
  - Reading research articles and understanding the peer review process (Week 12) – Alper
  - Disseminating research at conferences – poster and oral presentations (Week 13) - Alper
  - How to write abstract for a conference (Week 14) - Allard
- STEM Degrees and Graduate School
  - Pursuing an advanced degree in a STEM field (Week 15) - Allard