



# MCB6458: Post-translational Modifications in Microbiology

MARIOLA J FERRARO (EDELMANN)

UNIVERSITY OF FLORIDA



## RATIONALE FOR COURSE

The primary objective of this microbiology course is to enhance student learning while improving both team collaboration and individual writing skills. To achieve this, the course will employ an innovative approach to student learning through interactive group projects and proposal writing. The group projects will require students to synthesize published research findings while also encouraging them to think critically and "outside the box." In addition, the students will have a unique opportunity to learn the fundamentals of writing research proposals on post-translational modifications of proteins. By identifying gaps in knowledge that require further investigation, elaborating on their own research hypotheses, and designing experimental approaches, the students will gain valuable experience in developing and presenting their ideas. These research proposals will be evaluated based on their significance, innovation, impact, and scientific approach and rigor. Moreover, we hope that students will leverage the knowledge they acquire in the course to explore how post-translational modifications can be utilized to improve human health, food and agriculture, and natural resources. The course is intended to provide students with the skills and tools they need to achieve their professional goals. By mastering the art of proposal writing, students will gain a better understanding of their chosen field of study and be better prepared to pursue their own research ideas and projects in the future.

## INSTRUCTOR

**Mariola (Edelmann) Ferraro, Ph.D.**

**Contact information:** Email: [mjferraro@ufl.edu](mailto:mjferraro@ufl.edu)

Department: Microbiology and Cell Science

Office Location: Microbiology and Cell Science Building, 981 Museum Rd., Rm 1151

Office Hours: By appointment

Preferred method for communication with the instructor regarding the course is Canvas message or e-mail ([medelmann@ufl.edu](mailto:medelmann@ufl.edu))

Please resolve technical issues by contacting the UF helpdesk (e.g. <http://helpdesk.ufl.edu>; (352) 392-HELP (4357); [HELPDESK@ufl.edu](mailto:HELPDESK@ufl.edu) · HUB 132).

## DELIVERY METHOD/MEETING TIME:

All assignments, question/answer sessions, and other materials will be available online asynchronously. Class discussion and review sessions will be held in Canvas through 'conferences' for off-campus students to ask questions and interact with their instructor.

## CREDITS

2 credits

## COURSE DESCRIPTION

**Post-translational Modifications in Microbiology.** This course will cover the various types, functions, and mechanisms of post-translational modifications (PTMs) in microbiology. The curriculum will also include the methods used to identify PTMs and their impact on cell biology, human health, and biotechnology. Students will have the opportunity to synthesize existing literature and develop skills in writing a research proposal.

## COURSE OBJECTIVES/GOALS/LEARNING OUTCOMES

By the end of the students will be able to:

- Analyze the molecular and cellular biology of post-translational modifications (PTMs) using relevant literature
- Evaluate and interpret primary research articles that discuss PTMs, using critical thinking skills.
- Evaluate the role of PTMs in real-life applications such as controlling pathogenesis, engineering microbial biocatalysts in the production of renewable fuels and chemicals, or agricultural applications
- Demonstrate teamwork skills in completing a successful group project.
- Apply acquired skills in reviewing and scoring peer's projects.
- Formulate a central hypothesis related to PTMs, and develop research proposal

## COURSE MATERIAL AND ASSIGNMENTS

All required course materials will be available through the Canvas e-Learning site (<http://elearning.ufl.edu/>). Instructions for and submission of assignments will also be through Canvas.

Assignments/Quizzes	Points
Quiz 1	5 pts
Quiz 2	10 pts
Quiz 3	100 pts
Group project – division of work and 1-page draft of proposed project	25 pts

<b>Group project - preliminary list of references (5 references per student)</b>	20 pts
<b>Group project - final written report</b>	100 pts
<b>Individual project – research proposal</b>	100 pts
<b>Scientific peer evaluation</b>	100 pts
<b>Total:</b>	460 pts
<b>Extra credit (optional – resubmission of projects)</b>	25 pts

### WRITTEN GROUP PROJECT (100 POINTS FOR FINAL REPORT):

Through collaboration with classmates, students will engage in a written group project that involves gathering and synthesizing information on a specific type of post-translational modification occurring on proteins in ARCHAEA or BACTERIA (refer to the List of post-translational modifications for group projects). If assigned to focus on ubiquitin modifications in Eukaryota, the project should concentrate on post-translational modifications catalyzed by enzymes from bacterial pathogens. The project report should critically analyze research articles, identify knowledge gaps requiring further investigation, and propose innovative approaches to experimentally examine their research hypotheses.

#### ***List of possible post-translational modifications for group projects***

1. Phosphorylation
  - a. Arginine
  - b. Serine/Threonine and Tyrosine
  - c. Histidine and Aspartic Acid
2. ADP-ribosylation
3. Methylation
4. Glycosylation
5. Acetylation (N $\alpha$ - and N $\epsilon$ -acetylation)
6. Lipidation
7. S-Nitrosylation and S-Sulfhydration
8. S-Glutathionylation
9. Methionine oxidation – as a reversible process
10. Uridylation
11. Adenylation

12. Unique modifications of translation elongation factors (including attachment of ethanolamine phosphoglycerol, diphthamide and hypusine)
13. Ubiquitin-like modifications (sumoylation, pupylation)
14. Ubiquitin modification in Eukaryota catalyzed by bacterial (pathogen) enzymes
15. Targeted proteolysis (select a regulatory protease – e.g., Clp, Lon, Proteasome)
16. Specific polypeptide cleavage (e.g., removal of signal peptides)

The students will work collaboratively to gather, synthesize, and present information on a specific type of post-translational modification in microbiology, following the format outlined below. Templates for organizing the written portion of the group project are available in Excel and MS Word on the Canvas platform. The goal of the project is to provide students with the necessary skills to properly gather, synthesize, and write a comprehensive summary that conveys a complete understanding of the chosen post-translational modification.

The templates are designed to guide the student in developing an appropriate outline for the paper, adhering to the "Required Aspects of the Post-Translational Modification Paper" outlined below. The final report should be ~15 pages in length (not counting title page, figures, references, and tables!), with a title page, appropriate figures and tables, and three supplementary tables (1-3) that list the modified protein name, accession number, modified residue (including amino acid position if known), enzymes catalyzing the modification, and appropriate references. All references should be listed on separate pages, with no page limit. Font size should be 11 points, with 1-inch margins (smaller text is acceptable in figures, graphs, diagrams, and charts). The final report must be uploaded to Canvas e-Learning, and plagiarism will be checked through TurnItIn. Refer to the syllabus for details on the UF plagiarism policy. Each student will be graded individually based on their contributions to the project. All students must contribute to at least one of the Supplemental Tables, and their name must be listed for the portions of the written project to which they have contributed.

***Required aspects of the post-translational modification paper:***

1. **Title:**
2. **Student Names**, Department of Microbiology and Cell Science, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, Florida, USA.
3. **Sections:**

- I. Definition of the post-translational modification.
- II. Detailed chemistry of the modification.
- III. Overview of the attachment and removal of the post-translational modification from target proteins.

IV. Protein factors of the post-translational modification, including enzymes that catalyze the addition and removal of the modification. Summarize these factors in *Supplementary Table 1*.

V. General distribution and function of the post-translational modification among the three domains of life. For details on the distribution of protein homologs associated with the post-translational modification pathway, see *Supplementary Table 2*.

VI. Detailed list of known protein targets and affected residues. Compile this list from references x, y, and z, and summarize it in *Supplementary Table 3*.

VII. Biological function of the post-translational modification.

VIII. Methods used to detect and map the site(s) of the post-translational modification.

IX. Insight into how this post-translational modification may benefit human health, agriculture, and natural resources.

**4. References**

**5. Tables.** (be sure to state if table is original or include citation and a statement that the table is from a publication)

**6. Figures.** (be sure to state if figure is original or include citation and a statement that the figure is from a publication – extra points if you can make figures!)

*Supplementary Table 1:* Protein factors of the assigned post-translational modification pathway. This table should include the enzymes that add and remove the post-translational modification and the modification itself if it is a protein modifier (e.g., ubiquitin, SAMP, Pup).

*Supplementary Table 2.* Phylogenetic distribution of the protein factors of the assigned post-translational modification system.

*Supplementary Table 3.* Known protein targets and affected amino acid residues of the assigned post-translational modification pathway.

**Note:** Include page numbers at the bottom of each page of your project paper. Include initials or names by each section where each student contributed. By following these guidelines, it will be clear which sections of the project were contributed by each student. This will ensure proper documentation of each student's contribution and help with grading.

## OUTLINE OF RESEARCH PROPOSAL (100 POINTS):

Each student will write an individual research proposal based on the chosen modification, likely the one which was the subject of their group project, and use published papers as the basis for a novel grant/research proposal. Each proposal should be maximum 3 pages in length (plus additional pages for references) and consist of the following sections:

### **A. Introduction and Background**

- Describe the preliminary data from relevant literature and outline the major outstanding questions that arise from this work.

### **B. Significance**

- Discuss the importance of answering the stated questions and the potential clinical significance of the research.
- Describe how the proposed studies will advance scientific understanding and contribute to the field of medicine (or other fields).

### **C. Central Hypothesis**

- Formulate a clear and concise hypothesis based on the evidence presented in the Background and Significance sections.
- For example:

*Based on the evidence host-mediated Asparagine (Asn) hydroxylation of Legionella pneumophila effectors by host asparagine hydroxylase, FIH, is required for their functions in biogenesis of the Legionella-containing vacuole (LCV) and intracellular proliferation of Legionella pneumophila.*

### **D. Specific Aims.**

- Propose 2-3 specific aims that represent a series of experiments which will test aspects of the central hypothesis.
- Use clear and concise language and ensure that each aim is focused and achievable.
- For example, possible specific aims arising from the hypothesis stated above:

**Aim 1.** *Asn hydroxylation of AnkH effector and its role in the intracellular infection*

**Aim 2.** *Asn hydroxylation of AnkB effector and its role in the intracellular infection*

**Aim 3.** *Asn hydroxylation of other Legionella pneumophila effectors and its role in biogenesis of the Legionella-containing vacuole*

### **E. Research Design and Methods**

- Describe the experiments that will be performed in each aim and explain the logic behind the research design.
- Provide alternative approaches to address potential experimental failures.
- Clearly define the metrics that will be used to determine the success or failure of the proposal.

## Scientific Peer Evaluation of written project (100 points):

Each student will provide an independent scientific review (500-700 words) of one assigned project written by their peers. The review should include:

### **I. Introduction:**

Provide a brief summary of the modification studied in the project and its relevance to the field of study.

### **II. Evaluation:**

Evaluate the written project based on the following scientific criteria:

- a) Significance: Evaluate the significance of the research question, how well it has been defined, and its relevance to the field of study.
- b) Impact: Evaluate the potential impact of the research findings on the scientific community and society as a whole.
- c) Innovation: Evaluate the novelty and originality of the proposed research and how it builds upon existing knowledge.
- d) Approach and scientific rigor: Evaluate the experimental design, methodology, and data analysis, and the extent to which they are scientifically sound, rigorous, and appropriate for addressing the research question.

### **III. Conclusion:**

Summarize your evaluation of the written project and provide constructive feedback for improvement.

### **IV. Scoring:**

Provide scores (1 highest – 9 lowest) for each of the following criteria: significance, impact, innovation, and approach/scientific rigor. Justify your scores with scientific rationale and examples from the written project.

**Note: Focus on the scientific content and avoid commenting on the presentation style or grammar.**

## **EXAMPLES OF LITERATURE TO GET YOU STARTED.**

### **Overview**

- Cain JA, Solis N, Cordwell SJ. Beyond gene expression: The impact of protein post-translational modifications in bacteria. *J Proteomics*. 2013. doi: 10.1016/j.jprot.2013.08.012. PubMed PMID: 23994099.
- Eichler J, Maupin-Furlow J. Post-translation modification in Archaea: lessons from *Haloferax volcanii* and other haloarchaea. *FEMS Microbiol Rev*. 2013;37(4):583-606. doi: 10.1111/1574-6976.12012. PubMed PMID: 23167813; PMCID: PMC3593991.
- Bastos PA, da Costa JP, Vitorino R. A glimpse into the modulation of post-translational modifications of human-colonizing bacteria. *J Proteomics*. 2016;152:254-75. doi: 10.1016/j.jprot.2016.11.005. PubMed PMID: 27888141.

### **Phosphorylation**



- Esser D, Hoffmann L, Pham TK, Brasen C, Qiu W, Wright PC, Albers SV, Siebers B. Protein phosphorylation and its role in archaeal signal transduction. *FEMS Microbiol Rev.* 2016;40(5):625-47. doi: 10.1093/femsre/fuw020. PubMed PMID: 27476079; PMCID: PMC5007285.
- Trentini DB, Suskiewicz MJ, Heuck A, Kurzbauer R, Deszcz L, Mechtler K, Clausen T. Arginine phosphorylation marks proteins for degradation by a Clp protease. *Nature.* 2016;539(7627):48-53. doi: 10.1038/nature20122. PubMed PMID: 27749819.

### **Ubiquitin-like modifications (samylation, pupylation)**

- Maupin-Furlow JA. Prokaryotic ubiquitin-like protein modification. *Annu Rev Microbiol.* 2014;68:155-75. doi: 10.1146/annurev-micro-091313-103447. PubMed PMID: 24995873; PMCID: PMC4757901.

### **Acetylation (N $\alpha$ - and N $\epsilon$ -acetylation)**

- **Lysine:**
  - a. Ouidir T, Kentache T, Hardouin J. Protein lysine acetylation in bacteria: Current state of the art. *Proteomics.* 2016;16(2):301-9. doi: 10.1002/pmic.201500258. PubMed PMID: 26390373.
- **N-terminal modifications:**
  - a. Giglione C, Fieulaine S, Meinel T. N-terminal protein modifications: Bringing back into play the ribosome. *Biochimie.* 2015;114:134-46. doi: 10.1016/j.biochi.2014.11.008. PubMed PMID: 25450248.

### **Methylation**

- **Lysine:**
  - a. Lanouette S, Mongeon V, Figeys D, Couture JF. The functional diversity of protein lysine methylation. *Mol Syst Biol.* 2014;10:724. doi: 10.1002/msb.134974. PubMed PMID: 24714364; PMCID: PMC4023394.

### **Lipidation**

- Nakayama H, Kurokawa K, Lee BL. Lipoproteins in bacteria: structures and biosynthetic pathways. *FEBS J.* 2012;279(23):4247-68. doi: 10.1111/febs.12041. PubMed PMID: 23094979.

### **Glycosylation**

- Schaffer C, Messner P. Emerging facets of prokaryotic glycosylation. *FEMS Microbiol Rev.* 2016. doi: 10.1093/femsre/fuw036. PubMed PMID: 27566466.

### **Methionine oxidation – as a reversible process**

- Drazic A, Winter J. The physiological role of reversible methionine oxidation. *Biochim Biophys Acta.* 2014;1844(8):1367-82. doi: 10.1016/j.bbapap.2014.01.001. PubMed PMID: 24418392.

### **S-Nitrosylation and S-Sulfhydration**

- Lu C, Kavalier A, Lukyanov E, Gross SS. S-sulfhydration/desulfhydration and S-nitrosylation/denitrosylation: a common paradigm for gasotransmitter signaling by

H2S and NO. *Methods*. 2013;62(2):177-81. doi: 10.1016/j.ymeth.2013.05.020. PubMed PMID: 23811297; PMCID: PMC3923419.

### **S-Glutathionylation**

- Grek CL, Zhang J, Manevich Y, Townsend DM, Tew KD. Causes and consequences of cysteine S-glutathionylation. *J Biol Chem*. 2013;288(37):26497-504. doi: 10.1074/jbc.R113.461368. PubMed PMID: 23861399; PMCID: PMC3772197.

### **Uridylylation**

- Merrick M. Post-translational modification of P II signal transduction proteins. *Front Microbiol*. 2014;5:763. doi: 10.3389/fmicb.2014.00763. PubMed PMID: 25610437; PMCID: PMC4285133.

### **Adenylylation**

- Itzen A, Blankenfeldt W, Goody RS. Adenylylation: renaissance of a forgotten post-translational modification. *Trends Biochem Sci*. 2011;36(4):221-8. doi: 10.1016/j.tibs.2010.12.004. PubMed PMID: 21256032.

### **Unique modifications of translation elongation factors**

- Greganova E, Altmann M, Butikofer P. Unique modifications of translation elongation factors. *FEBS J*. 2011;278(15):2613-24. doi: 10.1111/j.1742-4658.2011.08199.x. PubMed PMID: 21624055.

### **Targets of regulated protein turnover by Clp, Lon, proteasome, etc.**

- Gur E. The Lon AAA+ protease. *Subcell Biochem*. 2013;66:35-51. doi: 10.1007/978-94-007-5940-4\_2. PubMed PMID: 23479436.

### **Specific polypeptide cleavage**

- Berry IJ, Steele JR, Padula MP, Djordjevic SP. The application of terminomics for the identification of protein start sites and proteoforms in bacteria. *Proteomics*. 2016;16(2):257-72. doi: 10.1002/pmic.201500319. PubMed PMID: 26442651.

## **WEEKLY COURSE SCHEDULE**

### Week 1 (5/15)

- introduce course objectives and syllabus
- Provide an example of an ideal group project
- Chat meeting with an instructor to answer any questions (5/15 10AM)
- **Quiz 1:** what do I know about proteins? (5 points for participation, not graded, 05/21)

### Week 2 (5/22)

- **Quiz 2:** syllabus content and example of ideal group project (10 points, 05/28)

- Overview of the different types of post-translational modifications found in bacteria and archaea – study the content of the module for Quiz 3 in week 3
- Assign students to group projects (based on student ability assessed by Quiz 1)
- Students work on group projects

#### Week 3 (5/29)

- **Quiz 3:** Overview of the different types of post-translational modifications found in bacteria and archaea (**100 points, deadline – 6/04**)
- Students work on group projects
- **Deliverable:** Group project – division of work and 1-page draft of the proposed document indicating division of work (**25 points, deadline – 6/04**)

#### Week 4 (6/05)

- Students work on group projects.
- **Deliverable:** Group project – at least five references per student (individual submissions please) related to group project (**20 points, deadline – 06/11**)

#### Week 5 (6/12)

- Students work on group projects.
- Identify subject for individual project due in week 9 (no submission needed)

#### Week 6 (6/19)

- **Deliverable:** Group project – students work on written report, written report due at the end of week (**deadline – 6/25**)
- Students work on individual projects.

#### Week 7 (6/26)

- **Summer break – no classes**
- Students may work on individual projects.

#### Week 8 (7/10)

- **Deliverable:** Individual project – research proposal due at end of week (**deadline - 07/16**)
- assignment of papers for peer-evaluation

#### Week 9 (7/17)

- scientific feedback from the instructor
- work on peer-evaluation

#### Week 10 (7/24)

- **Deliverable:** scientific peer evaluation of projects (**deadline - 07/25 – note the date!**)

#### Week 11 (7/31)

- Students work on modifying work based on recommendations.

#### Week 12 (8/7)

- **Deliverable (optional):** student modification of written report/proposals based on recommendations (resubmit by **8/9, 25 extra credit points**)

## EXAM DATES/CALENDAR/CRITICAL DATES AND DEADLINES

Quiz 1 **05/21**

Quiz 2 **05/28**

Quiz 3 **06/04**

Group project - division of work and 1-page draft of the proposed project **05/29**

Group project – preliminary list of references **06/05**

Group project - written report **6/25**

Individual project – research proposal **07/16**

Scientific peer evaluation - **07/25**

Resubmission – **08/9 (optional)**

## EVALUATION OF LEARNING/GRADES

5 points	Quiz 1
10 points	Quiz 2
100 points	Quiz 3
25 points	Group project - division of work and 1-page draft (in bullet points) of the proposed project
20 points	Group project – preliminary list of references
100 points	Group project - written report
100 points	Individual project – research proposal
<u>100 points</u>	Scientific peer evaluation

**460 points total**

+ 25 points optional (extra credit)

## MATERIALS AND SUPPLIES FEES

There are no additional fees for this course.

## GRADING POLICY

Final grades will be based on the following performance standard:

95 -100 %	= A
90 - 94.9 %	= A-
87 - 89.9 %	= B+
84 - 86.9 %	= B

80 - 83.9 %	= B-
77 - 79.9 %	= C+
74 - 76.9 %	= C
70 - 73.9 %	= C-
67 - 69.9 %	= D+
63 - 66.9 %	= D
60 - 62.9%	= D-
Less than 60.0 %	= E

More information on grades and grading policies is here:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

## CLASS ATTENDANCE AND MAKE-UP POLICY

Our class sessions are recorded for students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at:

<https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>.

## STUDENTS REQUIRING ACCOMMODATIONS

The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation: 0001 Reid Hall, 352-392-8565, <https://disability.ufl.edu>.

## CAMPUS HELPING RESOURCES

### Health and Wellness

*U Matter, We Care:* If you or someone you know is in distress,

please contact [umatter@ufl.edu](mailto:umatter@ufl.edu), 352-392-1575, or visit [U Matter, We Care website](#) to refer or report a concern and a team member will reach out to the student in distress.

*Counseling and Wellness Center:* [Visit the Counseling and Wellness Center website](#) or call 352-392-1575 for information on crisis services as well as non-crisis services.

*Student Health Care Center:* Call 352-392-1161 for 24/7 information to help you find the care you need, or [visit the Student Health Care Center website](#).

*University Police Department:* [Visit UF Police Department website](#) or call 352-392-1111 (or 9-1-1 for emergencies).

*UF Health Shands Emergency Room / Trauma Center:* For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road,

Gainesville, FL 32608; [Visit the UF Health Emergency Room and Trauma Center website](#).

*GatorWell Health Promotion Services:* For prevention services focused on optimal wellbeing, including Wellness Coaching for Academic Success, visit the [GatorWell website](#) or call 352-273-4450.

## **Academic Resources**

*E-learning technical support:* Contact the [UF Computing Help Desk](#) at 352-392-4357 or via e-mail at [helpdesk@ufl.edu](mailto:helpdesk@ufl.edu).

*Career Connections Center:* Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.

*Library Support:* Various ways to receive assistance with respect to using the libraries or finding resources.

*Teaching Center:* Broward Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring.

*Writing Studio:* 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.

*Student Complaints On-Campus:* [Visit the Student Honor Code and Student Conduct Code webpage for more information](#).

*On-Line Students Complaints:* [View the Distance Learning Student Complaint Process](#).

## **COURSE EVALUATION**

Students are expected to provide professional and respectful feedback on the quality of

instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

## UNIVERSITY HONESTY POLICY

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Conduct Code specifies a number of behaviors that are in violation of this code and the possible sanctions. [Click here to read the Conduct Code.](#) If you have any questions or concerns, please consult with the instructor or TAs in this class.

### In-Class Recording

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or guest lecturer during a class session.

Publication without the permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third-party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

## Online course support

A preferred method for resolving technical issues is to visit the helpdesk website or call 352-392-4357.