



**Biochemistry 104**  
**Molecular Mechanisms, Human Health and You**  
**Fall 2018**  
**Course credits: 3**

**Course Website:** <https://canvas.wisc.edu/courses/120645>

**Course Designations and Attributes**

Breadth - Biological Sci. counts toward the Natural Science requirement  
L&S credit - Counts as Liberal Arts and Science credit in L&S

**Meeting Time and Location**

MWF, 1:20 pm – 2:10 pm,  
Room 2131 Biochemistry Building,  
420 Henry Mall

Fall Instruction begins September 5th

Fall break is 11/22-11/25

Last class day is 12/12/2018

Final exam Friday, December 14<sup>th</sup>, 2:45-4:45 PM

Final exam location: TBA

**Instructional Mode**

Face-to-face with some online content

**Credit hour designation**

50 minutes of classroom or online instruction carries the expectation of a minimum of two hours of out of class student work for every class period over approximately 15 weeks. Additional information about expectations and optional learning opportunities for student work are included below.

## **INSTRUCTORS**

Dr. Richard Amasino, WF, 2:30 pm – 3:30 pm

215B DeLuca Biochemistry Laboratories, 433 Babcock Dr.,  
[amasino@biochem.wisc.edu](mailto:amasino@biochem.wisc.edu)

Dr. Mario Pennella , TR, 12:00 pm – 1:30 pm;

1142E DeLuca Biochemistry Building, 420 Henry Mall,  
[mpennella@wisc.edu](mailto:mpennella@wisc.edu)

## **OFFICIAL COURSE DESCRIPTION**

Students in this course will be introduced to how life works at the molecular level and the evolutionary path that led to the great diversity of life (including human) on our planet. With this foundation, we will discuss relevant topics such as diagnosing disease states, safety and efficacy of herbal medicines, the safety of genetically engineered foods and vaccines, insects evolving resistance to insecticides and bacteria evolving resistance to antibiotics, current techniques in biotechnology and the potential ethical issues of some of them such as DNA testing and gene-editing with CRISPR. A major goal of this course is equip students to explore and question science presented in the mainstream media.

### **Course Requisites**

None

## **LEARNING OUTCOMES**

1. Understand the nature of science and what science can tell us.
2. Gain an appreciation for the beauty of biology and the remarkable diversity of life on earth.
3. Discuss fundamentals of the evolutionary process and the molecular basis of how cells and organisms operate.
4. Appreciate the range of how science is presented and sometimes misrepresented in the media.
5. Equip students with the ability to inform their own decision making as they encounter scientific topics that may influence their daily life.

## **GRADING**

|  |             |
|--|-------------|
| Quizzes  | 60%         |
| Short assignments (in-class and/or outside of class) | 30%         |
| Final Exam   | 10%         |
| <b>Total</b>   | <b>100%</b> |

### **Grading Scale**

A = 90 – 100%

AB = 86 – 89.9%

B = 80 – 85.9%

BC = 76 – 79.9%

C = 65% – 75.9%

D = 55% – 64.9%

F= 0% – 54.9%

**Attendance is required** as grades on short assignments will depend on participation (turning in) those assignments. If you need to miss a class, please contact the Mario ([mpennella@wisc.edu](mailto:mpennella@wisc.edu)) to let him know.

## **REQUIRED TEXTBOOK, SOFTWARE & OTHER COURSE MATERIALS**

No formal textbook is required for this course. Course material (chapter excerpts, papers, websites, etc.) will be provided on the course website and/or in-class.

## **EXAMS, QUIZZES, & OTHER MAJOR GRADED WORK**

Most of the graded work will be quizzes and in-class activities during the semester. We have 6-7 topics listed below. There will be at least 6 quizzes. A quiz will be given at the end of each topic. Quizzes will be announced a week before. Due dates for assignments will be provided when they are assigned.

**Class Schedule – Fall 2018 – Biochemistry 104 (Tentative dates)**

**Quizzes will be in-class and at the end of the Unit. For example, quiz 1 would be 9/17. Quiz 2 would be 10/1 and etc.**

| <b>Dates</b>       | <b>Topic</b>   |
|--------------------|--|
| <b>9/5-9/14</b>    | <b>Process of science –discuss processes used by scientists: the scientific method, controls, and reproducibility. Students will learn about these processes and then apply them in class. Also discuss what is pseudoscience/anecdotes.</b> |
| <b>9/17-9/28</b>   | <b>Chemistry; metabolism; and energy – properties of atoms and water; carbohydrates as fuel for organisms; major macromolecules of the cell; energy flow</b>   |
| <b>10/1-10/12</b>  | <b>DNA and Biotechnology – We will discuss DNA, central dogma, and genes; Biotechnology – GMOs/Forensics/Others; Eugenics</b>  |
| <b>10/15-10/26</b> | <b>Immunity/Health/ Diseases/personalized medicine – discuss the immune system and vaccines; efficacy of personalized medicine to combat disease; genetic screening; gene editing</b>  |
| <b>10/29-11/21</b> | <b>Life and Evolution –discuss Darwin and natural selection; the mechanisms that can give rise to evolution; evidence of evolution; behavior and evolution; the origin and diversification</b>   |
| <b>11/22-11/25</b> | <b>Thanksgiving Break</b>  |
| <b>11/26-12/3</b>  | <b>Ecology/climate – population; ecosystems; biodiversity; fertilizer/ pesticides/herbicides; energy (fossil fuel) alternatives</b>  |
| <b>12/5-12/12</b>  | <b>Student choices</b>   |

## **RULES, RIGHTS & RESPONSIBILITIES**

- See the Guide's to [Rules, Rights and Responsibilities](#)

## **ACADEMIC INTEGRITY**

By enrolling in this course, each student assumes the responsibilities of an active participant in UW-Madison's community of scholars in which everyone's academic work and behavior are held to the highest academic integrity standards. Academic misconduct compromises the integrity of the university. Cheating, fabrication, plagiarism, unauthorized collaboration, and helping others commit these acts are examples of academic misconduct, which can result in disciplinary action. This includes but is not limited to failure on the assignment/course, disciplinary probation, or suspension. Substantial or repeated cases of misconduct will be forwarded to the Office of Student Conduct & Community Standards for additional review. For more information, refer to [studentconduct.wiscweb.wisc.edu/academic-integrity/](http://studentconduct.wiscweb.wisc.edu/academic-integrity/).

## **ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES**

**McBurney Disability Resource Center syllabus statement:** “The University of Wisconsin-Madison supports the right of all enrolled students to a full and equal educational opportunity. The Americans with Disabilities Act (ADA), Wisconsin State Statute (36.12), and UW-Madison policy (Faculty Document 1071) require that students with disabilities be reasonably accommodated in instruction and campus life. Reasonable accommodations for students with disabilities is a shared faculty and student responsibility. Students are expected to inform faculty [me] of their need for instructional accommodations by the end of the third week of the semester, or as soon as possible after a disability has been incurred or recognized. Faculty [I], will work either directly with the student [you] or in coordination with the McBurney Center to identify and provide reasonable instructional accommodations. Disability information, including instructional accommodations as part of a student's educational record, is confidential and protected under FERPA.” <http://mcburney.wisc.edu/facstaffother/faculty/syllabus.php>

## **DIVERSITY & INCLUSION**

**Institutional statement on diversity:** “Diversity is a source of strength, creativity, and innovation for UW-Madison. We value the contributions of each person and respect the profound ways their identity, culture, background, experience, status, abilities, and opinion enrich the university community. We commit ourselves to the pursuit of excellence in teaching, research, outreach, and diversity as inextricably linked goals.

The University of Wisconsin-Madison fulfills its public mission by creating a welcoming and inclusive community for people from every background – people who as students, faculty, and staff serve Wisconsin and the world.”

<https://diversity.wisc.edu/>