

**RNA Biology and Genomics I**  
**CSAT 5024**  
**Spring 2021**

---

**CLASS DAYS and TIME:** Monday, Wednesday, & Friday, 8:30 AM – 9:50 AM (Classes begin April X, 2021)

**CLASSROOM:** ALTC 2.211

**COURSE FACULTY:** Luiz O. Penalva, Ph.D.

**OFFICE LOCATION and HOURS:** Contact Dr. Penalva and other instructors by email to schedule an appointment

**EMAIL:** [penalva@uthscsa.edu](mailto:penalva@uthscsa.edu)

**TELEPHONE:** 210-562-9049

---

**READ THIS DOCUMENT CAREFULLY - YOU ARE RESPONSIBLE FOR ITS CONTENTS.**

#### **COURSE DESCRIPTION AND OBJECTIVES**

(CSAT 5024), Spring Semester - This course coupled with the course, MMEDXXXX RNA Biology and Genomics II, covers the molecular mechanisms and physiological roles of post-transcriptional regulation of gene expression, such as mRNA splicing, alternative splicing, translation and RNA degradation and the function of RNA binding proteins and non-coding RNAs. Another important component of this course is how to employ omics methods such as RNA-seq, RIP-Seq, BRIC, CLIP, Ribo-seq, CRISPR to study these processes and regulators. Hands-on training on biological databases and classes covering examples of the use of genomics will be provided. We expect students to acquire skills that will help them visualize how genomics can be used in their own research project.

**Pre-requisites** – List any pre-requisites for the course

**Semester credit hours** – 1.0 Semester Credit Hour

By the end of this course, each student should be able to:

- Explain the principle and potential use of the latest genomic approaches for comprehensive analysis of gene expression.
- Employ latest omics methods in their own research.
- Understand the principles of RNA processing, localization, translation, decay, non-coding RNA.
- Explain how the post-transcriptional pathways discussed can be used in personalized molecular medicine approaches.

#### **COURSE ORGANIZATION**

**The main teaching modalities used in this course include:**

- 1) Didactic lectures on specific topics with the purpose of conveying important concepts.
- 2) Journal Clubs learning with students researching topics, reading the scientific literature, and leading discussions
- 3) Student presentations and discussion about specific topics and papers relevant to the fields.

**Materials** – Laptop for viewing the lecture notes and for reading scientific papers.

**Reading Assignments** – Course materials will be distributed to students via e-mail prior to class periods.

## **ATTENDANCE**

Attendance and participation are mandatory. One large component of the grading is class participation so if a student misses a class due to sickness, the student needs to inform the instructors and course directors as soon as possible since this may result in an incomplete for the student. Any scheduled absences must be approved by the course director prior to the absence.

## **TEXTBOOKS**

No required textbooks.

## **GRADING POLICIES AND EXAMINATION PROCEDURES**

Grades will be based on attendance, class participation, presentation and take home exam. Exam questions will be in the form of short answer and/or essay questions. Each faculty lecturer will be asked to provide 1-2 questions with all questions totaling 100 points.

### **Grading System**

A = 90-100%      B = 80-89%      C = 70-79%      F = < 69%

## **REQUESTS FOR ACCOMMODATIONS FOR DISABILITIES**

In accordance with policy 4.2.3, **Request for Accommodation Under the ADA and the ADA Amendments Act of 2008 (ADAAA)**, any student requesting accommodation must submit the appropriate request for accommodation under the American with Disabilities Act (ADA, form 100). to his/her appropriate Associate Dean of their School and a copy to the ADA Coordinator. Additional information may be obtained at <http://uthscsa.edu/eeo/request.asp>.

## **ACADEMIC INTEGRITY AND PROFESSIONALISM**

Any student who commits an act of academic dishonesty is subject to discipline as prescribed by the UT System Rules and Regulations of the Board of Regents. Academic dishonesty includes, but is not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an exam for another person, signing attendance sheets for another student, and any act designed to give unfair advantage to a student or the attempt to commit such an act. Additional information may be obtained at <http://catalog.uthscsa.edu/generalinformation/generalacademicpolicies/academicdishonestypolicy/>

## **TITLE IX AT UTHSCSA**

### **Title IX Defined:**

Title of the Education Amendments of 1972 is a federal law that prohibits sex discrimination in education. It reads “no person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance.”

### **University of Texas Health Science Center San Antonio’s Commitment:**

University of Texas Health Science Center San Antonio (UTHSCSA) is committed to maintaining a learning environment that is free from discriminatory conduct based on gender. As required by Title IX, UTHSCSA does not discriminate on the basis of sex in its education programs and activities, and it encourages any student, faculty, or staff member who thinks that he or she has been subjected to sex discrimination, sexual harassment (including sexual violence) or sexual misconduct to immediately report the incident to the Title IX Director.

In an emergency, victims of sexual abuse should call 911. For non-emergencies, they may contact UPD at 210-567-2800. Additional information may be obtained at <http://students.uthscsa.edu/titleix/>

#### **EMAIL POLICY**

Course information and instructions will be e-mailed to students. Additionally, students should communicate with the course director via e-mail.

#### **USE OF RECORDING DEVICES**

Prior approval from the presenter and instructor is required before use of recording devices during the lectures.

#### **ELECTRONIC DEVICES**

Cell phones shall not be used during class (unless requested to do so by the instructors.) Use of social media or email via any devices is not allowed during class.

**CSAT5024: RNA Biology and Genomics I**  
**Spring 2021 Schedule**  
Mondays, Wednesdays and Friday, 8:30-9:50  
ALTC 2.211

DATE	TOPIC	INSTRUCTOR	LOCATION
------	-------	------------	----------

**Lectures**

April XX	Intron and splicing	Luiz Penalva	
April XX	Alternative splicing	Luiz Penalva	
April XX	RBP Genomics	Luiz Penalva	
April XX	Journal Club: Exon Junction Complex	Luiz Penalva	
April XX	RNA and miRNA sequencing	Zhao Lai	
April XX	R-loops	Alexander Bishop	
April XX	Long non-coding RNA	Mingjiang Xu	
April XX	miRNA	Alexander Pertsemlidis	
May XX	Journal Club: CRISPR	Pei Wang	
May XX	mRNA decay	Masahiro Morita	

**Student presentation**

May XX	Presentation and discussion	Luiz Penalva, Masahiro Morita	
May XX	Presentation and discussion	Luiz Penalva, Masahiro Morita	