

# BIOL240

**STUDENT WARNING:** This course syllabus is from a previous semester archive and serves only as a preparatory reference. Please use this syllabus as a reference only until the professor opens the classroom and you have access to the updated course syllabus. Please do NOT purchase any books or start any work based on this syllabus; this syllabus may NOT be the one that your individual instructor uses for a course that has not yet started. If you need to verify course textbooks, please refer to the online course description through your student portal. This syllabus is proprietary material of APUS.

## Course Summary

**Course :** BIOL240 **Title :** Elements of Biological Chemistry

**Length of Course :** 8

**Prerequisites :** BIOL134, CHEM134 **Credit Hours :** 3

## Description

**Course Description:** This course introduces students to the fundamental principles associated with the structure and function of the macromolecules that sustain living systems. The course will begin with a general introduction to organic chemistry including the molecules and functional groups that set this category of chemistry apart from the others. Topics will then move on to more specific molecules such as carbohydrates, lipids, proteins and nucleic acids along with the cellular processes involved in building and metabolizing these macromolecules. Additional details regarding biology at the cellular and molecular level will include topics such as nutrition, body fluids, pH and cellular respiration. Prerequisite: CHEM134 and BIOL134

### Course Scope:

This course introduces students to the principles of biological chemistry, including the nomenclature, terminology, methodology and worldview of biochemistry, and the practical application to everyday living. Topics are both descriptive and literal and include an introduction to organic chemistry and the related functional groups, a detailed description of macromolecules including carbohydrates, lipids, proteins and nucleic acids and their corresponding metabolic reactions and pathways as well as the role of body fluids and micronutrients in maintaining cellular health. Additional topics include relevant and cutting edge biotechnologies.

## Objectives

The successful student will fulfill the following learning objectives, and upon completion of this course, should be able to:

**CO-1** List and apply the principles, history, and terminology of organic and biochemistry.

**CO-2** Distinguish between classes and behaviors of organic functional groups.

**CO-3** Identify and describe the macromolecules involved in sustaining life (carbohydrates, lipids, proteins, enzymes, nucleic acids).

**CO-4** List the basic functions of biochemical micronutrients (vitamins and minerals).

**CO-5** Describe some of the important reactions of metabolism and the Central Dogma of biochemistry.

**CO-6** Differentiate between expected reactions of biomolecules based on cellular needs and the various

molecular concepts of normal and abnormal cellular function.

**CO-7** Describe the importance of body fluids and the special role of water in biochemical systems.

**CO-8** Apply the concepts of organic and biochemistry to the study of drugs, drug interactions and other relevant biotechnologies.

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## Outline

### **Week 1: Alkanes, Alkenes, Alkynes, Aromatics, Aliphatics, Isomers, and Polymers**

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Learning Objectives

CO-1; CO-2; CO-8

Reading/Viewing

#### **Syllabus**

#### **Academic Honor Pledge**

**Text:** Chapters 1 & 2

**Supplemental Media/Content:** See links within Lesson 1

Assignments (Due date ends at 11:59 pm Eastern Time)

#### **Due by Wednesday:**

\*Forum 1 Primary Posts (also includes topic for Course Project)

#### **Due by Sunday:**

\*Academic Honor Pledge

\*Forum 1 replies

\*Homework Quiz 1

### **Week 2: Alcohols, Phenols, Ethers, Aldehydes, and Ketones**

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Learning Objectives

CO-2; CO-8

Reading/Viewing

**Text:** Chapters 3 & 4

**Supplemental Media/Content:** See links within Lesson 2

Assignments (Due date ends at 11:59 pm Eastern Time)

#### **Due by Wednesday:**

\*Forum 2 Primary Posts

#### **Due by Sunday:**

\*Forum 2 replies

\*Homework Quiz 2

\*Test 1

### Week 3: Carboxylic Acids, Esters, Amines, and Amides

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Learning Objectives

CO-2; CO-8

Reading/Viewing

**Text:** Chapters 5 & 6

**Supplemental Media/Content:** See links within Lesson 3

Assignments (Due date ends at 11:59 pm Eastern Time)

**Due by Wednesday:**

\*Forum 3 Primary Posts

**Due by Sunday:**

\*Forum 3 replies

\*Homework Quiz 3

\*Course Project: *Client Profile*

### Week 4: Carbohydrates and Lipids

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Learning Objectives

CO-3; CO-8

Reading/Viewing

**Text:** Chapters 7 & 8

**Supplemental Media/Content:** See links within Lesson 4

Assignments (Due date ends at 11:59 pm Eastern Time)

**Due by Wednesday:**

\*Forum 4 Primary Posts

**Due by Sunday:**

\*Forum 4 replies

\*Homework Quiz 4

\*Test 2

### Week 5: Proteins and Enzymes

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Learning Objectives

CO-3; CO-8

Reading/Viewing

**Text:** Chapters 9 & 10

**Supplemental Media/Content:** See links within Lesson 5

Assignments (Due date ends at 11:59 pm Eastern Time)

**Due by Wednesday:**

\*Forum 5 Primary Posts

**Due by Sunday:**

\*Forum 5 replies

\*Homework Quiz 5

\*Course Project: *Nutritional Analysis*

**Week 6: Nucleic Acids, Protein Synthesis, Nutrition, and Energy for Life**

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Learning Objectives

CO-3; CO-4; CO-8

Reading/Viewing

**Text:** Chapters 11 & 12

**Supplemental Media/Content:** See links within Lesson 6

Assignments (Due date ends at 11:59 pm Eastern Time)

**Due by Wednesday:**

\*Forum 6 Primary Posts

**Due by Sunday:**

\*Forum 6 replies

\*Homework Quiz 6

\*Test 3

\*Course Project: *Dietary Recommendation*

**Week 7: Carbohydrate Metabolism**

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Learning Objectives

CO-3; CO-5; CO-6; CO-8

Reading/Viewing

**Text:** Chapter 13

**Supplemental Media/Content:** See links within Lesson 7

Assignments (Due date ends at 11:59 pm Eastern Time)

**Due by Wednesday:**

\*Forum 7 Primary Posts

**Due by Sunday:**

\*Forum 7 replies

\*Homework Quiz 7

\*Course Project: *Multimedia Presentation*

**Week 8: Lipid Metabolism, Amino Acid Metabolism, and Body Fluids**

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Learning Objectives

CO-3; CO-5; CO-6; CO-7; CO-8

Reading/Viewing

**Text:** Chapters 14 & 15

**Supplemental Media/Content:** See links within Lesson 8

Assignments (Due date ends at 11:59 pm Eastern Time)

**Due by Wednesday:**

\*Forum 8 Primary Posts

**Due by Sunday:**

\*Forum 8 replies

\*Homework Quiz 8

\*Test 4

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## Evaluation

Four types of graded assessments/activities will be assigned to enhance your understanding of biological chemistry principles. Participation in all of the activities is essential for developing problem solving skills and concepts presented in the course. Your course grade is based on your performance on the following activities:

### **Discussion Forums (20%):**

You are to post a thoughtful post(s) after reading the instructions for each forum topic, expressing critical thought and analysis. You are then required to post a response to the post of at least **2** of your classmates as well. There will be a total of 8 discussion forums, each worth 2.5% of your course grade (thus, discussion forums collectively make up 20% of your grade in this course). **Please** do not plagiarize your answer (i.e. do not copy paste directly from the internet or any other source) or you will not receive credit. There are many tools available for instructors to help catch this, so please don't try it.

*NOTE: Brief statements, saying something very vague, or congratulatory or acknowledgement-type postings will not count towards adequate participation credit. They do not contribute to an understanding of the material, raise important issues regarding the material, or forward the conversation about the content.*

See the link in the Lessons area for due dates and the rubric posted within the instructions for each forum to see expectations and how the discussion forums will be graded.

### **Homework Quizzes (20%):**

There will also be homework assignments for each weekly lesson to help you and your professor guide and assess your learning of the course material. These will be in the format of a quiz to simplify answer submission and to ensure immediate feedback (multiple choice, matching, T/F, etc.), but these are not timed quizzes. You will be allowed a maximum of two submissions for each homework quiz. If you submit more than once, your recorded score in the gradebook will be the average of your two scores. Upon submission, you will receive your score immediately, and be notified which answers are incorrect, if any, but you will not be shown your answers or the correct answers upon submission. There are 8 homework quizzes, each worth 2.5% of your course grade (thus, homework quizzes collectively make up 20% of your grade in this course).. Homework quizzes can be found in the Tests & Quizzes section of the classroom.

### **Tests (30%):**

There will be a timed test every 2 weeks in the course. The chapters included within each test are as follows: (Week 2) Test 1: Chapters 1-4, (Week 4) Test 2: Chapters 5-8, (Week 6) Test 3: Chapters 9-12, and (Week

8) Test 4: Chapters 13-15. Depending on the test, these may or may not include multiple question formats (multiple choice, short answer, matching, essay, etc.). The format will be very similar to the homework quizzes. There are 4 tests, each worth 7.5% of your course grade (thus, tests collectively make up 30% of your grade in this course). You will have **90 minutes** to complete each test—after **90 minutes**, the assessment will be submitted automatically and you will only be able to receive credit for what you have completed at that time. You will be allowed only one submission for each test. Tests can be found in the Tests & Quizzes section of the classroom.

### Nutritional Research Analysis Course Project (30%):

The course research project will span the duration of the course. It will begin in Week 1 with your topic choice (and a few other items related to your choice) that you will post in the first discussion forum. After you select and post your topic (and the other required items) in Forum 1, the project is then broken up into 4 separate assignments: client profile (2.5%, due Week 3), a nutritional analysis (10%, due Week 5), a dietary recommendation (7.5%, due Week 6), and a multimedia presentation (10%, due Week 7). Please see the [Course Project Guide](#) for more specific information about each individual assignment within the Course Research Project, parameters for selecting a topic, etc.

Please see the [student handbook](#) to reference the University's [grading scale](#).

### Grading:

Name	Grade %
Forum 1	2.50 %
Topic 1: Introductions	1.25 %
Topic 2: Project Topic	1.25 %
Forum 2	2.50 %
Lesson 2: Problem Solving	2.50 %
Forum 3	2.50 %
Lesson 3: Problem Solving	2.50 %
Forum 4	2.50 %
Lesson 4: Teaching for Understanding	2.50 %
Forum 5	2.50 %
Lesson 5: Teaching for Understanding	2.50 %
Forum 6	2.50 %
Lesson 6: Current Biochemistry	2.50 %
Forum 7	2.50 %
Lesson 7: Teaching for Understanding	2.50 %
Forum 8	2.50 %
Lesson 8: Presentations	2.50 %
Homework Quizzes	20.00 %
Homework Quiz 1	2.50 %
Homework Quiz 2	2.50 %
Homework Quiz 3	2.50 %
Homework Quiz 4	2.50 %
Homework Quiz 5	2.50 %
Homework Quiz 6	2.50 %
Homework Quiz 7	2.50 %
Homework Quiz 8	2.50 %
Tests	30.00 %
Test 1	7.50 %
Test 2	7.50 %
Test 3	7.50 %

Test 4	7.50 %
Course Project Assignment #1	2.50 %
Client Profile (Week 3)	2.50 %
Course Project Assignment #2	10.00 %
Nutritional Analysis (Week 5)	10.00 %
Course Project Assignment #3	7.50 %
Dietary Recommendation (Week 6)	7.50 %
Course Project Assignment #4	10.00 %
Multimedia Presentation (Week 7)	10.00 %

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## Materials

**Book Title:** Organic and Biochemistry for Today, 8th ed. - the VitalSource e-book is provided via the APUS Bookstore

**Author:** Seager & Slabaugh

**Publication Info:** Cengage

**ISBN:** 9781133605140

**Book Title:** You must validate your cart to get access to your VitalSource e-book(s). If needed, instructions are available here - <http://apus.libguides.com/bookstore/undergraduate>

**Author:** N/A

**Publication Info:** N/A

**ISBN:** N/A

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### Additional Resources:

You will also need Microsoft Word, Excel, Powerpoint, Adobe Reader and a scientific calculator. A free, open-source alternative to Microsoft Office may be downloaded from [OpenOffice.org](http://OpenOffice.org). A free download for Adobe Reader is available from <http://www.adobe.com/support/downloads/main.html>.

### Required Technology

See the [Technology Requirements chart](#) on the APUS website, which outlines the minimum technical requirements for the hardware and software needed to access your course work. Also included in the chart are recommended requirements, which if followed, will make your online learning experience more fulfilling.

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## Course Guidelines

### Citation and Reference Style

- Attention Please: Students will follow the APA Format as the sole citation and reference style used in written work submitted as part of coursework to the University. Assignments completed in a narrative essay or composition format must follow the citation style cited in the APA Format.

### Tutoring

- [Tutor.com](https://www.tutor.com) offers online homework help and learning resources by connecting students to certified tutors for one-on-one help. AMU and APU students are eligible for 10 free hours\* of tutoring provided by APUS. Tutors are available 24/7 unless otherwise noted. Tutor.com also has a SkillCenter Resource Library offering educational resources, worksheets, videos, websites and career help. Accessing these resources does not count against tutoring hours and is also available 24/7. Please visit the APUS Library and search for 'Tutor' to create an account.

## **Late Assignments**

- Students are expected to submit classroom assignments by the posted due date and to complete the course according to the published class schedule. The due date for each assignment is listed under each Assignment.
- Generally speaking, late work may result in a deduction up to 15% of the grade for each day late, not to exceed 5 days.
- As a working adult I know your time is limited and often out of your control. Faculty may be more flexible if they know ahead of time of any potential late assignments.

## **Turn It In**

- Faculty may require assignments be submitted to Turnitin.com. Turnitin.com will analyze a paper and report instances of potential plagiarism for the student to edit before submitting it for a grade. In some cases professors may require students to use Turnitin.com. This is automatically processed through the Assignments area of the course.

## **Academic Dishonesty**

- Academic Dishonesty incorporates more than plagiarism, which is using the work of others without citation. Academic dishonesty includes any use of content purchased or retrieved from web services such as CourseHero.com. Additionally, allowing your work to be placed on such web services is academic dishonesty, as it is enabling the dishonesty of others. The copy and pasting of content from any web page, without citation as a direct quote, is academic dishonesty. When in doubt, do not copy/paste, and always cite.

## **Submission Guidelines**

- Some assignments may have very specific requirements for formatting (such as font, margins, etc) and submission file type (such as .docx, .pdf, etc) See the assignment instructions for details. In general, standard file types such as those associated with Microsoft Office are preferred, unless otherwise specified.

## **Disclaimer Statement**

- Course content may vary from the outline to meet the needs of this particular group.

## **Communicating on the Forum**

- Forums are the heart of the interaction in this course. The more engaged and lively the exchanges, the more interesting and fun the course will be. Only substantive comments will receive credit. Although there is a final posting time after which the instructor will grade comments, it is not sufficient to wait until the last day to contribute your comments/questions on the forum. The purpose of the forums is to actively participate in an on-going discussion about the assigned content.
- “Substantive” means comments that contribute something new and hopefully important to the discussion. Thus a message that simply says “I agree” is not substantive. A substantive comment contributes a new idea or perspective, a good follow-up question to a point made, offers a response to a question, provides an example or illustration of a key point, points out an inconsistency in an argument, etc.
- As a class, if we run into conflicting view points, we must respect each individual's own opinion. Hateful and hurtful comments towards other individuals, students, groups, peoples, and/or societies will not be tolerated.

## Identity Verification & Live Proctoring

- Faculty may require students to provide proof of identity when submitting assignments or completing assessments in this course. Verification may be in the form of a photograph and/or video of the student's face together with a valid photo ID, depending on the assignment format.
  - Faculty may require live proctoring when completing assessments in this course. Proctoring may include identity verification and continuous monitoring of the student by webcam and microphone during testing.
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## University Policies

### [Student Handbook](#)

- [Drop/Withdrawal policy](#)
- [Extension Requests](#)
- [Academic Probation](#)
- [Appeals](#)
- [Disability Accommodations](#)

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