



<b>Course Title:</b>	<b>International Independent Research in STEM Fields</b>
<b>Course Code:</b>	DUBI RSLW 392S
<b>Subject:</b>	Science, Technology, Engineering & Mathematics
<b>Credits:</b>	6
<b>Semester/Term:</b>	<input type="checkbox"/> Spring <input type="checkbox"/> Fall <input checked="" type="checkbox"/> Summer
<b>Course Description:</b>	<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>
<b>Course Requirements:</b>	<p><b>Course Format</b> 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><b>Required Text</b> 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><b>Assignments</b> 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 data-bbox="444 541 911 575">Course Requirements</th> <th data-bbox="915 541 1117 575">Percentages</th> <th data-bbox="1122 541 1443 575">Criteria</th> </tr> </thead> <tbody> <tr> <td data-bbox="444 581 911 615">1. Attendance</td> <td data-bbox="915 581 1117 615">5%</td> <td data-bbox="1122 581 1443 615">Attitude &amp; Participation</td> </tr> <tr> <td data-bbox="444 621 911 720">2. Research Performance</td> <td data-bbox="915 621 1117 720">5%</td> <td data-bbox="1122 621 1443 720">Safety, effort, skill development, and data analysis</td> </tr> <tr> <td data-bbox="444 726 911 825">3. Research Notebook</td> <td data-bbox="915 726 1117 825">10%</td> <td data-bbox="1122 726 1443 825">Completeness of laboratory notebook and associated data</td> </tr> <tr> <td data-bbox="444 831 911 930">4. Literature Review</td> <td data-bbox="915 831 1117 930">15%</td> <td data-bbox="1122 831 1443 930">Familiarity with and presentation of literature related to the project</td> </tr> <tr> <td data-bbox="444 936 911 1035">5. Research Understanding</td> <td data-bbox="915 936 1117 1035">10%</td> <td data-bbox="1122 936 1443 1035">A deep knowledge of purpose and meaning of the performed research</td> </tr> <tr> <td data-bbox="444 1041 911 1182">6. Final Research Paper (4,000 word minimum)</td> <td data-bbox="915 1041 1117 1182">45%</td> <td data-bbox="1122 1041 1443 1182">Clarity of thought, quality of writing, and ability to craft a clear argument</td> </tr> <tr> <td data-bbox="444 1188 911 1329">7. Oral Presentation</td> <td data-bbox="915 1188 1117 1329">10%</td> <td data-bbox="1122 1188 1443 1329">Crafting an audience appropriate presentation and displaying strong presentation skills</td> </tr> <tr> <td data-bbox="444 1335 911 1367"><b>Total</b></td> <td data-bbox="915 1335 1117 1367">100%</td> <td data-bbox="1122 1335 1443 1367"></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	<b>Total</b>	100%	
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<p><b>Learning Outcomes and/or Expected Student Competencies:</b></p>	<p>On completion of the course, students should be able to:</p> <table border="1"> <thead> <tr> <th data-bbox="444 1444 943 1549">Learning Outcomes</th> <th data-bbox="948 1444 1443 1549">Course Requirement that will be used to assess the student's achievement of this outcome</th> </tr> </thead> <tbody> <tr> <td data-bbox="444 1556 943 1623">Demonstrate proficiency in problem identification and analysis</td> <td data-bbox="948 1556 1443 1623">Research Notebook, Literature Review, Final Research Paper</td> </tr> <tr> <td data-bbox="444 1629 943 1696">Discuss and implement good principles of good experimental design</td> <td data-bbox="948 1629 1443 1696">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
<b>Other Policies:</b>	<p><b>Expectations</b> 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><b>Attendance/Participation</b> 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><b>Course Policies</b> 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><b>Plagiarism</b> 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><b>Late or Missed Assignments</b> Will not be accepted for grading.</p> <p><b>Students with Disabilities</b> 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><b>Title IX Statement</b> 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 <a href="https://www.arcadia.edu/university/policies-guidelines/title-ix">https://www.arcadia.edu/university/policies-guidelines/title-ix</a>.</p>
<b>Prerequisites:</b>	Students should have completed the basic science/engineering courses in their field.

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