



SAINT LOUIS UNIVERSITY
MADRID

CHEM-3600-M01 Biochemistry

Spring 2018

Class Days and Time: TR 14:30-15:45

Classroom: PAH 24

Prerequisite(s): CHEM-2410

Credit(s): 3

Instructor: Tania de la Fuente

Instructor's Email: tania.delafuente@slu.edu

Instructor's Campus Phone: 91 554 58 58, ext. 268

Office: PAH-204

Office Hours: TR 12:00 - 13:00, or by appointment

Course Description:

This course will examine the fundamental of biochemistry from a chemistry point of view. Students are expected to have completed and have a good working knowledge of general chemistry and 1st semester organic chemistry. By the end of the semester, you will have a strong overview of the biochemical mechanisms. Students will be exposed to basic structures of biomolecules, structure and function of proteins, enzyme kinetics, metabolic pathways and energy utilization and nucleic acids and information transfer.

Course Goals and Student Learning Outcomes:

Objectives

- a. define biochemistry
- b. identify the five classes of polymeric biomolecules and their monomeric building blocks name organic compounds.
- c. explain the specificity of enzymes (biochemical catalysts), and the chemistry involved in enzyme action.
- d. describe DNA replication, RNA and protein synthesis
- e. explain how protein synthesis can be controlled at the level of transcription and translation.

Chemistry Program Objectives

- A. Students will identify the principles of modern chemistry and demonstrate their application to a range of common systems. This includes:
1. Being able to perform quantitative calculations using experimental data.
 2. Explain the physical and chemical properties of substances based on an understanding of atomic, molecular and supermolecular structure.
 3. Connect observations with prior information, this includes prediction and identification of chemical/biochemical reaction products.

Student Learning Outcomes:

| Program Objectives | Student Learning Outcomes | Assessment Method |
|--------------------|---|---|
| A | <ol style="list-style-type: none">1. define biochemistry2. identify the five classes of polymeric biomolecules and their monomeric building blocks name organic compounds.3. explain the specificity of enzymes (biochemical catalysts), and the chemistry involved in enzyme action.4. describe DNA replication.5. describe RNA replication.6. protein synthesis.7. explain how protein synthesis can be controlled at the level of transcription and translation. | Exams, quizzes, homework and Final exam |

Saint Louis University - Madrid Campus is committed to excellent and innovative educational practices. In order to maintain quality academic offerings and to conform to relevant accreditation requirements, the Campus regularly assesses its teaching, services, and programs for evidence of student learning outcomes achievement. For this purpose anonymized representative examples of student work from all courses and programs is kept on file, such as assignments, papers, exams, portfolios, and results from student surveys, focus groups, and reflective exercises. *Thus, copies of student work for this course, including written assignments, in-class exercises, and exams may be kept on file for institutional research, assessment and accreditation purposes.* If students prefer that Saint Louis University - Madrid Campus does not keep their work on file, they need to communicate their decision in writing to the professor.

Required Texts and Materials:

Textbook: Biochemistry, Concepts and Connections. Appling, D.R.; Anthony-Cahill, S.J.; Mathews, C. K.

Biochemistry, Voet and Voet (optional)

Attendance Policy:

You are expected to attend all classes. Most students in the past have found the lectures to be helpful. If you absolutely must miss a class, it is your responsibility to get all information and material covered from your fellow students.

Students who legitimately miss an exam, due to a doctor's visit or family emergency **must provide written documentation** of the circumstances, and will be allowed to take a make-up exam. A letter from the university counselor is accepted. Exams that are missed illegitimately result in a score of F. Grades for these students will be based on the remaining exams. Missing more than one exam will result in an F final grade.

Class Behavior: The difficulty of the subject demands that we show special consideration for one another. Please make every effort to arrive on time. If you must be late or leave early, please close the door quietly and sit near the exit. Please be courteous of those around you and keep chit chat to a minimum. Cellular phones should be silenced or turned off before lectures begin. On the rare chance you have forgotten and your phone sounds during class, be polite and turn it off immediately. If you are expecting an urgent call, please seat yourself near the exit. Students who are surfing the web, texting or reading the newspaper can be asked to leave.

End of Semester Travel Plans: **DO NOT** make plans to leave SLU before the last day of the final exams. Tell your parents **NOT** to make reservations before that date. If plans have already been made, *change them now!!*

Course Requirements and Grading Rationale/System:

First Exam: 20%

Second Exam: 20%

Third Exam: 20%

Final Exam: 25%

Homework: 5%

Quizzes and projects: 10%

Grading scale:

100% < A < 93%

92% < A- < 90%

90% < B+ < 87%

86% < B < 83%

82% < B- < 80%

79% < C+ < 77%

76% < C < 73%

72% < C- < 70%

69% < D < 60%

F < 60%

Spring Course Content:

1. Biochemistry and the Language of Chemistry, Chapter 1
2. The Chemical Foundation of Life: Weak interactions in an Aqueous Environment, Chapter 2
3. The Energetics of Life, Chapter 3
4. Protein Structure and Function , Chapter 5, 6 and 7
5. Enzymes, Chapter 8
6. Carbohydrates, Chapters 9
7. Lipids, Chapter 10
8. Intro to Metabolism, Chapter 11
9. Carbohydrate Metabolism, Chapter 12
10. The Citric Acid Cycle, Chapters 13
11. Electron Transport, Chapter 14
12. Lipid Metabolism, Chapter 16
13. Energy use, Chapter 17
14. Amino Acid and Nucleotide Metabolism, Chapter 19
15. Signal Transduction, Chapter 20
16. DNA and RNA, Chapter 22

| Week | Topic | Chapter |
|-------------|---|----------------|
| 1 | Introduction and Cells | 1 |
| 2 | pH and Amino Acids | 2, 3 & 5 |
| 3 | Polar Covalent Bonds, Acids and Bases | 6 |
| 3 | Last day to drop without a W and to choose AU or P/NP options Jan 21 | |
| 4 | Protein Structure and Function | 7 |
| 5 | Enzymes | 8 |
| 5 | First Exam Jan. 30 | |
| 6 | Carbohydrates and Metabolism | 9 & 11 |
| 7 | Glycolysis | 12 |
| 8 | No Classes –Feb. 22-23 | |
| 8 | TCA Cycle | 13 |
| 9 | Second Exam Feb. 27 | |

| | | |
|-------------|--|-------------|
| 9 | Electron Transport Chain | 14 |
| 10 | Last day to Drop a class with a W March 9 | |
| 10 | Gluconeogenesis/Pentose Phosphate | 12 & 10 |
| 11 | Lipid Metabolism | 16 |
| 12 | Third Exam March 20 | |
| 12 | Energy use | 17 |
| 13 | Easter Break March 23-30 | |
| 14 | Signal Transduction | 20 |
| 15 | Nucleotide Metabolism | 19 |
| 16, 17 & 18 | RNA & Ribosome | 19, 21 & 22 |
| 18 | No Classes –May 1-2 | |
| | <i>FINAL EXAM May 8, at 12:00-15:00</i> | |

Tentative course outline. Any information on changes regarding the course content will be communicated to students in advance

Quizzes and Homework: Working problems outside of class are an important and expected activity in the mastery of chemistry. Announced and/or impromptu **quizzes** will be given in class **and will count towards your final grade**. Regular **homework assignments** will be given; late homework will not be accepted and will result in a grade of zero for that assignment. These are expected to be a measurement tool for you to chart your progress and to identify your deficiencies and to give you a feel of the upcoming tests. **Homework will count towards your final grade.**

Examination Dates:

Exam #1 – Tuesday, Jan. 30th (during class hour)

Exam #2 – Tuesday, Feb. 27th (during class hour)

Exam #3 – Tuesday, March 20th (during class hour)

Final Exam –Tuesday, May 8th (12:00 – 15:00)

E-mail: Campus and course announcements will often be handled by e-mail. Students should check their “@slu.edu” e-mail regularly.

University Statement on Academic Integrity: Academic integrity is honest, truthful and responsible conduct in all academic endeavors. The mission of Saint Louis University is "the pursuit of truth for the greater glory of God and for the service of humanity." Accordingly, all acts of falsehood demean and compromise the corporate endeavors of teaching, research, health care and community service via which SLU embodies its mission. The University strives to prepare students for lives of personal and professional integrity, and therefore regards all breaches of academic integrity as matters of serious concern.

The governing University-level Academic Integrity Policy can be accessed on the Provost's Office [website](#) at: Additionally, SLU-Madrid has posted its academic integrity policy online: <http://www.slu.edu/madrid/academics>. As a member of the University community, you are expected to know and abide by these policies, which detail definitions of violations, processes for reporting violations, sanctions and appeals.

The professor will review these matters during the first weeks of the term. Please direct questions about any facet of academic integrity to your faculty, the chair of the department of your academic program or the Academic Dean of the Madrid Campus.

University Title IX Statement: Saint Louis University and its faculty are committed to supporting our students and seeking an environment that is free of bias, discrimination, and harassment. If you have encountered any form of sexual misconduct (e.g. sexual assault, sexual harassment, stalking, domestic or dating violence), we encourage you to report this to the University. If you speak with a faculty member about an incident of misconduct, that faculty member must notify SLU's Title IX deputy coordinator, Marta Maruri, whose office is located on the ground floor of Padre Rubio Hall, Avenida del Valle, 28 (mmaruri@slu.edu; 915-54-5858, ext. 213) and share the basic fact of your experience with her. The Title IX deputy coordinator will then be available to assist you in understanding all of your options and in connecting you with all possible resources on and off campus.

If you wish to speak with a confidential source, you may contact the counselors at the SLU-Madrid's Counseling Services on the third floor of San Ignacio Hall (counselingcenter-madrid@slu.edu; 915-54-5858, ext. 230) or Sinews Multipletherapy Institute, the off-campus provider of counseling services for SLU-Madrid (www.sinews.es; 917-00-1979). To view SLU-Madrid's sexual misconduct policy and for resources, please visit the following web address: <http://www.slu.edu/Documents/Madrid/campus-life/SLUMadridSexualMisconductPolicy.pdf>.

Students with Special Needs: In recognition that people learn in a variety of ways and that learning is influenced by multiple factors (e.g., prior experience, study skills, learning disability), resources to support student success are available on campus. Students who think they might benefit from these resources can find out more about:

- Course-level support (e.g., faculty member, departmental resources, etc.) by asking your course instructor.
- University-level support (e.g., tutoring/writing services, Disability Services) by visiting the Academic Dean's Office (San Ignacio Hall) or by going to <http://www.slu.edu/madrid/learning-resources>.

Students with a documented disability who wish to request academic accommodations must contact Disability Services to discuss accommodation requests and eligibility requirements. Once successfully registered, the student also must notify the course instructor that they wish to access accommodations in

the course. Please contact Disability Services at disabilityservices-madrid@slu.edu or +915 54 58 58, ext. 230 for an appointment. Confidentiality will be observed in all inquiries. Once approved, information about the student's eligibility for academic accommodations will be shared with course instructors via email from Disability Services. For more information about academic accommodations, see "Student Resources" on the SLU-Madrid webpage.

Note: Students who do not have a documented disability but who think they may have one are encouraged to contact Disability Services.

Spring 2018 Course Schedule:

| JANUARY | |
|-----------------|---|
| Wednesday 10 | First Day of Classes |
| Sunday 21 | Last Day to Drop a Class without a Grade W and/or Add a Class; Last Day to Choose Audit (AU) or Pass/No Pass (P/NP) Options |
| Friday 26 | No Classes Application Deadline for Spring Semester Degree Candidates |
| FEBRUARY | |
| Wednesday 14 | Ash Wednesday Registration for Summer 2018 Begins |
| Thursday 22 | No Classes (Winter Break) |
| Friday 23 | |
| Tuesday 27 | Professors' Deadline to Submit Midterm Grades |
| MARCH | |
| Friday 9 | Last Day to Drop a Class and Receive a Grade of W |
| Thursday 15 | Last Day to Submit Transfer Application for Fall Semester |
| Monday 26 | <i>Semana Santa</i> Holiday (Campus Closed) |
| Tuesday 27 | |
| Wednesday 28 | |
| Thursday 29 | <i>Jueves Santo</i> (Campus Closed) |
| Friday 30 | <i>Viernes Santo</i> (Campus Closed) |
| APRIL | |
| Wednesday 4 | Registration for Fall 2018 Semester Begins |
| MAY | |
| Tuesday 1 | <i>Día del Trabajador</i> (Campus Closed) |
| Wednesday 2 | <i>Día de la Comunidad</i> (Campus Closed) |
| Thursday 3 | Spring 2018 Final Day of Classes |
| Friday 4 | Spring 2018 Final Exams |
| Monday 7 | |
| Tuesday 8 | |
| Wednesday 9 | |
| Thursday 10 | |
| Friday 11 | University Housing Move-out Date |
| Saturday 12 | Commencement |
| Sunday 13 | Professors' deadline to submit spring 2018 final grades |

Final Exam Schedules Spring 2018

| | 4 May (Fr) | 7 May (Mn) | 8 May (Tu) | 9 May (Wd) | 10 May (Th) |
|--------------------|-------------------------------------|-------------------------------|---------------------------------------|------------------------------|------------------------------|
| 08:30-11:30 | Mn classes that meet at 9:00 & 9:30 | Mn classes that meet at 10:00 | Mn classes that meet at 11:00 & 11:30 | Tu classes that meet at 9:30 | Tu classes that meet at 8:00 |

| | | | | | |
|--------------------|-------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|-------------------------------|
| 12:00-15:00 | Tu classes that meet at 11:00 | Mn classes that meet at 13:00 | Tu classes that meet at 14:30 | Mn classes that meet at 12:00 & 12:30 | Tu classes that meet at 12:30 |
| 15:30-18:30 | Mn classes that meet at 14:30 | Tu classes that meet at 17:00 & 17:30 | Mn classes that meet at 16:00 | Tu classes that meet at 16:00 | Mn classes that meet at 17:30 |
| 19:00-22:00 | --- | --- | Mn classes that meet at 18:30 & 19:00 | Tu classes that meet at 19:00 | --- |