Texas A&M University-Commerce
2600 S. Neal St, Commerce, TX 75429-3011
Biological and Environmental Sciences
Tel) 903-886-5378 Fax) 903-886-5997

BIOL2420 – General Microbiology 01E

Syllabus (Fall 2024)

Instructor: DongWon Choi, PhD
Office: 208 Science (STC)
Phone: 903-886-5221
Email: dongwon.choi@tamuc.edu
Fax: 903-886-5997
Office Hours: 10-Noon, MW; 10-11AM, R

Aug 26 – Dec 13
Classroom: STC 127
TR 11:00AM – 12:15 PM

University Statements

Academic integrity: As members of Texas A&M University-Commerce academic community, we all are responsible to underpin the principles of academic integrity expressed by this community. We are expected to watch these principles to be kept and appreciated by others.

- The first instance of cheating will result in an automatic Zero on the exam. A second instance will result in Zero course grade (automatic F).
  Cheating is defined as:
  - Copying another's test, assignment, or lecture slides
  - Communication with another during an exam (i.e. written, oral or otherwise)
  - Giving or seeking aid from another
  - Possessing or using unauthorized materials during the test
  - Buying, using, stealing, transporting, or soliciting a test, draft of a test, or answer key
- Plagiarism is a serious academic criminal activity. You must cite all sources of information with properly accredited. Copying material, whether parts or whole, will result in Zero for your term paper and can incur in further University disciplinary consequences.

USE of AI: Texas A&M University-Commerce acknowledges that there are legitimate uses of Artificial Intelligence, ChatBots, or other software that has the capacity to generate text, or suggest replacements for text beyond individual words, as determined by the instructor of the course.

Any use of such software must be documented. Any undocumented use of such software constitutes an instance of academic dishonesty (plagiarism).

Individual instructors may disallow entirely the use of such software for individual assignments or for the entire course. Students should be aware of such requirements and follow their instructors' guidelines. If no instructions are provided the student should assume that the use of such software is disallowed.

In any case, students are fully responsible for the content of any assignment they submit, regardless of whether they used an AI, in any way. This specifically includes cases in which the AI plagiarized another text or misrepresented sources.

13.99.99.R0.03 Undergraduate Academic Dishonesty
13.99.99.R0.10 Graduate Student Academic Dishonesty

Nondiscrimination Notice: Texas A&M University-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

Campus Concealed Carry Statement: Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in Texas A&M University-Commerce buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and A&M-Commerce Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations.
For a list of locations, please refer to the Carrying Concealed Handguns On Campus document and/or consult your event organizer;
found at
http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf

Pursuant to PC 46.035, the open carrying of handguns is prohibited on all A&M-Commerce campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1.

Accommodations: The American with Disability Act (ADA) is a federal anti-discrimination statue that provides comprehensive civil rights protection for persons with disabilities. Among other aspects, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have disability requiring accommodation, please contact:

Office of Student Disability Resources or Services
Texas A&M University-Commerce
Gee Library, Room 162
Tel) 903-886-5150, 903-886-5835
Fax) 903-468-8148
Email) StudentDisabilityService@tamuc.edu

Access to student work: Copies or your work in this course including copies of any submitted papers and your portfolios may be kept on file storage for institutional research, assessment, and accreditation purposes. All work used for these purposes will remain anonymous.

The Counseling Center at A&M-Commerce, located in the Halladay Building, Room 203, offers counseling services, educational programming, and connection to community

resources for students. Students have 24/7 access to the Counseling Center's crisis assessment services by calling 903-886-5145. For more information regarding Counseling Center events and confidential services, please visit www.tamuc.edu/counsel

Course Description

Biol 2420 is a course for non-biology majoring undergraduate students designed to provide basic principles of microbial life. Although relatively simple and primitive, microorganisms are considered as the most successful form of life. They are virtually everywhere and they are in tight relationship with other forms of life on earth. Unlike macroorganisms (i.e. animals, plants, insects, etc), microorganisms carry out their life processes such as energy metabolism, growth, and reproduction independently from other cells. This unique feature makes microorganisms a great tool to study the nature of life. The course will cover eukaryotic and prokaryotic microbes and viruses, with major emphasis on bacteria.

REQUIRED textbook:
Madigan, Martinko, Dunlab, Clark. 2009. Brock Biology of Microorganisms. 12th edition, Pearson Benjamin Cummings. ISBN: 978-0-13-232460-1
Newer editions are also acceptable.

Student learning outcomes

Upon completion of this course, you should be able to;

1. Compare and distinguish the basic groups of microbes, especially prokaryotic microbes (archaea, bacteria).
2. Understand the processes needed for one bacterium to become two, and understand the mechanisms involved.
3. Compare and contrast major pathways of catabolism, specify the relative energy yield from each pathway, list the key products of each pathway, and describe biochemical pathways used for microbial taxonomy.
4. Compare and contrast major pathways of biosynthesis and list the key products of each pathway.
5. Draw a typical microbial growth curve, and predict the effect of different environmental conditions on microbial growth.
6. Compare and contrast eukaryotic and prokaryotic genomes, and gene expression in each group.
7. List different types of symbiotic interactions between microbes and other organisms, including commensalism, mutualism, and parasitism, and provide examples of each.
8. Summarize common features of microbial pathogens, with emphasis on bacterial pathogens.
9. Have a solid grasp of the scope of microbial life and its central roles in both human activities and the web of life on Earth.

TECHNOLOGY REQUIREMENTS

Browser support

D2L is committed to performing key application testing when new browser versions are released. New and updated functionality is also tested against the latest version of supported browsers. However, due to the frequency of some browser releases, D2L cannot guarantee that each browser version will perform as expected. If you encounter any issues with any of the browser versions listed in the tables below, contact D2L Support, who will determine the best course of action for resolution. Reported issues are prioritized by supported browsers and then maintenance browsers.

Supported browsers are the latest or most recent browser versions that are tested against new versions of D2L products. Customers can report problems and receive support for issues. For an optimal experience, D2L recommends using supported browsers with D2L products.

Maintenance browsers are older browser versions that are not tested extensively against new versions of D2L products. Customers can still report problems and receive support for critical issues; however, D2L does not guarantee all issues will be addressed. A maintenance browser becomes officially unsupported after one year.

Note the following:

- Ensure that your browser has JavaScript and Cookies enabled.
- For desktop systems, you must have Adobe Flash Player 10.1 or greater.
- The Brightspace Support features are now optimized for production environments when using the Google Chrome browser, Apple Safari browser, Microsoft Edge browser, Microsoft Internet Explorer browser, and Mozilla Firefox browsers.

Desktop Support

Browser	Supported Browser Version(s)	Maintenance Browser Version(s)
Microsoft® Edge	Latest	N/A
Microsoft® Internet Explorer®	N/A	11
Mozilla® Firefox®	Latest, ESR	N/A

Browser	Supported Browser Version(s)	Maintenance Browser Version(s)
Google® Chrome™	Latest	N/A
Apple® Safari®	Latest	N/A

Tablet and Mobile Support

Device	Operating System	Browser	Supported Browser Version(s)
Android™	Android 4.4+	Chrome	Latest
Apple	iOS®	Safari, Chrome	The current major version of iOS (the latest minor or **point** release of that major version) and the previous major version of iOS (the latest minor or **point** release of that major version). For example, as of June 7, 2017, D2Lsupports iOS 10.3.2 and iOS 9.3.5, but not iOS 10.2.1, 9.0.2, or any other version. Chrome: Latest version for the iOS browser.
Windows	Windows 10	Edge, Chrome, Firefox	Latest of all browsers, and Firefox ESR.

- You will need regular access to a computer with a broadband Internet connection. The minimum computer requirements are:
    - 512 MB of RAM, 1 GB or more preferred
    - Broadband connection required courses are heavily video intensive
    - Video display capable of high-color 16-bit display 1024 x 768 or higher resolution

- Both versions of Java (32 bit and 64 bit) must be installed and up to date on your machine. At a minimum Java 7, update 51, is required to support the learning

management system. The most current version of Java can be downloaded at: JAVA web site http://www.java.com/en/download/manual.jsp

- Current anti-virus software must be installed and kept up to date.

Running the browser check will ensure your internet browser is supported.

Pop-ups are allowed.

JavaScript is enabled.

Cookies are enabled.

- You will need some additional free software (plug-ins) for enhanced web browsing. Ensure that you download the free versions of the following software:
  - Adobe Reader https://get.adobe.com/reader/
  - Adobe Flash Player *(version 17 or later)* https://get.adobe.com/flashplayer/
  - Adobe Shockwave Player https://get.adobe.com/shockwave/
  - Apple Quick Time http://www.apple.com/quicktime/download/

- At a minimum, you must have Microsoft Office 2013, 2010, 2007 or Open Office. Microsoft Office is the standard office productivity software utilized by faculty, students, and staff. Microsoft Word is the standard word processing software, Microsoft Excel is the standard spreadsheet software, and Microsoft PowerPoint is the standard presentation software. Copying and pasting, along with attaching/uploading documents for assignment submission, will also be required. If you do not have Microsoft Office, you can check with the bookstore to see if they have any student copies.

ACCESS AND NAVIGATION

You will need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or helpdesk@tamuc.edu**.**

Note: Personal computer and internet connection problems do not excuse the requirement to complete all course work in a timely and satisfactory manner. Each student needs to have a backup method to deal with these inevitable problems. These methods might include the availability of a backup PC at home or work, the

temporary use of a computer at a friend's home, the local library, office service companies, Starbucks, a TAMUC campus open computer lab, etc.

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Student Support

If you have any questions or are having difficulties with the course material, please contact your Instructor.

Technical Support

If you are having technical difficulty with any part of Brightspace, please contact Brightspace Technical Support at 1-877-325-7778 or click on the **Live Chat** or click on the words "click here" to submit an issue via email.

System Maintenance

Please note that on the 4th Sunday of each month there will be System Maintenance which means the system will not be available 12 pm-6 am CST.

Grading Policy

The final course evaluation will be comprised of the lecture grade portion (75%; 600 pts total) and the laboratory grade portion (25%; 200 pts total). Lecture grade portion consists as below.

Term paper (see details below)	= 50 points
3 Mid-term exams (100 pts. each)	= 300 points
Comprehensive Final	= 150 points
10 quizzes (10 pts. each)	= 100 points
Total	600 points

Grading Scale

The final course grade will be assigned based on the following break-down;

90 – 100%	= A
80 – 89%	= B
70 – 79%	= C
60 – 69%	= D
59% and below	= F

Teaching Methodology

Attendance *One letter grade drop for every five unexcused absences.*

Term paper Write a synopsis about one recent research article related to microbiology. Topic selection (10pts) before the Exam 1 (due by week 4), and the paper (40pts) is due by the week of Exam 3 (Week 14).

- Topic selection: Choose a topic relevant to microbiology. To complete the topic selection, you have to find one **Full** research article (published in a peer-reviewed scientific journal) covering your topic and upload to the **topic selection Dropbox** of the eCollege course shell. The full research article **must** be a **PDF format**.
- *Contents of the paper:* Discuss your chosen "general topic" related to microbiology, with sufficient discussion of background information to allow anyone taking the class to understand the significance. Research approaches and future directions may also be briefly discussed. The length of the paper is about 3-4 pages of single-spaced text. You can provide figures but figures need to be thoroughly explained in the text. Write with your classmates as the targeted readers. You should not "reuse" a topic used for other courses.
- *Sources and their use:* In recent years there has been a tendency to rely more heavily on web pages as sources. Students are warned that plagiarizing any source is a serous violation of academic standards—credit and use your sources properly. A definition of plagiarism can be found in the section of University Statement. **Note: I allow the use of some figures downloaded from the web, but you should cite the reference or give the website. Figure legends should be your own with succinct and clear information.
- *Style:* Papers will be judged on their organization and the clarity of writing. Papers that have numerous misspellings or grammatical errors will be rated poorly and this rating will seriously impact the grade. Proofread carefully. Use spelling checkers. Have others read the paper both for clarity and content. The paper should follow a review paper writing style with citation systems of either Citation-Sequence or Name-Year.

Exams

No exam grades will be dropped. Any student caught cheating on an exam will receive a zero for that exam. **Cheating** is defined as:

- Copying another's test, assignment, or lecture slides
- Communication with another during an exam (i.e. written, oral or otherwise)
- Giving or seeking aid from another
- Possessing or using unauthorized materials during the test
- Buying, using, stealing, transporting, or soliciting a test, draft of a test, or answer key

Term Exams There will be 3 exams. The exams will consist of multiple choices, short answer questions, and short assay-type questions. Assay-type questions will ask bigger picture of class lecture topics. Exams will be taken in class hours.

Comprehensive Final The final exam will consist of multiple choices and short answer questions, as well as assay-type questions. The exam will cover all class materials covered through the semester.

Quizzes There will be 10 quizzes given during the semester. Quiz schedule will be announced during class hours one week prior to the quiz. A typical quiz comprises seven 1-point questions. You will get 3 automatic points by simply taking the quiz.

Makeup The student is responsible for requesting a makeup when they are unable to take the regularly scheduled exams. The request should be made within 7 days of

the absence. Makeup exams will be scheduled only in the event of EXCUSED absence (as defined in the Student's Guidebook). If the test is not made-up, the student will receive Zero for that exam. **No make-ups for quizzes**. Excused absences include;

- Verified illness (with Doctor's note)
- Death in a student's immediate family
- Obligation of student at a legal proceedings in fulfilling responsibility as a citizen
- Elective TAMUC activities (with the activity director's note)

Class Schedule

Week 1 (Quiz 1)
- Chapter 1, Introduction

Week 2 (Quiz 2)
- Chapter 2, Microscopy and Microbial Diversity

Week 3
- Chapter 3, Cellular Components

Week 4 (Quiz 3, Exam 1 , **Topic Selection)**
- Chapter 3, Cellular Components
- **Exam 1 (Chapters 1-3)**

Week 5
- Chapter 4, Cellular Structure and Functions

Week 6 (Quiz 4)
- Chapter 4, Cellular Structure and Functions

Week 7
- Chapter 5, Nutrition and Metabolism

Week 8 (Quiz 5, **Exam 2**)
- Chapter 5, Nutrition and Metabolism
- **Exam 2 (Chapters 4–5)**

Week 9
- Chapter 6, Microbial Growth

Week 10 (Quiz 6)
- Chapter 6, Microbial Growth

Week 11
- Chapter 7, Essentials-Molecular biology

Week 12 (Quiz 7)
- Chapter 7, Essentials-Molecular biology

Week 13, (Nov 25, Thanksgiving break)

No Classes

Week 14 (**Term Paper Due & Exam 3**)
- Chapter 10, Virus and Bacteriophage
- **Exam 3 (Chapters 6-7)**

Week 15 (Quiz 9)

- Chapter 28, Microbial Interactions with Humans

Week 16 (Finals Week)

Comprehensive Final Exam (10:30AM-12:30PM, Dec. 10th)

All dates and assignments are tentative and subject to change.