	NEW COURSE PROPOSAL Graduate Programs	UGPC Approval _____
		UFS Approval _____
		SCNS Submittal _____
FLORIDA ATLANTIC UNIVERSITY	**Department** EECS	Confirmed _____
	College College of Eng & Comp Science (*To obtain a course number, contact **erudolph@fau.edu**)*	Banner _____ Catalog _____

Prefix CAP **Number** 6517	*(L = Lab Course; C = Combined Lecture/Lab; add if appropriate)* **Lab Code**	**Type of Course** Lecture	**Course Title** Computational Genomics
Credits *(See Definition of a Credit Hour)* 3	**Grading** *(Select One Option)* **Regular** ◉ **Sat/UnSat** ◯	\multicolumn{2}{l}{**Course Description** *(Syllabus must be attached; see Template and Guidelines)* This course focuses on the computational analysis of modern high-throughput genomic data. In particular, the course will cover the application of R packages in performing exploratory data analysis, predictive modeling, and addressing questions about different types of genomic data.}
Effective Date *(TERM & YEAR)* Spring 2023			

Prerequisites (COP 3035 and PCB 3063) or permission of instructor *Prerequisites, Corequisites and Registration Controls are enforced for all sections of course.*	**Academic Service Learning (ASL) course** ☐ Academic Service Learning statement must be indicated in syllabus and approval attached to this form.	
	Corequisites	**Registration Controls** *(For example, Major, College, Level)* CS, CE or AI majors cannot take the course.

Minimum qualifications needed to teach course: PhD in BME (or a closely related field).	**List textbook information in syllabus or here** Refer to the syllabus
Faculty Contact/Email/Phone Hanqi Zhuang/zhuang@fau.edu/561-297-3413	**List/Attach comments from departments affected by new course**

Email this form and syllabus to UGPC@fau.edu 10 days before the UGPC meeting.

CAP 6517
Computational   Genomics
DAY xx:xx – xx:xx
3 credits

Semester, Year
Prof. Raquel Assis
Office: EE 432
Office hours: TBD
Classroom: XXXX
Telephone: 561-297-3927
Email: rassis@fau.edu

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

Course Description

This course focuses on the computational analysis of modern high-throughput genomic data. In particular, the course will cover the application of R packages in performing exploratory data analysis, predictive modeling, and addressing questions about different types of genomic data.

Instructional Method

This class is designated as "In-Person w/Recorded Lecture" (section XXX) or "Videotaped Class" (section YYY). In-person class sessions will be automatically recorded and uploaded to Canvas within 24 hours. Student enrolled in section XXX may choose to attend in-person classes or view recordings, whereas students enrolled in section YYY are only able to view recordings.

Prerequisites/Corequisites

(COP 3035 and PCB 3063) or permission of instructor

Course Objectives/Student Learning Outcomes

In this course, students will:
1. Learn fundamental principles of genomics and computational data genomic analysis
2. Apply the R programming language to explore, model, and analyze different types of genomic data
3. Identify appropriate methods for addressing common questions using different types of genomic data

Course Evaluation Method

	Description	Weight
Four homework assignments	Hands-on data analysis in R	80% (20% each)
Final paper	Written report of data analysis project	20%

Course Grading Scale

Grade	Total (%)
A	[90 – 100]
A-	[87 – 90)
B+	[83 – 87)
B	[80 – 83)
B-	[77 – 80)
C+	[73 – 77)
C	[70 – 73)
C-	[67 – 70)
D+	[63 – 67)
D	[60 – 63)
D-	[51 – 60)
F	[0 – 51)

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

Late assignments will be graded with a penalty of 10% for each day after the due date, up to a maximum of 3 days late (*i.e.*, 30% penalty), beyond which they will receive a grade of 0 (zero).

Incomplete grades will only be given if there is solid evidence of a medical or otherwise serious emergency and the student is currently passing the class.

Classroom Etiquette Policy

Students are required to comply with all requirements specified in the student code of conduct and not in any way disrupt the class or prevent other students from benefiting from the class. Students are to speak and behave respectfully to each other and to all FAU faculty and staff.

Policy on the Recording of Lectures

Students enrolled in this course may record video or audio of class lectures for their own personal educational use. A class lecture is defined as a formal or methodical oral presentation as part of a university course intended to present information or teach students about a particular subject. Recording class activities other than class lectures, including but not limited to student presentations (whether individually or as part of a group), class discussion (except when incidental to and incorporated within a class lecture), labs, clinical presentations such as patient history, academic exercises involving student participation, test or examination administrations, field trips, and private conversations between students in the class or between a student and the lecturer, is prohibited. Recordings may not be used as a substitute for class

participation or class attendance and may not be published or shared without the written consent of the faculty member. Failure to adhere to these requirements may constitute a violation of the University's Student Code of Conduct and/or the Code of Academic Integrity.

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

Akalin Altuna. "Computational Genomics with R." 2020, Chapman and Hall. ISBN-13: 978-1498781855

** Free ebook: compgenomr.github.io

Course Topical Outline

1. Fundamentals of genomics (chapter 1)
2. Introduction to the R programming language (chapter 2)
3. Statistical inference in genomics (chapter 3)
4. Exploratory data analysis in genomics (chapter 4)
5. Predictive modeling in genomics (chapter 5)
6. Pre-processing and aligning high-throughput sequencing reads (chapter 7)
7. Assaying genomic variation with DNA-seq data (chapter 6)
8. Quantifying gene expression with RNA-seq data (chapter 8)
9. Identifying protein-DNA interactions with ChIP-seq data (chapter 9)
10. Analyzing DNA methylation with BS-seq data (chapter 10)
11. Genomic data management