

1. Catalog Description – This is a three-credit introductory course of biology for a student in the engineering discipline. The contents of the course, including the basic knowledge of biological functions of human at the organ/tissue, cellular and molecular level, is designed for the student to prepare himself/herself to have the opportunity to develop their career in a bio-related engineering field.
2. Pre-requisites and Co-requisites – There are no pre-requisites and co-requisites for this course.
3. Course Objectives – This course aims to enable students to use an engineer’s point of view to understand basic biological concepts.
4. Contribution of course to meeting the professional component – This is an era that Engineers can apply their solid engineering training to much broader area, such as biomedical field, greatly. The course tries to expand the students’ discipline to enable students to apply the chemical engineering principles to biological and biomedical field.
5. Relationship of course to program outcomes – When finishing this course, the students will attain **1)** a knowledge of contemporary biological issues, **2)** the broad education necessary to understand the impact of engineering solution in current biological and biomedical research; and **3)** an ability to combine engineering and biological knowledge together to their career development.
6. Instructor: Yiider Tseng, PhD, Associate Professor of Chemical Engineering
  - a. Office location: 223 CHE (Chemical Engineering Building)
  - b. Telephone: (352) 392-0862
  - c. E-mail address: ytseng@che.ufl.edu
  - d. Web site: <http://www.che.ufl.edu/faculty/tseng/index.html>
  - e. Office hours: W3 (9:35 – 10:25) and F3, or special appointment by email
7. Teaching Assistant: Shenhsiu Hung, PhD graduate student of Chemical Engineering
  - a. Office location: 402 NSC (Nuclear Science Building)
  - b. Telephone: (352) 392-2985
  - c. E-mail address: shenhsiu@gmail.com
  - d. Office hours: F5-6 (11:45 – 13:40)
8. Meeting Times – This class will meet three times a week.
9. Class schedule: M4 (10:40 – 11:30), W4 and F4
10. Meeting Location: G186, MCCA (McCarty Hall A)
11. Material and Supply Fees: Not applicable
12. Textbooks and Software Required
  - a. Title: *Biology* (Pearson/Benjamin Cummings Publisher)
  - b. Authors: Campbell and Reece
  - c. Publication date and edition: 2008 as 8th Edition
  - d. ISBN number
    - ISBN-13: 978-0-8053-6844-4
    - ISBN-10: 0-8053-6844-2
13. Recommended Reading – Students are encouraged to actively acquire information from the Internet for related materials taught in the classes.

## 14. Course Outline

<b>TENTATIVE Schedule and Contents</b>		
<b>Wk</b>	<b>Date</b>	<b>Topics</b>
<b>1</b>	Aug. 22 Aug. 24 Aug. 26	<b>Course Overview and Organization</b> The materials and energy balances of animals Materials – food (digestive systems)
<b>2</b>	Aug. 29 Aug. 31 Sept. 2	Materials – gas (circulation systems I) Materials – gas (circulation systems II) Materials – water (excretory systems)
<b>3</b>	Sept. 5 Sept. 7 Sept. 9	<b>Labor Day – no classes</b> Overview of Exam I <b>Exam I (to Sept. 7)</b>
<b>4</b>	Sept. 12 Sept. 14 Sept. 16	An overview of biomolecules Energy – metabolism (biomolecules and enzyme) Energy – metabolism
<b>5</b>	Sept. 19 Sept. 21 Sept. 23	Energy – cellular respiration photosynthesis Energy – photosynthesis Energy - sensing (heat regulation: introduction of communication)
<b>6</b>	Sept. 26 Sept. 28 Sept. 30	Communication at the cellular level Communication at the organ and systems level Overview of Exam II
<b>7</b>	Oct. 3 Oct. 5 Oct. 7	<b>Exam II (to Sept. 26)</b> Communication with the outside world I Communication with the outside world II
<b>8</b>	Oct. 10 Oct. 12 Oct. 14	Body response to the outside world I (motor) Body response to the outside world II (cell mechanics) Overview of Exam III
<b>9</b>	Oct. 17 Oct. 19 Oct. 21	AIChE annual meeting ( <b>no classes</b> ) AIChE annual meeting ( <b>no classes</b> ) <b>Exam III (to Oct. 14)</b>
<b>10</b>	Oct. 24 Oct. 26 Oct. 28	Genetics – the cell cycle Genetics – Meiosis and meiosis Genetics – at the cell level
<b>11</b>	Oct. 31 Nov. 2 Nov. 4	Genetics – at the chromosome level Genetics – DNA and chromatin <b>Homecoming – no classes</b>
<b>12</b>	Nov. 7 Nov. 9 Nov. 11	Genetics – from DNA to proteins Animal development <b>Veterans Day – no classes</b>
<b>13</b>	Nov. 14 Nov. 16 Nov. 18	Overview of Exam IV <b>Exam IV (to Nov. 14)</b> Disease – viruses
<b>14</b>	Nov. 21 Nov. 23 Nov. 25	Disease – cancer Immunology and vaccine <b>Thanksgiving – no classes</b>
<b>15</b>	Nov. 28 Nov. 30 Dec. 2	Disease detection – PCR and electrophoresis Disease detection – clone and DNA sequencing Disease detection – immunoblotting
<b>16</b>	Dec. 5 Dec. 7	Overview of Exam V <b>Exam V (to Dec. 5)</b>

15. Attendance and Expectations – Since this class focuses to use engineers’ viewpoint to understand biology, the angle to view biology is different to the traditional way. Hence, students are expected to attend the classes. Absence from the lectures may lead to poorer performance in exam scores. A student is required to report a special event that causes his/her absence prior the class by email. Students are also expected to memorize some course materials; in particular when the instructor will make his best effort to reduce the memorization load from this course.
16. Grading – 20 % for each exam and a 4-page term paper which have a bonus of 0.2 pt out of your total score (term paper is due by Nov. 7, one month prior the final class day of the semester).
17. Grading Scale – The student’s final grade is determined by his/her averaged performance index (*PI*). The final *PI* is the sum of individual *PIs*, each is determined by one exam score using the following formula,  $PI = (x_i - \bar{x})/\sigma$ , where  $x_i$ ,  $\bar{x}$ , and  $\sigma$  represents individual student’s test score, the averaged test score of the class, and the standard deviation of that event, respectively. In general, a student will obtain an A, A-, B+, B, B-, C+, C, or C- grade if his/her *PI* value locates in the region,  $>0.8$ ,  $[0.4, 0.8]$ ,  $[0, 0.4]$ ,  $[-0.8, 0]$ ,  $[-1.2, -0.8]$ ,  $[-2, -1.2]$ ,  $[-3, -2]$ , or  $>-3$ , respectively.
- “A C- will not be a qualifying grade for critical tracking courses. In order to graduate, students must have an overall GPA and an upper-division GPA of 2.0 or better (C or better). Note: a C- average is equivalent to a GPA of 1.67, and therefore, it does not satisfy this graduation requirement. For more information on grades and grading policies, please visit: <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>
18. Make-up Exam Policy – There is NO make-up exam. In case of family emergency or illness, the student **needs to** provide official documentation for the absence. Then, the student’s performance index of the absent exam will be counted as the average of the rest *PIs* of the student.
19. Honesty Policy – All students admitted to the University of Florida have signed a statement of academic honesty committing themselves to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. This statement is a reminder to uphold your obligation as a UF student and to be honest in all work submitted and exams taken in this course and all others.
20. Accommodation for Students with Disabilities – Students Requesting classroom accommodation must first register with the Dean of Students Office. That office will provide the student with documentation that he/she must provide to the course instructor when requesting accommodation.
21. UF Counseling Services –Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:
- UF Counseling & Wellness Center, 3190 Radio Rd, 392-1575, psychological and psychiatric services.
  - Career Resource Center, Reitz Union, 392-1601, career and job search services.
22. Software Use – All faculty, staff and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

*Note: Statements in items 19-21, should be included as is.*