

# **BIG IDEAS IN BIOLOGY**

**BSC-1994-U01**

**Florida International University**

**Dept. of Biological Sciences**

**(SPRING 2018)**

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## **GENERAL INFORMATION**

### **PROFESSOR INFORMATION**

**Instructor:** Dr. Melissa McCartney

**Office:** OE-230

**Office Hours:** Tuesday from 10-11  
Wednesday from 10-11  
*If you can't make it to these hours please make an appointment via email*

**E-mail:** mmccartn@fiu.edu

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## **COURSE DESCRIPTION AND PURPOSE**

### **Why**

Biology is everywhere, it's everything. It is entrenched on every experience you live, embedded in every memory you have, rooted in every choice you make. No true understanding of the human experience is complete without biology. Biology is not an obscure idea, relegated to a dusty and outdated library hiding deep on the basement of an ancient university, nor is it only important to the sterile bright-white laboratories perched atop ivory towers. Biology is, in fact, the very visible, truly palpable, concrete matrix of our everyday life. Why do we get old and sick? Why do we get sad and angry? Why do we get excited and hungry? Is that safe to eat? Why does it taste so good? Why do we look like this? Why do we have hair? Why is this animal so scary? Why is it so dangerous? Why is this flower so beautiful? And why is it so rare? When we study biology we do not study "biology", we study our world, we study our life.

### **How**

Here, we will approach biology in a fundamentally different way, connecting biological ideas across multiple disciplines, scales, taxonomic groups, and historical events, all while highlighting their relationship with culture and society. We will tackle this goal by examining some of the most essential features of life, the connections between them, and the relationships between these processes and our everyday experience.

### **What**

The class will center on five themes: food, waste, conflict, senses, and information. Here you will understand the connections between these five themes, and how they are all forged and mediated by the major core concepts of biology (evolution, structure and function, information flow, transformation of energy and matter, and systems). The recurrence of the core concepts of biology within and across all five themes will help you gain a deeper understanding of biology as a scientific discipline, but also to truly grasp the importance of biology for our understanding of the world. Additionally, the current and future applications of biology will be explored, and the basic concept of abstract thinking and logical rationale behind the scientific process will be also introduced.

## COURSE CALENDAR

Month	Monday	Wednesday
Jan 2018	8 Thinking Science 1	10 Thinking Science 2
	15 MLK	17 Thinking Science 3
	22 Thinking Science 4	24 Thinking Science 5
	29 Thinking Biology 1	31 Thinking Biology 2
Feb 2018	5 First Exam	7 The core concepts of Biology
	12 Nat. Hist. of Food 1	14 Nat. Hist. of Food 2
	19 Nat. Hist. of Food 3	21 Nat. Hist. of Waste 1
	26 Nat. Hist. of Waste 2	28 Nat. Hist. of Waste 3
Mar 2018	5 Nat. Hist. of Conflict 1	7 Second Exam
	12 Spring Break	14 Spring Break
	19 Nat. Hist. of Conflict 2	21 Nat. Hist. of Conflict 3
	26 Nat. Hist. of the Senses 1	28 Nat. Hist. of the Senses 2
Apr 2018	2 GROUP PROJECT	4 GROUP PROJECT
	9 Nat. Hist. of Information 1	11 Nat. Hist. of Information 2
	16 Class Synthesis	18 Third Exam
	23 Finals Week	25 Final Exam

## COURSE OBJECTIVES

By the end of this course, students will be able to:

1. Illustrate the scientific process
2. Summarize the five core concepts of biology and how they interconnect
3. Summarize the seven core competencies of biology and how they interconnect
4. Identify the relationship between the 5 core concepts and the seven core competencies of biology
5. Reflect on the scientific effort behind our understanding of biology
6. Generate a description of how the field of biology relates to non-STEM fields

## HOW TO CONTACT ME

Please use email as much as possible: mmccartn@fiu.edu

## PROFESSIONAL CODE OF ETIQUETTE FOR ASKING QUESTIONS

In a professional environment, if you want to ask a question from someone at a higher level (supervisor, boss, professor, etc.), you should always try to go through the following steps **before** you ask the question. (1) Look for the answer yourself. (2) If you cannot find the answer, or you are unsure of the answer you found, ask a peer to see if he or she knows the answer. (3) If this does not answer the question, take a few minutes to make sure you know what exactly your question is and then ask someone at a higher level in a concise and specific manner. Following this etiquette shows everyone around you that (1) you have motivation and enterprise, (2) that you can work as a team member and value your peers. And most importantly, (3) you value everyone's time. All great qualities of a TRUE professional.

## **IMPORTANT INFORMATION**

### **STRONG RECOMMENDATIONS**

**Pen and Paper:** I highly, HIGHLY encourage you to take notes in class, not with a laptop or table, but with pen and paper. Vast number studies have showed that the multiple distractions omnipresent in multitasking devices will affect negatively your ability to comprehend and assimilate the information presented in class.

**PowerPoint presentations are not a replacement for coming to class:** PowerPoint presentations are not a comprehensive study guide, not they include all information presented in class, they are provided as a complement to your in-class notes (see above). Please, do not assume that having these presentations is a good replacement for attendance or note taking.

**Off-the-grid challenge:** In a world of instant information it is very hard for a lot of us to be “disconnected” from our families, friends, jobs, and all other current events. We will meet twice a week for a little more than one hour. I will take the off-the-grid challenge and disconnect for our classes in order to give you my undivided attention. I encourage you to challenge yourself to join me “outside of the grid”.

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## **POLICIES**

### **Rules, Policies, and Academic Misconduct**

A major objective of higher education is to develop self-reliance, critical thinking, problem solving, and creative thinking therefore, it is expected that students will be responsible for the completion of their own academic work. If appropriate, the use of literature, notes, aids, or assistance from other primary or secondary sources should be clearly identified and disclosed. In addition, students are expected to use all resources, including books, journals, and computers only in legal and authorized ways. They should also refrain from falsification of records, attend class as required, and participate in the educational process without disrupting the orderly processes and functions of the University. Students are expected to abide by the CODE OF ACADEMIC INTEGRITY (<http://integrity.fiu.edu/misconducts.html>).

It is the Responsibility of all students, faculty and administration to conduct all academic and scholarly activities in Truth which means the honest pursuit, generation, dissemination and application of knowledge. All students should respect the right of others to have an equitable opportunity to learn and honestly to demonstrate the quality of their learning. Therefore, all students are expected to adhere to a standard of academic conduct, which demonstrates respect for themselves, their fellow students, and the educational mission of Florida International University.

As a student of this university:

- I will be honest in my academic endeavors.
- I will not represent someone else's work as my own.
- I will not cheat, nor will I aid in another's cheating.

All students are deemed by the University to understand that if they are found responsible for academic misconduct, they will be subject to the Academic Misconduct procedures and sanctions.

### **Disability Notice**

There is a Disability Resource Center available to you should you need it. It is your responsibility to contact them to process your request to have your needs met. You must follow their procedures as to properly notify the instructor. Diversity Statement: The School of Journalism and Mass Communication (SJMC) fosters an environment of inclusivity and respect for diversity and multiculturalism. The SJMC educates students to embrace diversity and understand the root causes of discrimination, as well as social, ethnic, sexual, disability and gender-based exclusion.

### **Religious Holy Days**

The University's policy on religious holy days as stated in the University Catalog and Student Handbook will be followed in this class. Any student may request to be excused from class to observe a religious holy day of his or her faith.

### **Attendance & Participation**

Class attendance is essential for your understanding and comprehension of the course material. Given that this class in particular does not depend or follows a text book, attendance is mandatory.

### **Discrepancies**

In the event that there is a discrepancy with your grades – whether it was not posted with the rest of the class or if there are questions that you would like to review with your instructor – it is your responsibility to communicate with your instructor in a timely manner in order for changes to be made or office hours to be arranged.

### **Electronic Devices**

I discourage the use of any electronic devices including phones, laptops, and tablets to class. Please, if you must bring these devices to class, set all electronic devices, including cell phones, to silent mode so that they cannot be heard. Additionally, if you must take a call or text, please quietly leave the classroom to complete the discussion. Please, do not engage in texting inside the classroom.

## **COURSE DETAIL**

### **COURSE COMMUNICATION**

At the end of each lecture, by e-mail, and/or through appointments. See “How to contact me” section.

### **DISCUSSION FORUMS**

Keep in mind that your postings will likely be seen by other members of the course. Care should be taken when determining what to post.

### **ASSESSMENTS**

It is your responsibility to make sure your computer meets the minimum hardware requirements.

Assessments in this course are not compatible with mobile devices and should not be taken through a mobile phone or a tablet. If you need further assistance please contact FIU Online Support Services.

Please arrive on time to all exams; we will let anyone start an exam after the first exam has been turned in. There will be no make-up or replacement exams in this course. If you miss an exam, you may use the grade of your final exam to replace the missed exam grade. Please check within the first week of class the exam schedule as soon as possible for any conflicts with religious observances. If you must or have to miss the final exam, a valid and well-documented excuse must be presented.

### **ACADEMIC GRIEVANCE**

I aim to provide academic instruction in a way that is nondiscriminatory and fair to all students. Nevertheless, if you believe that you have not been dealt with fairly or that the instruction has been inadequate, procedures exist for handling grievances. First, speak with the instructor. I could be unaware that a problem exists and your grievance might help me make the class better for you and your fellow students. Speaking with the instructor is likely to yield a satisfactory explanation, or resolve the problem by making adjustments to accommodate special needs. Second, if the problem is not or cannot be resolved with the instructor, speak with the department head or chairperson. Finally, if the problem still cannot be resolved, speak with the Dean of Students.

Course Requirements	Number of Items	Points for Each	Total Points Available	Weight
Participation and Attendance	24	3	72	15%
Homework	3	50	150	15%
Group Project: Grant Panels	1	100	100	15%
Exams (3)	3	100	300	45%
Final (1)	1	100	100	10%
<b>Total</b>	<b>32</b>	<b>N/A</b>	<b>722</b>	<b>100%</b>

Letter	Range (%)	Letter	Range (%)	Letter	Range (%)
A	95 or above	B	83 - 86	C	70 - 76
A-	90 - 94	B-	80 - 82	D	60 - 69
B+	87 - 89	C+	77 - 79	F	59 or less

## DESCRIPTION OF REQUIREMENTS

**Participation and Attendance:** This will be an interactive class. For each class you can receive up to three points:

- 1 for being present
- 1 for participating in the discussion
- 1 for completing your exit slip

**Homework:** We will have three homework assignments throughout the semester. These will be written reports based on primary literature papers. In these reports you will be required to:

- Cite relevant primary literature
- Cartoon the experiments taking place
- Pitch the next experiment

**Group Project:** We will have one group project that will replicate a grant review panel. Groups will present current research on a topic of their choice and present their ideas for future experiments. Groups not presenting will be tasked with evaluating the proposed experiments and determining if they deserve funding.

**Exams:** We will have three in class exams that will be report-based. You will be allowed to use the internet to answer the questions but you must provide primary literature citations, and one of these citations must be from FIU-based research. If you do not finish the report in class you will be allowed to finish at home. If you do not attend class on exam days you will receive a zero and will not be allowed to finish at home.

**Final:** There will be a final report due at the end of the semester. The topics will be discussed during the course but will include describing how biology has influenced a non-STEM field.

## EXPECTATIONS OF THE COURSE

To master the major course objectives and topics listed in the course description. Students are also expected to attend class regularly and come to class on time. If you must be late, please enter the room in a way that does not disturb the lecture. No make-up examination will be given for the final exam, unless you can compellingly prove a very serious unavoidable event. It is in your best interest to print the slides prior to the lecture. This will help you follow more easily by not having to write down everything as I present the material. Attending all lectures and taking notes during said lectures is the best strategy to achieve success in this class.

## COURSE TEXT BOOK

This class will not follow a textbook chapter by chapter. Nevertheless, all concepts cover in this course can be found and reviewed in the textbook: Concepts of Biology (2017), Fowler, Roush, and Wise. This textbook is published by OpenStax and it is FREE in its electronic version at <https://openstax.org/details/books/concepts-biology>. Additionally, every learning unit will be accompanied by multiple primary literature readings that will be available to the students on the class website.