

 FLORIDA ATLANTIC UNIVERSITY	COURSE CHANGE REQUEST Undergraduate Programs	UUPC Approval <u>1/29/24</u> UFS Approval _____ SCNS Submittal _____ Confirmed _____ Banner Posted _____ Catalog _____
	Department Mathematics and Statistics College Science	
Current Course Prefix and Number MAP 4913	Current Course Title RI: Industrial Problems in Applied Math	
<i>Syllabus must be attached for ANY changes to current course details. See <u>Template</u>. Please consult and list departments that may be affected by the changes; attach documentation.</i>		
Change title to: Change prefix From: To: Change course number From: To: Change credits* From: To: Change grading From: To: Change WAC/Gordon Rule status** Add <input type="checkbox"/> Remove <input type="checkbox"/> Change General Education Requirements*** Add <input type="checkbox"/> Remove <input type="checkbox"/> <small>*See <u>Definition of a Credit Hour</u>.</small> <small>**WAC/Gordon Rule criteria must be indicated in syllabus and approval attached to this form. See <u>WAC Guidelines</u>.</small> <small>***GE criteria must be indicated in syllabus and approval attached to this form. See <u>Intellectual Foundations Guidelines</u>.</small>	Change description to: Change prerequisites/minimum grades to: MAP 2492 or ([MAP 2302 or MAP 3305] and [MAS 2103 or MAC 2313]) with minimum grade of "C" 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: Fall 2024	Terminate course? Effective Term/Year for Termination:	
Faculty Contact/Email/Phone Yuan Wang / ywang@fau.edu / (561) 297 2672		
Approved by Department Chair <u>Yuan Wang</u> College Curriculum Chair <u>[Signature]</u> College Dean <u>[Signature]</u> UUPC Chair <u>Korey Sorge</u> Undergraduate Studies Dean <u>Dan Macroff</u> UFS President _____ Provost _____	Date _____ 01/15/2024 _____ 01/19/24 _____ <u>1/19/24</u> _____ <u>1/29/24</u> _____ <u>1/29/24</u> _____ _____	

Email this form and syllabus to mjenning@fau.edu seven business days before the UUPC meeting.

MAP 4913-001
RI: Industrial Problems in Applied Mathematics

MWF 11:00 – 11:50
3 credits

Semester, Year
Prof. XXXXX YYYYY
Office: XXXXX
Office hours: MWF 11-12
Classroom: XXXX
Telephone: 561-297-XXXX
Email: zzzzz@fau.edu



TA name	xxxxxx xxxxxxxxx
Office	xxxxxx
Office hours	MWF xx:xx – xx:xx
Telephone	561-297-xxxx
Email	xxxxxx@fau.edu

Course Description

This research-intensive course pits students in small groups against real-world problems provided by industrial partners.

Instructional Method

In-Person. There is no remote option for this course.

Prerequisites/Corequisites

Minimum Grade of C in MAP 2492 or ([MAP 2302 or MAP 3305] and [MAS 2103 or MAC 2313])

Course Objectives/Student Learning Outcomes

The goal of this research intensive (RI) course is to engage math majors in industrial research, prepare them for industrial careers and to expose students to problems outside of academia that are mathematical in nature.

In this course, students work together in team of 3-5 students on a semester-long project. The projects are provided by external industrial partners. By the end of the course, each group will: (a) formulate a precise statement of the open-ended industry problem, (b) develop a plan of action for the main work on the problem, (c) produce a workable solution to their problem, (d) complete a 12-page written report, and (e) present a 12-minute oral report to their industrial partner. The main objective of the course is that each student, while working in a classroom setting, will experience how math is done in the real world.

Research Intensive Designation

This course contains an assignment 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 <http://www.fau.edu/ouri>.

The URI portion of the course will address all six Student Learning Objectives:

1. Knowledge: Students will demonstrate knowledge of Mathematical Modeling. In addition to the actual mathematics used in the model (differential equations, linear algebra, and/or statistics), the course will test students' knowledge of the modeling process (choosing and adapting an appropriate model and reassessing it), as well as the fitting of parameters using data sets.

2. Formulation of Questions: The project description provided by the industrial partner will be open-ended and will thus require students to arrive at their own interpretation and precise formulation of relevant questions (after performing appropriate background research). This will be an iterative process. After the students' initial proposed formulation of the main questions, the instructor will provide feedback, and the students will then adjust the statement of the problem. Then the industry partner will provide feedback on the students' interpretation of the main goals, and the students will again make appropriate changes.

3. Plan of Action: Using the course timeline as a template, each group is expected to set detailed and realistic goals, while placing emphasis on arriving at a workable end product that addresses the interests of the client.

4. Critical Thinking: The main work on the project will require critical thinking and problem solving at several steps: the modeling process, mathematical challenges, writing code, parameter fitting, optimization, analysis, and interpretation of results.

5. Ethical conduct: Plagiarism and proper citations will be discussed, and students will prepare the final report in a style conforming to a research article.

6. Communication: Students will demonstrate communication throughout the semester with several written and oral reports. They will also write a final research paper, and they will present their results to their industrial client in a final presentation.

Undergraduate Research Certificate

FAU now offers an Undergraduate Research Certificate to recognize undergraduate students for the systematic development of excellence in undergraduate research. Students seeking a certificate must complete 12 credits in research-intensive (RI), skill-building, exposure, and research dissemination activities. Successfully completing this course earns you three credits in research intensive coursework. Learn more about the RI Certificate here Office of Undergraduate Research and Inquiry (OURI) | Florida Atlantic University (fau.edu)

Course Evaluation Method

- **Homework/Class Attendance/Participation/Team Meetings: 20%** - There will be occasional separate homework assignments given to help you with the research project with Moffitt. As such, attendance and participation during class is essential. Homework will be relevant to their skills learned in the course. Examples are sample written assignments, slide presentations, literature search results, etc.
- **Biweekly Presentations 20%** - You will be required to give a group presentation every 2 weeks on your project. This is meant to practice your communication skills with others outside your project. Each group partner will be required to present for at least 5 minutes during each group presentation, and the presentation should go together seamlessly.
- **Biweekly Reports 20%** - Your goal is to work towards preparing a final technical report to your industrial partner. As such, you must do your individual part. You will be required to individually write about your project in LaTeX. This will include modifying your previously submitted report every two weeks according to the instructor's evaluations and adding in new material.
- **Final Group Presentation 20%** - Your group will give a final group presentation which will be videoed and sent to Moffitt. This presentation will be held during the final exam period for this course and should be 25 minutes.
- **Final Group Report 20%** - You will turn in a final report with references and figures, etc. based on the revisions from the previous biweekly reports.

Course Grading Scale

A	> 93%
A-	90-93%
B+	87-90%
B	83-87%
B-	80-83%
C+	77-80%
C	73-77%
C-	70-73%
D+	67-70%
D	63-67%
D-	60-63%
F	< 60%

Policy on Makeup Tests, Late Work, and Incompletes (if applicable)

Incomplete grades:

A grade of I (incomplete) will only be given under certain conditions and in accordance with the academic policies and regulations put forward in FAU University Catalog. The student has to show exceptional circumstances why requirements cannot be met. A request for an incomplete grade has to be made in writing with supporting documentation, where appropriate.

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/>

Disability Policy

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 www.fau.edu/sas/.

Code of Academic Integrity

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 an unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see [University Regulation 4.001](#).

Required Texts/Readings

There is no required text for this course.

Course Topical Outline

- Week 1 – Introduction to industrial mathematics and the PIC Math program.
- Week 2 – Group assignment and background research.
- Week 3 – Presentation and Q&A with industry partners.
- Week 4 – Formation of research plan.
- Week 5 – Data acquisition and literature search.
- Week 6 – Investigation and exposition of mathematical methods required.
- Week 7 – Coding approach to industry problem.
- Week 8 – Wrap up initial efforts in preparation for midterm.
- Week 9 – Presentation of rough draft of package for industry partners.
- Week 10 – Revise based on professor feedback.
- Week 11 – Explore further directions advised by professor.
- Week 12 – Wrap up new directions.
- Week 13 – Prepare for final presentation.
- Week 14 – Present final product to industry partners and PIC Math program.