



Course Title:	International Independent Research in STEM Fields
Course Code:	AUUQ RSLW 392S
Subject:	Science, Technology, Engineering & Mathematics
Credits:	6
Semester/Term:	<input type="checkbox"/> Spring <input type="checkbox"/> Fall <input checked="" type="checkbox"/> Summer
Course Description:	<p>STEM Research 392 is an independent research program established to meet National Science Foundation (NSF), National Institute of Health (NIH), and Department of Education (DoE) guidelines.</p> <p>This program introduces undergraduate science, technology, engineering and mathematics majors to international collaborations and research experiences. The program will further student research interests, allow them to develop hands-on skills, and increase their research capacity all within a global context.</p> <p>In collaboration with a principal investigator, students will join a research group in their selected field of interest and work on a defined project. Students will participate as active members of the research group/team in a university or institutional setting.</p> <p>Students will work closely with research scientists, postdocs, graduate students, and or graduate students in the day-to-day research process. Students will be expected to master general and specialized scientific techniques, to show initiative, and to complete work independently.</p> <p>Student outcomes include a research paper consistent with the publishing standards of their respective disciplines and an oral defense presentation of their research results.</p>
Course Requirements:	<p>Course Format This course does not involve formal lecture and is delivered via directed study and supervision by the principal investigator for the specific research project undertaken by the student.</p> <p>Required Text Students will construct relevant bibliographies, under the guidance of the primary investigator. They will also be provided with a packet of information on scientific writing.</p>



	<p>Assignments Final course requirements and percentage weighting is at the discretion of the principal investigator and/or research mentor. The following is a general breakdown of the grading criteria for this program.</p> <table border="1"> <thead> <tr> <th>Course Requirements</th> <th>Percentages</th> <th>Criteria</th> </tr> </thead> <tbody> <tr> <td>1. Attendance</td> <td>5%</td> <td>Attitude & Participation</td> </tr> <tr> <td>2. Research Performance</td> <td>5%</td> <td>Safety, effort, skill development, and data analysis</td> </tr> <tr> <td>3. Research Notebook</td> <td>10%</td> <td>Completeness of laboratory notebook and associated data</td> </tr> <tr> <td>4. Literature Review</td> <td>15%</td> <td>Familiarity with and presentation of literature related to the project</td> </tr> <tr> <td>5. Research Understanding</td> <td>10%</td> <td>A deep knowledge of purpose and meaning of the performed research</td> </tr> <tr> <td>6. Final Research Paper (4,000 word minimum)</td> <td>45%</td> <td>Clarity of thought, quality of writing, and ability to craft a clear argument</td> </tr> <tr> <td>7. Oral Presentation</td> <td>10%</td> <td>Crafting an audience appropriate presentation and displaying strong presentation skills</td> </tr> <tr> <td>Total</td> <td>100%</td> <td></td> </tr> </tbody> </table>	Course Requirements	Percentages	Criteria	1. Attendance	5%	Attitude & Participation	2. Research Performance	5%	Safety, effort, skill development, and data analysis	3. Research Notebook	10%	Completeness of laboratory notebook and associated data	4. Literature Review	15%	Familiarity with and presentation of literature related to the project	5. Research Understanding	10%	A deep knowledge of purpose and meaning of the performed research	6. Final Research Paper (4,000 word minimum)	45%	Clarity of thought, quality of writing, and ability to craft a clear argument	7. Oral Presentation	10%	Crafting an audience appropriate presentation and displaying strong presentation skills	Total	100%	
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<p>Learning Outcomes and/or Expected Student Competencies:</p>	<p>On completion of the course, students should be able to:</p> <table border="1"> <thead> <tr> <th>Learning Outcomes</th> <th>Course Requirement that will be used to assess the student's achievement of this outcome</th> </tr> </thead> <tbody> <tr> <td>Demonstrate proficiency in problem identification and analysis</td> <td>Research Notebook, Literature Review, Final Research Paper</td> </tr> <tr> <td>Discuss and implement good principles of good experimental design</td> <td>Attendance, Research Performance, Oral Presentation, Final Research Paper</td> </tr> </tbody> </table>	Learning Outcomes	Course Requirement that will be used to assess the student's achievement of this outcome	Demonstrate proficiency in problem identification and analysis	Research Notebook, Literature Review, Final Research Paper	Discuss and implement good principles of good experimental design	Attendance, Research Performance, Oral Presentation, Final Research Paper																					
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	Apply research skills appropriate to their areas of specialization	Research Performance, Research Notebook, Final Research Paper
	Demonstrate proficiency in literature searching, analysis, and interpretation	Literature Review, Research Understanding, Final Research Paper
	Analyze data, and interpret and present results	Research Understanding, Oral Presentation, Final Research Paper
	Utilize principles and practice of statistical analysis and/or other state of the art analysis and research tools relevant to their research interests	Research Performance, Research Notebook, Oral Presentation, Final Research Paper
	Write detailed scientific papers	Final Research Paper
	Present research results orally	Oral Presentation
Other Policies:	<p>Expectations Professional behavior is expected of all students. This includes adherence to all safety protocols, preparation for meetings, on-time arrival for meetings with the principal investigator, attendance at all group laboratory meetings and appropriate participation in the form of attentiveness in the laboratory and contributions to the project and overall goals of the research group. Respect for the academic process is the major guiding principle for professional behavior and extends to all communications, including e-mail.</p> <p>Attendance/Participation Prompt attendance, full preparation, and active participation in the laboratory and associated meetings are expected from every student as an associate member of the research group.</p> <p>Course Policies For e-mail communications, students must use their Arcadia University e-mail account. Students are responsible for any information provided by e-mail or through Intranet postings.</p> <p>Plagiarism Representation of another's work or ideas as one's own in academic submissions is plagiarism, and is cause for disciplinary action. <i>Cheating</i> is actual or attempted use of resources not authorized by the instructor(s) for academic submissions. Students caught cheating in this course will receive a failing grade. <i>Fabrication</i> is the falsification or creation of data, research or resources to support academic submissions, and cause for disciplinary action.</p>	



	<p>Late or Missed Assignments Will not be accepted for grading.</p> <p>Students with Disabilities Persons with documented disabilities requiring accommodations to meet the expectations of this course should disclose this information while enrolling into the program, and before leaving the United States so that appropriate arrangements can be made.</p> <p>Title IX Statement Arcadia University is committed to assuring a safe and productive educational environment for all students. In order to meet this commitment and to comply with Title IX of the Education Amendments of 1972 and guidance from the Office for Civil Rights, the University requires faculty members to report incidents of sexual violence shared by students to the University's Title IX Coordinator. The only exceptions a faculty member's reporting obligation are when incidents of sexual violence are communicated by a student during a classroom discussion, in a writing assignment for a class, or as part of a University-approved research project. Information regarding the reporting of sexual violence and the resources that are available to victims of sexual violence is set forth at https://www.arcadia.edu/university/policies-guidelines/title-ix.</p>
Prerequisites:	Students should have completed the basic science/engineering courses in their field.