BSc 550 – Microbial Physiology
Syllabus (Fall 2019)

Instructor: DongWon Choi, PhD   Aug 26 – Dec 13
Office: 260 Science (STC)   Web based class
Phone: 903-468-8153
Fax: 903-886-5997
Email: dongwon.choi@tamuc.edu (preferred)
                Preferred form of communication: Email
                Communication response time: three days

Course Description

BSc550, Microbial Physiology, is an advanced microbiology course designed for MS students majoring in biology. Microbial physiology is a study to understand cell structure, growth factors, metabolism and genetic compositions of microorganisms and to comprehend the interrelatedness of microbiology, biochemistry, and genetics in the context of functional bacterial cells. This course provides a survey of microbial physiology with emphasis on bacteria metabolism, regulation, cellular structure, ecology, and adaptation to extreme environments.

REQUIRED Textbook:
Byung H. Kim and Geoffrey Michael Gadd, Bacterial Physiology and Metabolism, Cambridge University Press, ISBN: 978-0-521-71230-9

Prerequisite: Biology (microbiology and biochemistry or equivalents are not required but strongly recommended)

Student learning outcomes

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

1) Gain a fundamental understanding of cellular composition, membrane transport, energy metabolism.

2) Explain the ways microorganisms grow, proliferate, and die in a given environment and mechanisms beneath those life events.

3) Understand diversity of metabolic processes

4) Develop scientific writing skills.

On-line Class Policy

This is a "web-based" course - you don't actually attend lecture classes. Instead, all class activities will be held in D2L enters through MyLeo page. Check the website frequently (daily!!!) for announcements, instructions, and discussions. Try navigating the site early so you know that you can access everything. If you have difficulties with any material, talk to me immediately.

For successful course completion, your participation is essential. Students should check lecture material, assignments, and tests on regular basis. Yes, this course is mainly self-paced. However, it is strongly recommended that you schedule your specific work time that works best for you. Don't forget that the websites is active 24/7 during the semester.

- The material for this class will be organized around content blocks. Students are expected to read the assigned textbook material and lecture notes and comply with given due dates for the assignments
- Exams access will be available only during the pre-announced period of time. After this given period, you will not be able to have an access to that exam.

Academic Honesty

Students who violate Texas A&M University - Commerce rules of scholastic dishonesty are subject to disciplinary penalties, including (but not limited to) receiving a failing grade on the assignment/assessment and/or test, the possibility of failure in the course, and/or dismissal from the University. Since dishonesty harms the individual, all students, and the integrity of the University, policies on scholastic dishonesty will be strictly enforced. In all instances, incidents of academic dishonesty will be reported to the Graduate School and Provost Office. Please be aware that academic dishonesty includes (but is not limited to) cheating, plagiarism, and collusion.

Cheating is defined as:
- Copying lecture materials while taking tests/exams
- Copying another's test of assignment
- Communication with another during an test or assignment (i.e. written, oral or otherwise)
- Giving or seeking aid from another when not permitted by the instructor
- 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 criminal activity and defined as:
- Using someone else's work in your assignment without appropriate acknowledgement
- Making slight variations in the language and then failing to give credit to the source Students must cite all sources of information. The copying of material whether parts of sentences, whole sentences,

paragraphs, or entire articles, will result in a grade of zero and can result in further disciplinary action.

Collusion is defined as:

- Collaborating with another, without authorization, when preparing assignments and taking exams/tests.

Getting Started

Be sure to explore the class site at D2L. Use the first couple of days to become familiar with the class site. Remember that this is a GRADUATE level course, and therefore you will be expected to show appropriate levels of effort. You will be expected to take part in discussions in a mature and in-depth manner, to write in a clear and professional voice and you should not need excessive amount of instructor's hand-holding.

Grading Policy

Term paper (see details on next page)	= 100 points
(20 pts. Topic selection & white paper + 80 pts. Term paper)	
Peer-review of Term paper	= 50 points
5 quizzes (10 pts. each)	= 50 points
4 lecture exams (100 pts. each)	= 400 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

Web-based Course This course is partially self-paced. Therefore, it is VERY important to keep up with the material (if you fall behind, there isn't much time to catch up!!!). Students are strongly encouraged to print lecture slides and use them as study guide. Periodically check (daily!!) course homepage as well as your email for course announcements.

Term paper Write a review paper on one of the current research topics related to microbial physiology. Topic selection and white paper is due by **Week 5 (Sept 28)**, and the paper is due by **Week 16 (Dec 11)** Both white paper and term paper need to be prepared in MS word (.doc or .docx) and uploaded to the corresponding "dropbox". Misplaced assignments will not be graded. You have to provide 1- page white paper of your term paper outline along with minimum 3 references **(full-text scientific research papers in PDF format)** covering your term paper topic selection.

- *Contents of the paper:* Discuss a focused "hot topic", with sufficient discussion of background information to allow anyone taking the class to understand the significance. Research approaches and future directions should also be briefly

discussed. The length of the paper is minimum 8 pages of double spaced text (font size no bigger than 12). You can provide figures. 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.
- Categories of term paper topics you can choose from;
  - Life in extreme environment; molecular basis of extremophiles such as;
    - Acidophiles
    - Alkaliphiles
    - Hyperthermophiles
    - Psychrophiles
    - Xerophiles
    - Halophiles
    - And other extremophiles
  - Why oxygen is toxic to anaerobic respirators
  - Molecular basis of radio-tolerant microorganisms
  - ANAMMOX and global nitrogen cycle
  - Biodegradation of aromatic hydrocarbons
  - Bacterial synthesis of biodegradable plastics

  Student may further develop and use a specific sub-topic from each category.

Peer-review You will upload your working draft of term paper by **Week 14** (Nov 27) and start to receive comments and suggestions from your class mates.   You will incorporate those suggestions and recommendations in your finalized term paper. To receive full credit, i) you have to upload your draft by **Nov. 20**, ii) read and provide feedback on minimum 3 drafts of your classmates (due by **Dec. 6**), and iii) update your draft based on your classmates' comments and suggestions.

Exams There will be 4 exams. The exams will consist of multiple choices and short answer & short assay questions. Considerable portion of EXAM questions will be drawn from the same topic pool as quiz pool.

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

Makeup Since there are no actual class meetings or sit-down exam periods, there isn't any necessity for "make-up". All work will have a due date posted. Assignments may be accepted late, but will be penalized heavily on an increasing scale (the later it is, the more point it loses). Please contact me immediately if you are "absent/inactive" long enough to miss any due dates. However, I STRONGLY RECOMMEN planning ahead to avoid such problems. Extreme circumstances will always be taken into consideration; talk to me before you assume anything.

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

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

- o 512 MB of RAM, 1 GB or more preferred
- o Broadband connection required courses are heavily video intensive
- o Video display capable of high-color 16-bit display 1024 x 768 or higher resolution

- You must have a:
  - o Sound card, which is usually integrated into your desktop or laptop computer
  - o Speakers or headphones.
  - o *For courses utilizing video-conferencing tools and/or an online proctoring solution, a webcam and microphone are required.

- 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:
  - o Adobe Reader https://get.adobe.com/reader/
  - o Adobe Flash Player *(version 17 or later)* https://get.adobe.com/flashplayer/
  - o Adobe Shockwave Player https://get.adobe.com/shockwave/
  - o 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.

COMMUNICATION AND SUPPORT

Brightspace Support

Need Help?
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.

Class Schedule
Week 1 (Aug 26)
      Chapter 1- Introduction
      Chapter 2 – Composition and Structure of Prokaryotic cells
Week 2 (Sept 2)
      Chapter 3 – Membrane transport
      Chapter 4 – Glycolysis I
Week 3 (Sept 9)

Chapter 4 – Glycolysis II
Week 4 (Sept 16)
Exam I (Chapters 1-3)
Week 5 (Sept 23)
Topic selection & White paper due (Sept. 28)
Chapter 5 – TCA cycle, electron transport and oxidative phosphorylation I
Week6 (Sept 30)
Chapter 5 – TCA cycle, electron transport and oxidative phosphorylation II
Week7 (Oct 7)
Chapter 6.I – Biosynthesis and metabolism I
Week8 (Oct 14)
Chapter 6.II – Biosynthesis and metabolism II
Exam II (Chapters 4-5)
Week9 (Oct 21)
Chapter 6.III – Molecular basis of microbial growth
Week10 (Oct 28)
Chapter 11 – Photosynthesis
Week11 (Nov 4)
Chapter 11 – Photosynthesis
Week12 (Nov 11)
Chapter 11 – Photosynthesis
Exam III (Chapter 6)
Week13 (Nov 18)
Peer-review (Term paper draft uploading due by Nov. 20; review due by Dec. 6)
Week14 (Nov 25)
Thanksgiving break
Week15
Term paper review due (Dec 6)
Wrap up your term paper
Prepare for Exam IV
Week16
Term paper due: Dec 11
Exam IV (Chapter 11)

All dates and assignments are tentative and subject to change.