

# Syllabus

**Indian Wesleyan University**  
**BIO-503: Systems Biology (Online)**  
**Session Dates:** 8/26/19 – 10/20/19  
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## Course Description

This course investigates the major principles and concepts of biological systems, including the fundamentals of mathematical and physiological modeling, a detailed analysis of gene, protein, and metabolic systems, as well as the application of systems biology in health and medicine. Prerequisite: a bachelor's degree with a Biology major or must be state certified (in any state) to teach Biology at a secondary school level. Undergraduate coursework must include a "C" level or higher in Introductory Biology, Introductory Biology Lab, General Chemistry, and General Chemistry Lab. Note: This course is designed for those seeking the credentials required by many regional accrediting bodies in order to be able to teach advanced placement, concurrent early college, and undergraduate college Biology courses.

**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%–88.9%	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.

## Course Module Summary

Module	Devotion	Discussion	Dropbox	Project	Total Points per Module
<b>Course Orientation</b>		15	5		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>175</b>	<b>605</b>	<b>200</b>	<b>1000</b>

## Pacing Guides

## Six Week Guide

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Module 1	MOD 1					
Module 2		MOD 2				
Module 3			MOD 3			
Module 4				MOD 4		
Module 5					MOD 5	
Module 6						MOD 6
Module 7	MOD 7	MOD 7	MOD 7	MOD 7		
Module 8				MOD 8	MOD 8	MOD 8

## Eight Week Guide

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Module 1	MOD 1							
Module 2		MOD 2						
Module 3		MOD 3	MOD 3					
Module 4					MOD 4			
Module 5						MOD 5		
Module 6							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>			14:15 hours	165

### 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>			8:30 hours	95

## 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>			13:30 hours	135

## 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>
<b>TOTALS</b>			<b>71 hours*</b>	<b>1000</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.**

### Attendance Policy

Onsite:

Students are expected to be present when class begins, and remain the entire workshop. To be counted present, a student must attend a total of three hours or more

of a class that is four hours in length, or four and one-half hours or more of classes that are six hours in length.

Online:

Attendance is determined by activity during a workshop, either through discussions or submission of assignments. A student is reported absent for a workshop if there is not at least one submission (or posting) of an assignment or in a discussion forum assigned during that workshop.

### **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.

### **University Policies**

- CAPS Catalog - <https://www.indwes.edu/catalog>
- College of Adult and Professional Studies Policies - <http://indwes.smartcatalogiq.com/en/2016-2017/Catalog/College-of-Adult-and-Professional-Studies-CAPS/Policies-and-General-Information-CAPS>

### **DeVoe School of Business**

- [College of Adult and Professional Studies Policies and General Information](#) (*Attendance Policy; Computer Requirements; Honesty, Cheating, Plagiarism, and Forgery Policy; and Student Address/Email Information are found here.*)
- [Undergraduate Business Programs](#)
- [Graduate Business Programs](#)
- [DeVoe School of Business Website](#)
- [The DeVoe Report Digest](#) (*The DeVoe Report Digest provides applicable insight into best business practice with credible commentary on current marketplace events.*)

### **School of Service and Leadership**

- School of Service and Leadership Policies - <http://indwes.smartcatalogiq.com/en/2014-2015/Catalog/College-of-Adult-and-Professional-Studies-CAPS/Copy-of-School-of-Service-and-Leadership>
- Graduate Studies in Leadership Division Polices - <http://indwes.smartcatalogiq.com/en/2014-2015/Catalog/College-of-Adult-and-Professional-Studies-CAPS/Copy-of-School-of-Service-and-Leadership/Graduate-Studies-in-Leadership-Division>
- Attendance Policy - <http://indwes.smartcatalogiq.com/en/2014-2015/Catalog/College-of-Adult-and-Professional-Studies-CAPS/Policies-and-General-Information-CAPS/Academic-Information-CAPS/Attendance-Policy-CAPS>
- Computer Requirements - <http://indwes.smartcatalogiq.com/en/2014-2015/Catalog/College-of-Adult-and-Professional-Studies-CAPS/Policies-and-General-Information-CAPS/Academic-Information-CAPS/Computer-Requirements-CAPS>
- Honesty, Cheating, Plagiarism, and Forgery Policy - <http://indwes.smartcatalogiq.com/en/2014-2015/Catalog/Indiana-Wesleyan-University-at-a-Glance/Honesty-Cheating-Plagiarism-and-Forgery>

- Student Address/Email Information - <http://indwes.smartcatalogiq.com/en/2014-2015/Catalog/College-of-Adult-and-Professional-Studies-CAPS/Policies-and-General-Information-CAPS/General-Information-CAPS/Student-AddressEmail-Information>

### Division of Liberal Arts

- School of Service and Leadership Policies - <http://indwes.smartcatalogiq.com/en/2014-2015/Catalog/College-of-Adult-and-Professional-Studies-CAPS/Division-of-Liberal-Arts>
- Attendance Policy - <http://indwes.smartcatalogiq.com/en/2014-2015/Catalog/College-of-Adult-and-Professional-Studies-CAPS/Policies-and-General-Information-CAPS/Academic-Information-CAPS/Attendance-Policy-CAPS>
- Computer Requirements - <http://indwes.smartcatalogiq.com/en/2014-2015/Catalog/College-of-Adult-and-Professional-Studies-CAPS/Policies-and-General-Information-CAPS/Academic-Information-CAPS/Computer-Requirements-CAPS>
- Honesty, Cheating, Plagiarism, and Forgery Policy - <http://indwes.smartcatalogiq.com/en/2014-2015/Catalog/Indiana-Wesleyan-University-at-a-Glance/Honesty-Cheating-Plagiarism-and-Forgery>
- Student Address/Email Information - <http://indwes.smartcatalogiq.com/en/2014-2015/Catalog/College-of-Adult-and-Professional-Studies-CAPS/Policies-and-General-Information-CAPS/General-Information-CAPS/Student-AddressEmail-Information>

## Important Student Information

### Off Campus Library Services

As an IWU student, you have library privileges through Off Campus Library Services. Go to <http://www.indwes.edu/ocls/> to learn more about the library. These are your privileges. Services provided include:

- Access to books (print and e-books), article databases, services and web resources.
- Access to many full text articles.
- Document delivery, which includes mailing print books, scanning PDF articles (that are only available in paper in the IWU library), providing a service of interlibrary loan whereby items not owned by IWU are obtained on your behalf from other libraries that own the item.
- Consultation with APA writing style. The librarians are not editors, but they are extremely knowledgeable about APA and are glad to answer your specific questions regarding correct ways to use APA.
- Provision of customized research guides for your particular topic that will walk you through the steps to locate appropriate articles/books on your topic.
- A general go-to source for helping you find information for your research projects.

In order to use many of the library databases, you either need your MyIWU credentials OR the Library Access Number sent to you via email from OCLS. It will be needed to get into the proprietary subscription-based databases; to check out print books and for some classes you will be asked to access specific articles as additional reading. Links directly to these articles will be provided.

If you need help, contact OCLS; 800-521-1848  
or <http://www2.indwes.edu/forms/request.aspx>.

### APA Writing Style

APA (American Psychological Association) writing style, based on the *Publication Manual of the American Psychological Association*, 6th ed., is the foundation for all academic writing in for non-

residential students. All students will be required to adhere to the formatting, citing and documentation of all sources used in a research paper per the guidelines of APA. Resources for learning APA and resources for using APA are provided as follows:

- Some programs purchase the *Publication Manual of the American Psychological Association*, 6th ed.
- *APA 6e Guide*, available at <http://www2.indwes.edu/APA/APA6eGuide.pdf>. This resource also includes some specific references entries for IWU specific resources, e.g. catalog, IWU library databases, etc.
- OCLS APA Resource page, that includes a Word template; APA checklist; APA focused videos, etc., at: [http://www2.indwes.edu/style\\_guide.html](http://www2.indwes.edu/style_guide.html)
- APA Style CENTRAL, includes a personalized learning system for APA and an interactive APA template for writing and saving papers.
- Off Campus Library Services librarians, <http://www2.indwes.edu/forms/request.aspx> or 800.521.1848.

### Special Needs

If you need accommodations for your course, you can email [ADARquest@indwes.edu](mailto:ADARquest@indwes.edu) with your request, and you will be forwarded forms to fill out and return. Once all forms are received and reviewed, a determination is made on reasonable accommodations and you will receive an Academics Adjustment Notification. You will be required to give this notification to your instructor before the beginning of each of your courses.

### Smarthinking

Access to both live and online tutoring can be found through your course under *Content>>Course Dashboard>>IWU Resources*.

### Netiquette

In the online classroom, people cannot see your face, they cannot hear the tone or inflection of your voice, and they cannot observe your body language to determine your intention. Therefore, when responding to another student's post, or even in creating your own, it is very important to write your thoughts out and take a few minutes away from them. Then reread what you wrote and make sure it answers the question(s) and is worded in a way that is not likely to offend others.

- It is okay to disagree, but do so in a manner that is constructive rather than destructive, encouraging rather than denigrating.
- It is very easy to say the right words but for them to be "heard" incorrectly. Take the time to review what you type. This is one of the benefits of online education; you have the ability to wait and rethink what you will say before you say it.
- USING ALL CAPITAL LETTERS IS THE SAME AS SHOUTING!!!! Use capitals only to emphasize a point; do not type full posts in capital letters.
- Respect others' opinions as you would have yours respected.
- This is a Christian school; please respect the religious beliefs of those around you.