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| <br><b>FLORIDA ATLANTIC UNIVERSITY</b>   | <b>NEW COURSE PROPOSAL</b><br><b>Graduate Programs</b>  |  | UGPC Approval _____<br>UFS Approval _____<br>SCNS Submittal _____<br>Confirmed _____<br>Banner _____<br>Catalog _____ |
|   | <b>Department Biomedical Science</b><br><br><b>College Medicine</b><br><i>(To obtain a course number, contact <a href="mailto:erudolph@fau.edu">erudolph@fau.edu</a>)</i>   |  |   |
| <b>Prefix</b> PCB<br><br><b>Number</b> 6667   | <i>(L = Lab Course; C = Combined Lecture/Lab; add if appropriate)</i><br><b>Lab Code</b>  | <b>Type of Course</b><br>Lecture   | <b>Course Title</b><br>Integrating Genomics into Predictive Health  |
| <b>Credits</b> <i>(Review Provost Memorandum)</i><br>3  | <b>Grading</b> <i>(Select One Option)</i><br><br><b>Regular</b> X<br><br><b>Sat/UnSat</b>   | <b>Course Description</b> <i>(Syllabus must be attached; see <a href="#">Guidelines</a>)</i><br><br>This graduate level course is taught by faculty leaders in genomics, precision medicine, and predictive health. The content covers all aspects of this rapidly evolving field from understanding the structure of the human genome, to exploring how natural genetic variation impacts human disease and health, to applying new technologies and tools across a wide range of clinical conditions including pre-conception screening, diagnostic testing, drug tailoring, and health forecasting. |   |
| <b>Effective Date</b> <i>(TERM &amp; YEAR)</i><br>Spring 2021   | <b>Prerequisites</b><br>Prerequisite for this course is at least one semester of human or medical genetics and permission of the instructors<br><br><i>Prerequisites, Corequisites and Registration Controls are enforced for all sections of course.</i> |  |   |
| <b>Prerequisites</b><br>Prerequisite for this course is at least one semester of human or medical genetics and permission of the instructors<br><br><i>Prerequisites, Corequisites and Registration Controls are enforced for all sections of course.</i> |   | <b>Academic Service Learning (ASL) course</b><br>Academic Service Learning statement must be indicated in syllabus and approval attached to this form.   |   |
|   |   | <b>Corequisites</b><br><br>NONE  | <b>Registration Controls</b> <i>(For example, Major, College, Level)</i><br><br>Instructor Permission Required        |
| <b>Minimum qualifications needed to teach course:</b><br>Member of the FAU graduate faculty and has a terminal degree in the subject area (or a closely related field.)   |   | <b>List textbook information in syllabus or here</b>   |   |
| <b>Faculty Contact/Email/Phone</b><br>Dr. Janet Robishaw jrobishaw@health.fau.edu<br>(561) 297-4399   |   | <b>List/Attach comments from departments affected by new course</b>  |   |

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| <b>Approved by</b><br>Department Chair <u>Janet D Robishaw</u><br>College Curriculum Chair <u>Marc Kantorow</u><br>College Dean <u>Philip M. Boyle, MD</u><br>UGPC Chair <u>Christopher Beetle</u><br>UGC Chair <u>Paul R. Peluso</u><br><small>Paul R. Peluso (Nov 18, 2020 08:43 EST)</small><br>Graduate College Dean <u>Robert W. Stanley</u><br>UFS President _____<br>Provost _____ | <b>Date</b><br>10/7/2020<br>10/7/2020<br>10/12/2020<br>Nov 17, 2020<br>Nov 18, 2020<br>Nov 18, 2020<br>_____<br>_____ |
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Email this form and syllabus to [UGPC@fau.edu](mailto:UGPC@fau.edu) 10 days before the UGPC meeting.

**FALL 2020 Capstone Course (3 credits) Integrating Genomics into Predictive Health PCB 6667**

**Tuesdays and Thursdays 3:30pm-4:50pm BC 314**

**Faculty Instructors (Drs. Gerda Breitwieser [gbreitwieser@health.fau.edu](mailto:gbreitwieser@health.fau.edu) and Janet Robishaw [jrobishaw@health.fau.edu](mailto:jrobishaw@health.fau.edu))**

**Course Requisites: Prerequisite for this course is at least one semester of human or medical genetics and permission of the instructors.**

**Textbook:** Precision Medicine, A Guide to Genomics in Clinical Practice”, by Jeanette J. McCarthy/Bryce A. Mendelsohn, McGraw Hill Education.

**Online Source:**

<http://ezproxy.fau.edu/login?url=https://accessmedicine.mhmedical.com/book.aspx?bookid=1930#140196890>

**It is strongly recommended that all students have a computer camera to improve the quality of remote instruction and faculty-student and peer interactions.**

**NOTE: Instructors will monitor software and bandwidth issues due to high levels of online teaching and may use additional software tools to teach live classes, but will generally use CANVAS and ZOOM. Students will be notified of potential changes at least 1 hr prior to class via their official FAU email address.**

**Overview**

This graduate level course is taught by faculty leaders in genomics, precision medicine, and predictive health. The content covers all aspects of this rapidly evolving field from understanding the structure of the human genome, to exploring how natural genetic variation impacts human disease and health, to applying new technologies and tools across a wide range of clinical conditions including pre-conception screening, diagnostic testing, drug tailoring, and health forecasting. In each context, the ethical, social, and legal challenges are discussed. To maximize content acquisition and practical application, each session uses a blended learning format by combining didactic lectures and interactive breakout sessions with online resources. Ultimately, completion of this course provides the foundational knowledge necessary for enrollment in advanced courses leading to the *Genomics and Predictive Health* certificate.

Prerequisite for this course is at least one semester of human or medical genetics and permission of the instructors.

## Course Objectives

Guided by scientists and clinicians working at the forefront of precision medicine, students will gain a better understanding of the human genome, genetic variants, pathogenic mechanisms, and practical applications in the context of human diseases:

1. Introduce concepts of precision medicine and predictive health;
2. Describe the organization of the human genome, modes of inheritance, types of variants, and considerations for interpretation;
3. Discuss new technologies and tools for detecting genetic variants;
4. Explain pathogenic mechanisms as they relate to monogenic and polygenic disorders;
5. Understand fundamental concepts in genetic epidemiology;
6. Demonstrate practical skills by selecting SNPs and performing genetic association analyses;
7. Describe importance of family history;
8. Discuss applications in preconception carrier screening, pregnancy, and newborn screening;
9. Understand applications in pharmacogenomics;
10. Describe applications in cancer predisposition testing and treatment decisions;
11. Gain awareness of emerging applications in predictive health and wellness;
12. Consider challenges and opportunities in precision medicine and predictive health through critical reading of primary literature and associated news trends.

## Instructional Format

Students will receive a blended learning format, including didactic lectures, assigned textbook readings, critical review of primary literature, and awareness of how this knowledge is presented in popular press. In response to COVID-19, the course will be taught in a fully online, synchronous format to deliver quality instruction in a safe environment. To gain a better understanding of challenges and opportunities in this exciting area, students will also hear from scientists and clinicians that work at the forefront of precision medicine. For assessment, students will demonstrate a comprehensive understanding of the material through class attendance and participation, homework assignments, journal article presentations, and formal testing. Throughout the course, the instructors are available for questions via posted office hours.

## Course Evaluation:

The grade in this course will reflect the following components: (1) Attendance, 10%; (2) Examinations, 50%; (3) Literature Discussions/Presentations, 30%; and (4) Application Projects, 10%. A (90-100%), B (80-89%), C (70-79%), D (60-69%), F (below 60%).

**Examinations:** There will be three in-class examinations during the semester, and a final examination at the conclusion of the course. Each exam will contain objective multiple-choice and short-answer questions. The purpose of these examinations is to assess your command of the material content that was covered in a particular unit.

**Literature Discussions/Presentations:** There will be a combined assessment to objectively gauge your ability to critically read primary literature and synthesize concepts into evidence-based insights. This will incorporate the following components: (1) Readiness and Applications Assessment that assess your understanding and synthesis of the assigned reading material (5%); (2) Oral presentations that will test your knowledge, organization, and communication skills (10%); and (3) Class participation that will assess your engagement, critical thinking and teamwork (15%).

**Application Projects:** There will be projects that apply what you have learned to create visionary clinical application(s) in the field of precision medicine (10%).

### **Part 1: Leveraging Genomic Variation for Discovery and Clinical Implementation (25%)**

#### **AUGUST 25, 2020**

1. Introductions/Syllabus Review
2. Interactive Discussion on “Genomics, Precision Medicine, & Predictive Health”  
(Robishaw/Breitwieser)

#### **AUGUST 27, 2020**

1. Interactive Discussion on “Exploring the Human Genome and Genetic Variation”  
(Breitwieser)
2. Paper#1 Presentation (Robishaw/Breitwieser)

**--AUGUST 28, 2020 LAST DAY TO DROP/ADD--**

#### **SEPTEMBER 1, 2020**

1. Further Discussion of the “Human Genome and Genetic Variation” (Robishaw/Breitwieser)
2. Interactive Discussion on “Laboratory Methods to Detect Genome Variation”  
(Robishaw/Breitwieser)

#### **SEPTEMBER 3, 2020**

1. Interactive Discussion on “Modes of Inheritance, Penetrance, Expressivity”  
(Robishaw/Breitwieser)
2. Paper#2 Presentation (Robishaw/Robishaw)
3. Discussion and sign-up for journal Paper presentations by students

**--SEPTEMBER 7, 2020 LABOR DAY--**

#### **SEPTEMBER 8, 2020**

1. Interactive Discussion on “Genetic Basis of Disease & Evidence” (Robishaw/Breitwieser)

### **SEPTEMBER 10, 2020**

1. Interactive Discussion on “Interpreting Pathogenicity of Genetic Variants”  
**(Robishaw/Breitwieser)**

### **SEPTEMBER 15, 2020**

1. Paper#3 Presentation (**students**)

### **SEPTEMBER 17, 2020**

1. Paper#4 Presentation (**students**)

### **SEPTEMBER 22-24, 2020**

1. Oral Presentations for Homework Problem Set#2

### **SEPTEMBER 29, 2020**

1. Wrap Up, Review, Questions (**Robishaw/Breitwieser**)

### **OCTOBER 1, 2020**

1. Test (15%)

### **Part 2: Ethics and Genetic Screening (15%)**

### **OCTOBER 6, 2020**

1. Interactive Discussion on “Bioethical Considerations” (**Robishaw/Breitwieser**)
2. Interactive Discussion on “Selecting & Ordering a Genetic Test” (**Robishaw/Breitwieser**)
3. Discuss and select partners for Project #1: “Debating Bioethics”, held October 15/20, 2020

### **OCTOBER 8, 2020**

1. Interactive Discussion on “Taking a Family History” (**Robishaw/Breitwieser**)
2. Interactive Discussion on “Preconception carrier screening and Pregnancy”  
**(Robishaw/Breitwieser)**

### **OCTOBER 13, 2020**

1. Paper#5 Presentation (**students**)

### **OCTOBER 15, 2020**

1. Oral Presentations: “Debating Bioethics”

### **OCTOBER 20, 2020**

1. Finish Oral Presentations: “Debating Bioethics”
2. Wrap Up, Review, Questions

### **OCTOBER 22, 2020**

1. Test (10%)

### **Part 3: Adulthood and Genetic Risk of Disease and Basis for Treatment (20%)**

#### **OCTOBER 27, 2020**

1. Interactive Discussion on “Pharmacogenomics” **(Robishaw/Breitwieser)**

#### **OCTOBER 29, 2020**

1. Interactive Discussion on “Cardiogenomics” **(Robishaw/Breitwieser)**

#### **NOVEMBER 3, 2020**

1. Paper #6 Presentation **(students)**

#### **NOVEMBER 5, 2020**

1. Paper #7 Presentation **(students)**

#### **NOVEMBER 10, 2020**

1. Interactive Discussion on “Cancer Genomics and Targeted Treatments” **(Robishaw/Breitwieser)**

#### **NOVEMBER 12, 2020**

1. Interactive Discussion on “Genomics in the Brain, and Health and Wellness” **(Robishaw/Breitwieser)**
2. Wrap Up, Review, Questions

#### **NOVEMBER 17, 2020**

1. Test (15%)

### **Part 4: Exploring the future of precision medicine**

#### **NOVEMBER 19, 2020**

1. Lecture on “Learning Healthcare Systems, Biobanks, and Discovery Research” **(Robishaw/Breitwieser)**
2. Discuss Project #3: Elevator Talks: Envisioning the Future of Precision Medicine /Elevator talks

#### **NOVEMBER 24, 2020**

1. Project #3 Presentations

**NOVEMBER 26-29, 2020 THANKSGIVING HOLIDAY-UNIVERSITY CLOSED**

#### **DECEMBER 1, 2020**

1. Project #3 Presentations

#### **DECEMBER 3, 2020**

1. Final Wrap Up, Review, Questions
2. Course Evaluation

**FINAL EXAM, Thursday December 10, 2020, 1:15-3:45 PM**

Final Exam (25%)

**DECEMBER 21, 2020 FINAL GRADES DUE**

### **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](#).

### **Respect for Diversity Statement**

This course aspires to create a learning environment in which students from diverse backgrounds are encouraged to contribute their perspectives. This diversity is viewed as a resource, strength and benefit to academic discussion. During this course, we intend to present materials and activities that are respectful of diversity whether gender identity, sexuality, disability, age, socioeconomic status, ethnicity, race, nationality, religion, or culture.

Given the sometimes sensitive and challenging nature of materials discussed in class, we promote an atmosphere of trust and safety in the classroom, where each class member shows respect for all views expressed in class. Because some course materials or readings may evoke strong emotions, please be aware of others' feelings and be cognizant of your own. If discomfort or offense is felt, we offer several ways to deal with negative experiences:

1. Discuss the situation privately with your instructors to find acceptable ways to process and address the issue;
2. Discuss the situation with your classmates to facilitate a fuller understanding of context and impact of class discussions on all participants;
3. If for any reason you do not feel comfortable discussing the issue directly with your instructors or peers, reach out to another academic advisor, a trusted faculty member, or a peer to communicate the information to your instructors.

### **Students With Disabilities**

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/](http://www.fau.edu/sas/).

### **Attendance Policy Statement**

Students are expected to satisfy all academic objectives as outlined by the instructors. Because class discussion is at the heart of this course, students are required to attend every class, as participation in class will determine a substantial portion of your grade. The effect of unexcused absences upon grades is determined by the instructors, and the University reserves the right to deal at any time with individual cases of 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/>.