



**FLORIDA  
ATLANTIC  
UNIVERSITY**

## COURSE CHANGE REQUEST Undergraduate Programs

**Department** Electrical Engineering and Computer Science

**College** Engineering and Computer Science

UUPC Approval 4/24/23

UFS Approval \_\_\_\_\_

SCNS Submittal \_\_\_\_\_

Confirmed \_\_\_\_\_

Banner Posted \_\_\_\_\_

Catalog \_\_\_\_\_

**Current Course Prefix and Number** CAP 2753

**Current Course Title** Experimental Design and Data Analysis

*Syllabus must be attached for ANY changes to current course details. See [Template](#). Please consult and list departments that may be affected by the changes; attach documentation.*

**Change title to:**  
RI: Experimental Design and Data Analysis

**Change description to:**

**Change prefix**

**From:** \_\_\_\_\_ **To:** \_\_\_\_\_

**Change course number**

**From:** \_\_\_\_\_ **To:** \_\_\_\_\_

**Change credits\***

**From:** \_\_\_\_\_ **To:** \_\_\_\_\_

**Change grading**

**From:** \_\_\_\_\_ **To:** \_\_\_\_\_

**Change WAC/Gordon Rule status\*\***

Add  Remove

**Change General Education Requirements\*\*\***

Add  Remove

\*See [Definition of a Credit Hour](#).

\*\*WAC/Gordon Rule criteria must be indicated in syllabus and approval attached to this form. See [WAC Guidelines](#).

\*\*\*GE criteria must be indicated in syllabus and approval attached to this form. See [Intellectual Foundations Guidelines](#).

**Change prerequisites/minimum grades to:**

**Change corequisites to:**

**Change registration controls to:**

Please list existing and new pre/corequisites, specify AND or OR and include minimum passing grade (default is D-).

**Effective Term/Year for Changes:** Spring, 24

**Terminate course? Effective Term/Year for Termination:** No

**Faculty Contact/Email/Phone** Dr. Valentine Aalo/aalo@fau.edu/561-297-3485

**Approved by**

Department Chair \_\_\_\_\_

College Curriculum Chair Hongbo Su

College Dean \_\_\_\_\_

UUPC Chair Ethlyn Williams

Undergraduate Studies Dean Dan Meeroff

UFS President \_\_\_\_\_

Provost \_\_\_\_\_

**Date**

4/10/23

04/14/2023

4.15.23

4/24/23

4/24/23

Email this form and syllabus to [mjenning@fau.edu](mailto:mjenning@fau.edu) seven business days before the UUPC meeting.

**Department of Computer and Electrical Engineering  
and computer Science  
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Course Syllabus**

<b>1. Course title/number, number of credit hours</b>	
RI: CAP 2753 Experimental Design and Data Analysis	3 credit hours
<b>2. Course prerequisites, corequisites, and where the course fits in the program of study</b>	
Prerequisite: STA 2023 Introduction to Statistics	
<b>3. Course logistics</b>	
<p>Term: Spring 2023  This is a classroom lecture course  Class location and time: W-F 9:30 – 10:50am</p> <p>This course has limited design content.</p>	
<b>4. Instructor contact information</b>	
<i>Instructor's name</i> <i>Office address</i> <i>Office Hours</i> <i>Contact telephone number</i> <i>Email address</i>	Dr. Valentine A. Aalo, Professor EE415 Engineering East (EE-96) W-F 11:00am – 2:00pm or by appointment (561) 297-3485 <a href="mailto:aalo@fau.edu">aalo@fau.edu</a>
<b>5. TA contact information</b>	
<i>TA's name</i> <i>Office address</i> <i>Office Hours</i> <i>Contact telephone number</i> <i>Email address</i>	N/A
<b>6. Course description</b>	
This course deals with principles of experimental design and data analysis. Topics covered include design of experiments, sampling and analysis of resulting data. This is a research-intensive (RI) course.	
<b>Research-intensive information:</b>	
This course contains multiple assignments designed to help students conduct research and inquiry at an intensive level. If this class is selected to participate in the university-wide assessment program, students will be asked to complete a consent form and submit electronically some of their research assignments for review. Visit the Office of Undergraduate Research and Inquiry (OURI) for additional opportunities and information at <a href="http://www.fau.edu/ouri">http://www.fau.edu/ouri</a> .	
<b>7. Course objectives/student learning outcomes/program outcomes</b>	
<i>Course objectives</i>	To enable students to understand basic concept of experimental design and data analysis tools and techniques with an emphasis on real world applications.

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<p><i>Student learning outcomes &amp; relationship to ABET 1-7 objectives</i></p>	<p>Ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics (1) Ability to communicate effectively with a range of audiences (2)</p>
<p><b>8. Course evaluation method</b></p>	
<p>Homework Assignments 40% Midterm Exam 20% Class Project 40%</p>	<p><i>Note:</i> The minimum grade required to pass the course is C.</p>
<p><b>Class Project Grading:</b></p> <ul style="list-style-type: none"> <li>• Project proposal – 10%</li> <li>• OURI application – 5%</li> <li>• Oral presentation – 5%</li> <li>• Final report – 20%</li> </ul>	<p><b>Possible Research Project Topics:</b></p> <ul style="list-style-type: none"> <li>• Machine learning based gap-acceptance modeling</li> <li>• Critical gap estimation methodologies</li> <li>• Interference modeling at busy traffic intersections</li> <li>• Machine learning for radio environment awareness decision making</li> <li>• Quality-of-experience-oriented autonomous intersection control</li> </ul>
<p><b>9. Course grading scale</b></p>	
<p>Grading Scale: A: 90-100; A-: 85-89; B+: 80-84; B: 75-79; B-: 70-74; C+: 65-69; C: 60-64; C-: 55-59; D+: 50-54; D: 40-49 F: less than 40</p>	
<p><b>10. Policy on makeup tests, late work, and incompletes</b></p>	
<p><i>Makeup tests</i> are given only if there is solid evidence of a medical or otherwise serious emergency that prevented the student of participating in the exam.</p> <p>All assignments are due by 11:59 pm on the due date indicated in the course schedule. Late assignments will be graded with a penalty of 10% of the grade for each day after the assignment's due date, up to a maximum of 3 days late (i.e., 30% penalty), beyond which the assignment will receive a grade o (zero).</p> <p><i>Incomplete grades</i> are against the policy of the department. Unless there is solid evidence of medical or otherwise serious emergency situation incomplete grades will not be given.</p>	
<p><b>11. Special course requirements</b></p>	
<p>Some computer design problems based on Matlab will be assigned. Although familiarity with Matlab will be helpful, it is not a requirement.</p> <ul style="list-style-type: none"> <li>• Projects are expected to achieve all six of the following OURI Student Learning Outcomes (SLOs):             <ul style="list-style-type: none"> <li>o SLO 1: Knowledge. Students are expected to demonstrate content knowledge, and knowledge of core principles and skills.</li> <li>o SLO 2: Formulate Questions. Students are required to formulate research questions, scholarly</li> </ul> </li> </ul>	

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- o or creative problems in a manner appropriate to the planning discipline.
- o SLO 3: Plan of Action. Students are expected to develop and implement a plan of action to address research and inquiry questions or scholarly problems.
- o SLO 4: Critical Thinking. Students are expected to apply critical thinking skills to evaluate information, their own work, and the work of others.
- o SLO 5: Ethical Conduct. Students are expected to identify significant ethical issues in research and inquiry and/or address them in practice.
- o SLO 6: Communication. Students will convey all aspects of their research and inquiry (processes and/or products) in appropriate formats, venues, and delivery modes

OURI Student Learning Outcomes (SLO)	Description of Assignment Requirements and Assessments
LO 1: Knowledge	Students will demonstrate a fundamental basis of discipline-specific knowledge required for effective professional practice in the fields of computer and electrical engineering. Students will also demonstrate working knowledge of tools and practical skills needed to analyze engineering design problems related to multiple realistic constraints, such as environmental issues, engineering economics, design codes, ethics, and/or other contemporary design issues.
SLO 2: Formulate Questions	Students will develop and refine a problem statement in which they specifically address their research questions. Students are expected to articulate the scope of the problem to be able to address the research question with an engineering solution. When appropriate, students should be able to create additional (albeit related) questions for smaller subsections of the overall design project
SLO 3: Plan of Action	Students will create a plan of action that will include the problem statement (or research question), scope of work, literature review and background context, methodology or approach to the solution, analysis plan, conclusion and design documents. Students will develop a hypothesis if needed, identify research methods and alternative designs, and select appropriate statistical techniques, if warranted.
SLO 4: Critical Thinking	Students will demonstrate critical thinking skills by taking into consideration multiple perspectives and examining implications and consequences of design decisions or engineering alternatives. Students will also demonstrate an ability to use evidence and reasoning to objectively justify decisions and an ability to apply codes and design standards to make reasonable engineering judgments. Students are asked to peer review student work and provide feedback during the juried presentations.
SLO 5: Ethical Conduct	Students will familiarize themselves with the Code of Ethics of their engineering discipline. All work is held to the standards established by the governing professional societies of ocean and mechanical engineering disciplines.
SLO 6: Communication	Students will present and defend their work in written and oral formats (proposal and final report). All deliverables are expected to be of professional quality. Students are expected to demonstrate knowledge of technical report writing, graphical visualization, and persuasive presentation skills.

**12. Classroom etiquette policy**

University policy requires that in order to enhance and maintain a productive atmosphere for education, personal communication devices, such as cellular phones and laptops, are to be disabled in class sessions.

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<b>13. Disability policy statement</b>	
In compliance with the Americans with Disabilities Act Amendments Act (ADAAA), students who require reasonable accommodations due to a disability to properly execute coursework must register with Student Accessibility Services (SAS) and follow all SAS procedures. SAS has offices across three of FAU's campuses – Boca Raton, Davie and Jupiter – however disability services are available for students on all campuses. For more information, please visit the SAS website at <a href="http://www.fau.edu/sas/">www.fau.edu/sas/</a> .	
<b>14. Honor code policy</b>	
Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high-quality education in which no student enjoys unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and place high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. See University Regulation 4.001 at <a href="http://www.fau.edu/regulations/chapter4/4.001_Code_of_Academic_Integrity.pdf">www.fau.edu/regulations/chapter4/4.001_Code_of_Academic_Integrity.pdf</a>	
<b>15. Required texts/reading</b>	
Fundamentals of Statistical Experimental Design and Analysis, by Robert G. Easterling ISBN-13 978-1118954638, ISBN-10: 1118954637, Wiley, 2015. (Available online at the FAU Library)	
<b>16. Supplementary/recommended readings</b>	
<ol style="list-style-type: none"> <li>1. Statistical Design and Analysis of Experiments with Applications to Engineering and Science, Robert L. Mason, Richard F. Gunst, and James L. Hess, 2nd Edition, Wiley 2003.</li> <li>2. Probability &amp; Statistics for Engineers, R.E Walpole, R.H. Myers, S.L Myers, and K. Ye, 7th Edition, Prentice Hall, 2002.</li> </ol>	
<b>17. Course topical outline, including dates for exams/quizzes, papers, completion of reading</b>	
<ol style="list-style-type: none"> <li>1. Introduction - Experimental design and data analysis</li> <li>2. The art of data presentation</li> <li>3. Summarizing measured data</li> <li>4. Comparing populations using sample data</li> <li>5: Simple linear regression models</li> <li>6: Different experimental design models</li> <li>7. <b>Project proposal development and assignment</b></li> <li>8: Tools for experimental design and data analysis</li> <li>9: One-factor, two-factor and k-factor designs</li> <li>10: Logistic Regression models for classification</li> <li>11: Case Studies and final reports</li> <li>12: Oral presentations by students</li> </ol>	
<b>Tentative Due Dates</b>	
Midterm Exam: 3/16/23	OURI Application: 4/02/23
Project Proposal: 3/26/23	Final Project Report: 4/20/23
	Oral Presentations: 4/20-4/30/23

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**Additional University Policies**

**Attendance Policy**

Students are expected to attend all of their scheduled University classes and to satisfy all academic objectives as outlined by the instructor. The effect of absences upon grades is determined by the instructor, and the University reserves the right to deal at any time with individual cases of non-attendance. Students are responsible for arranging to make up work missed because of legitimate class absence, such as illness, family emergencies, military obligation, court-imposed legal obligations or participation in University-approved activities. Examples of University-approved reasons for absences include participating on an athletic or scholastic team, musical and theatrical performances and debate activities. It is the student's responsibility to give the instructor notice prior to any anticipated absences and within a reasonable amount of time after an unanticipated absence, ordinarily by the next scheduled class meeting. Instructors must allow each student who is absent for a University-approved reason the opportunity to make up work missed without any reduction in the student's final course grade as a direct result of such absence.

**Counseling and Psychological Services (CAPS) Center**

Life as a university student can be challenging physically, mentally and emotionally. Students who find stress negatively affecting their ability to achieve academic or personal goals may wish to consider utilizing FAU's Counseling and Psychological Services (CAPS) Center. CAPS provides FAU students a range of services – individual counseling, support meetings, and psychiatric services, to name a few – offered to help improve and maintain emotional well-being. For more information, go to <http://www.fau.edu/counseling/>