

## Course Home - Syllabus and Pacing Guide

### Syllabus

**BIO-503:** Systems Biology

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### Course Description

The course is intended to develop deeper insight into the complexities of cell structure and function within a biological system with a focus on modulations in gene expression, bioenergetics, nerve transmission, muscle contraction, immunology, and cancer. Throughout the course emphasis will be placed on how the dysfunction in these cellular processes disrupts the function of biological systems and leads to pathological conditions. A working knowledge of cell biology is recommended.

**Credit Hours:** 3

**Prerequisite Courses:** None

**Prerequisite Skills and Knowledge:** None

### Course Outcomes

**Upon completion of this course, you should be able to:**

1. Summarize the basic organization of cells into tissues.
2. Describe how cellular pathways modulate gene expression.
3. Explain the mechanisms by which the cell produces energy.
4. Describe the role of microfilaments, microtubules, and intermediate filaments in cell organization and/or movement.
5. Explain the basic structure and function of the nervous system.
6. Describe the mechanisms by which the body protects itself from invading organisms.
7. Summarize the genetic basis of cancer, how tumor cells develop, and metastatic cancers spread.
8. Describe a disease, how it develops, what body systems it affects, and how the disease is treated.
9. Prepare a biology lesson plan based upon one the key concepts covered in this course.

### Course Textbook

Lodish, H., Berk, A., Kaiser, C.A., Krieger, M., Bretscher, A., Ploegh, H., Amon, A., & Scott, M.P. (2013). *Molecular Cell Biology* (7th ed.). New York, NY: W.H. Freeman and Company.

### Course Technology

Adobe Reader

Google Chrome

Mozilla Firefox

Internet Explorer

### IWU Diversity Statement

IWU, in covenant with God's reconciling work and in accordance with the Biblical principles of our historic Wesleyan tradition, commits to build a community that reflects Kingdom diversity.

We will foster an intentional environment for living, teaching and learning, which exhibits honor, respect, and dignity. Acknowledging visible or invisible differences, our community authentically values

each member's earthly and eternal worth. We refute ignorance and isolation and embrace deliberate and courageous engagement that exhibits Christ's commandment to love all humankind.

## Grading Scale

Grade	Quality Points Per Credit	Percentage	Score
<b>A</b>	4.0	95%–100%	950–1000
<b>A-</b>	3.7	92%–94.9%	920–949
<b>B+</b>	3.3	89%–91.9%	890–919
<b>B</b>	3.0	85%–8.9%	850–889
<b>B-</b>	2.7	82%–84.9%	820–849
<b>C+</b>	2.3	79%–81.9%	790–819
<b>C</b>	2.0	75%–78.9%	750–789
<b>C-</b>	1.7	72%–74.9%	720–749
<b>D+</b>	1.3	69%–71.9%	690–719
<b>D</b>	1.0	65%–68.9%	650–689
<b>F</b>	0.0	0%–64.9%	0–649

## Grading Policies

Your grading policy for your course is dependent on your school and program. Your grading policies can be found in the IWU Catalog.

## Letter Grade Equivalencies

Grade	Description of Work
<b>A</b>	Clearly stands out as excellent performance. Has unusually sharp insights into material and initiates thoughtful questions. Sees many sides of an issue. Articulates well and writes logically and clearly. Integrates ideas previously learned from this and other disciplines. Anticipates next steps in progression of ideas. Example "A" work should be of such nature that it could be put on reserve for all cohort members to review and emulate. The "A" cohort member is, in fact, an example for others to follow.
<b>B</b>	Demonstrates a solid comprehension of the subject matter and always accomplishes all course requirements. Serves as an active participant and listener. Communicates orally and in writing at an acceptable level for the degree program. Work shows intuition and creativity. Example "B" work indicates good quality of performance and is given in recognition for solid work; a "B" should be considered a good grade and awarded to those who submit assignments of quality less than the exemplary work described above.
<b>C</b>	Quality and quantity of work in and out of class is average. Has marginal comprehension, communication skills, or initiative. Requirements of the assignments are addressed at least minimally.
<b>D</b>	Quality and quantity of work is below average. Has minimal comprehension, communication skills, or initiative. Requirements of the assignments are addressed at below acceptable levels.

<b>F</b>	Quality and quantity of work is unacceptable and does not qualify the student to progress to a more advanced level of work.
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### Course Module Summary

Module	Devotion	Discussion	Dropbox	Project	Total Points per Module
<b>Course Orientation</b>			20		20
<b>Module One</b>	5	40	120		165
<b>Module Two</b>	5	40	50		95
<b>Module Three</b>	5	30	100		135
<b>Module Four</b>	5		140		145
<b>Module Five</b>	5	40	70		115
<b>Module Six</b>	5		120		125
<b>Module Seven</b>				100	100
<b>Module Eight</b>				100	100
<b>TOTAL</b>	<b>30</b>	<b>150</b>	<b>620</b>	<b>200</b>	<b>1000</b>

### Pacing Guides

#### Six Week Guide (Used Only in Special Circumstances)

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
<b>Module 1</b>	MOD 1					
<b>Module 2</b>		MOD 2				
<b>Module 3</b>			MOD 3			
<b>Module 4</b>				MOD 4		
<b>Module 5</b>					MOD 5	
<b>Module 6</b>						MOD 6
<b>Module 7</b>	MOD 7	MOD 7	MOD 7	MOD 7		
<b>Module 8</b>				MOD 8	MOD 8	MOD 8

#### Eight Week Guide (Standard Pacing Guide)

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
<b>Module 1</b>	MOD 1							

<b>Module 2</b>		MOD 2						
<b>Module 3</b>		MOD 3	MOD 3					
<b>Module 4</b>					MOD 4			
<b>Module 5</b>						MOD 5		
<b>Module 6</b>							MOD 6	
<b>Module 7</b>	MOD 7	MOD 7	MOD 7	MOD 7	MOD 7			
<b>Module 8</b>				MOD 8	MOD 8	MOD 8	MOD 8	MOD 8

## Course Assignments

### Module One Outline

Assignments	Type	Due	Estimated Time*	Points
<b>1.1 Devotional</b>	Discussion	Initial posting by day 4 of the module. Reply posts by the end of the module.	30 minutes	5
<b>1.2 Read Chapters 20 and 16</b>	Reading	By the end of the module	6:45 hours	0
<b>1.3 Answer Questions</b>	Dropbox	By the end of the module	4 hours	120
<b>1.4 Ethical Issues in Science</b>	Discussion	Initial posting by day 4 of the module. Reply posts by the end of the module.	3 hours	40
<b>Totals</b>			<b>14:15 hours</b>	<b>165</b>

### Module Two Outline

Assignments	Type	Due	Estimated Time*	Points
<b>2.1 Devotional</b>	Discussion	Initial posting by day 4 of the module. Reply posts by the end of the module.	30 minutes	5
<b>2.2 Read Chapter 12</b>	Reading	By the end of the module	3:15 minutes	0
<b>2.3 Answer Questions</b>	Dropbox	By the end of the module	1:45 minutes	50
<b>2.4 Ethical Issues in Science</b>	Discussion	Initial posting by day 4 of the module. Reply posts by the end of the module.	3 hours	40

<b>Totals</b>	<b>8:30 hours</b>	<b>95</b>
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### Module Three Outline

Assignments	Type	Due	Estimated Time*	Points
<b>3.1 Devotional</b>	Discussion	Initial posting by day 4 of the module. Reply posts by the end of the module.	30 minutes	5
<b>3.2 Read Chapters 17 and 18</b>	Reading	By the end of the module	6:45 hours	0
<b>3.3 Answer Questions</b>	Dropbox	By the end of the module	3:15 hours	100
<b>3.4 Scientific Reading</b>	Discussion	Initial posting by day 4 of the module. Reply posts by the end of the module.	3 hours	30
<b>Totals</b>			<b>13:30 hours</b>	<b>135</b>

### Workshop Four Outline

Assignments	Type	Due	Estimated Time*	Points
<b>4.1 Devotional</b>	Discussion	Initial posting by day 4 of the module. Reply posts by the end of the module.	30 minutes	5
<b>4.2 Read Chapter 22</b>	Reading	By the end of the module	3:30 hours	0
<b>4.3 Answer Questions</b>	Dropbox	By the end of the module	3:15 hours	100
<b>4.4 Systems Integration</b>	Dropbox	By the end of the module	3:15 hours	40
<b>Totals</b>			<b>10:30 hours</b>	<b>145</b>

### Module Five Outline

Assignments	Type	Due	Estimated Time*	Points
<b>5.1 Devotional</b>	Discussion	Initial posting by day 4 of the module. Reply posts by the end of the module.	30 minutes	5

<b>5.2 Read Chapter 23</b>	Reading	By the end of the module	3:30 hours	0
<b>5.3 Answer Questions</b>	Dropbox	By the end of the module	2:15 hours	70
<b>5.4 Current Issues in Science</b>	Discussion	Initial posting by day 4 of the module. Reply posts by the end of the module.	3:15 hours	40
<b>Totals</b>			<b>9:30 hours</b>	<b>115</b>

### Module Six Outline

Assignments	Type	Due	Estimated Time*	Points
<b>6.1 Devotional</b>	Discussion	Initial posting by day 4 of the module. Reply posts by the end of the module.	30 minutes	5
<b>6.2 Read Chapter 24</b>	Reading	By the end of the module	3:15 hours	0
<b>6.3 Answer Questions</b>	Dropbox	By the end of the module	1:45 hours	50
<b>6.4 Cancer Research Paper</b>	Dropbox	By the end of the module	5 hours	70
<b>Totals</b>			<b>10:30 hours</b>	<b>125</b>

### Module Four Outline

Assignments	Type	Due	Estimated Time*	Points
<b>7.1 Methodology Presentation</b>	Discussion	By the end of the fourth week	3:15 hours	70
<b>7.2 Presentation Review</b>	Discussion	By the end of the fifth week	1 hour	30
<b>Totals</b>			<b>4:15 hours</b>	<b>100</b>

### Module Eight Outline

Assignments	Type	Due	Estimated Time*	Points
<b>8.1 Lesson Plan</b>	Dropbox	By the end of the module	6 hours	100
<b>Totals</b>			<b>6 hours</b>	<b>100</b>

\* These timings are based on estimations of average times to complete each assignment. Actual assignment completion times will vary.

# Expectations, Policies, and Important Student Information

## Expectations

### Instructor Expectations of Students

- Submit assignments on time. If there are circumstances beyond your control, discuss possible options for completion with your instructor.
- Accomplish work on your own unless otherwise instructed (i.e., do not cheat or plagiarize).
- Contribute substantively to discussions according to assignment guidelines provided.
- Contribute to discussions throughout each workshop rather than waiting until the end of the workshop.
- Contribute substantively to group assignments (if required in course).
- After spending a reasonable amount of time on it, ask your instructor if you do not understand content or instructions. Ask for help early while there is time to fix problems.
- Treat other students courteously and respectfully.
- Every time you enter your course, read and abide by postings made in the Announcements and Faculty Forum. These postings are critical.

### Students' Expectations of Instructor

- Set a friendly, open, and encouraging learning environment.
- Guide discussions as needed.
- Set clear rules, standards, and expectations.
- Provide workshop grades and feedback within seven days of assignment due date.
- Provide final grades and feedback within seven days after the last day of class.
- Ensure students treat each other respectfully.
- Respond to student inquiries within 48 hours.

## Policies

### Late Policy

- No credit is available for postings of any kind made in the discussion forums after a given workshop ends.
- If your instructor approves your submission of late assignments, each assignment score will be penalized 10% per day up to five days late. After the end of the fifth day, late assignments will not be accepted. An assignment is a paper, a project, a team presentation, etc., but not a discussion or quiz/test.
- No late assignments will be accepted after the close of the final workshop.
- **Unless otherwise stated by the course instructor, all assignments are due by 11:59pm EST.**

### Withdrawal Policy

Students needing to withdraw while in a course may do so by arrangement with the Office of Student Services prior to the end of the course, but the regular refund and academic withdrawal policies apply.