**BIOS 3380: Microbiology**

**Syllabus – Fall, 2021**

**This syllabus is subject to change.**

**Lecture: MW 8:00 am- 9:15 am, ES&T L1255**

**Instructors:**

**Joel E. Kostka, Ph.D.,**School of Biological Sciences

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Phone: 404-385-3325; Office hours: M W, 9:15-10:15 am, CE 225 Office hours will be conducted online via Bluejeans https://bluejeans.com/3991790047

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Phone: 404-385-4458; Office hours: W F, 9:30-10:30 am. Office hours will be conducted online via Bluejeans [https://bluejeans.com/1198689050 (Links to an external site.)](https://bluejeans.com/1198689050)

**Teaching Assistant:**

Siu Lung Ng

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Office hours: T, W 4 pm to 5 pm.  Sessions will be conducted on Bluejeans via  [https://bluejeans.com/6758632436 (Links to an external site.)](https://bluejeans.com/6758632436)

Ashika Ram

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Office hours: M, Th 5 pm to 6 pm.  Sessions will be conducted on Bluejeans via [this link (Links to an external site.)](https://gatech.bluejeans.com/220148484/7527)

**Course description:**BIOL3380 course provides an in-depth overview of microbes and the interactions of microbes with ecosystems. Specific topics will include microbial structure/function, diversity, physiology, metabolism, genetics, ecology, evolution and pathogenesis. The course format will consist of interactive lectures, which will draw on information from the textbook and the latest scientific discoveries in the field of microbiology.

**Textbook:**

Brock Biology of Microorganisms, 16th Edition

By Michael T. Madigan, John M. Martinko, Kelly S. Bender, Daniel H. Buckley, David A. Stahl, Thomas Brock

This course will use the online teaching and learning platform, Mastering Microbiology.  Please order the e-text along with the Mastering Access Code according to the information below.

Order information

ISBN: 9780135845684, Modified Mastering Standalone Access Code with eText for Brock Biology of Microorganisms, 16th edition

Additional reading material will be announced and added to the course website on Canvas.

**Prerequisites** (all require a minimum grade of “D”:

BIOS 1107 and (BIOS 1107L and 1207L) or BIOL 1510 or BIOL 1511,

CHEM 2311, Organic Chemistry I

**Course Learning Outcomes**

By the end of this course, you will be able to:

1. Comprehend the ubiquity and enormous diversity of microorganisms on Earth.
2. Be aware of the critical role that microbes play in human society, by providing essential ecosystem services as well as by causing disease.
3. Understand the cellular structures, adaptations, metabolisms, and environmental controls that determine the success of microorganisms in nature.
4. Critically read the primary literature and interpret experimental results.
5. Explain how microbes underpin ecosystem functioning.
6. Understand the mechanisms by which microbial and viral genomes replicate and evolve, and the consequences of their evolution for ecosystem function and human health.

**Course Modality Information**

BIOS 3380 will use a residential mode. This means that students will be expected to attend course lectures in-person every Monday and Wednesday during the semester. Course participation will be assessed using Learning Catalytics.  In addition, you will be expected engage in the course by performing assignments in Mastering Microbiology.  Mastering Microbiology and Learning Catalytics are directly linked to Canvas for your convenience.

**Grading:**

Four exams - 45 %

Six homework assignments - 45 %

Class participation- 10 %

There will be **THREE**(3) lecture exams and one (1) **FINAL EXAM**.  The final exam will not be comprehensive and will cover lecture material after exam 3 only. All four exams together comprise 45 % of your final grade.  All exams will be closed book and will consist of multiple-choice, short answers and essay questions.   Any missed exam will count as 0 and cannot be dropped if missed without documentation. Make-up exams will be different than the original exams. Homework assignments will comprise 45 % of the final grade.  **SIX (6) HOMEWORK ASSIGNMENTS** will be spaced evenly throughout the semester.  Each homework assignment will comprise 7.5 % of the final grade.  Homework assignments will include reading the primary literature on the latest discoveries in the field of microbiology, then answering questions based on your reading.  Answers to homework questions will generally require a close reading of the text and an understanding of the concepts covered in class.  You will be free to use whatever resources are necessary (excluding your classmates) to help you answer the homework questions.  Homework assignments will be made available on Mastering Microbiology and then submitted online, generally one week after the assignment is made available.

Course participation will be assessed using Learning Catalytics (LC) during live synchronous class sessions.  Questions will be initiated by the instructor throughout the duration of each synchronous class broadcast.  Class participation will be evaluated by an equal number of points spread evenly throughout all of the synchronous sessions.  The total number of participation points will be greater than that allotted for each class period.  That way, if you miss a few classes, you will not be penalized. Conversely, if you participate in every class period, you will receive extra credit.  Total LC participation points will make up 10 % of your final grade.

We realize that the ongoing public health situation challenges all of us.   If you become sick, please email your instructors as soon as you are able.

**Grading scale:**

100-90% = A

89-80% = B

79-70% = C

69-60% = D

<60% = F

**Expectations:**

Students are responsible for understanding the material covered in class sessions. Students are expected to read the assigned chapters prior to class to aid in their understanding and participation during lectures. Lecture information will NOT come entirely from the textbook.  Students are also responsible for knowing the material covered in the lectures, **even if it has not been covered in the textbook, *Brock Biology of Microorganisms***. It is the responsibility of the student to obtain any missed information, instructions or materials that results from a missed lecture. Students are also expected to be proactive, meeting online with their TA or instructors should they encounter difficulties in the class, require assistance or have any unanswered questions. Students are also responsible for knowing the material in the relevant assigned chapters of the textbook *Brock Biology of Microorganisms,* **even if it has not been covered in the lecture**.

**Lecture pdfs posted on Canvas are only an outline.** Lecture Powerpoint presentations will be posted on Canvas either before or after lecture (at instructor discretion), but always before the respective exam. Additional material may be covered in lectures, and you may be tested on it.  Lectures will also be recorded on Bluejeans and posted to the media portion of Canvas.

**This course moves fast and covers a lot of material.** This is necessary given the objectives and scope of the course, and to prepare you for microbiology courses in graduate or professional school.  **We encourage you to ask questions!**

**Classroom policies:**

**Consideration:**

**Excuses and Make-up Exams:** Documentation of excused absence must be obtained through the Office of the Dean of Students ([http://deanofstudents.gatech.edu (Links to an external site.)](http://deanofstudents.gatech.edu/)) and provided by the class period immediately following the exam missed. Valid excuses include: personal emergencies such as being hospitalized, or being in a car accident, excused absence due to official school event, family event over which you do not have control, such as a funeral.

If you have a valid excuse, you can make up the exam during the instructor’s office hours (or at another pre-arranged time) within 3 days of the missed exam. Please note: if you do not have a valid excuse, you will receive a 0 for that exam.

**Late or Missed Assignments:** 20 % of total points will be deducted by the Mastering Microbiology tool each day for late assignments, after the class period on the day that they are due.  If you have a valid excuse, you will be allowed to skip one assignment.  However, your assignment grade will then be determined based on the remaining 5 assignments instead of 6.

**Regrade requests:** Any request for a reconsideration of the grading of a question on an exam, quiz, or problem set must be submitted by email to either Dr. Kostka or Dr. Rosenzweig in writing. This request must include a clear explanation of why you think your answer should be considered correct.

**Academic Integrity:**

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards.  For information on Georgia Tech's Academic Honor Code, please visit [http://www.catalog.gatech.edu/policies/honor-code/ (Links to an external site.)](http://www.catalog.gatech.edu/policies/honor-code/)  or [http://www.catalog.gatech.edu/rules/18/ (Links to an external site.)](http://www.catalog.gatech.edu/rules/18/) .

Any student suspected of cheating or plagiarizing on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations.

**Accommodations for Students with Disabilities:**

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services at (404)894-2563 or [http://disabilityservices.gatech.edu/ (Links to an external site.)](http://disabilityservices.gatech.edu/) , as soon as possible, to make an appointment to discuss your special needs and to obtain an accommodations letter.  Please also e-mail your instructors as soon as possible in order to set up a time to discuss your learning needs.

**Campus Resources for Students:**

In your time at Georgia Tech, you may find yourself in need of support. Below you will find some resources to support you both as a student and as a person.

**Academic support**

* Center for Academic Success [http://success.gatech.edu (Links to an external site.)](http://success.gatech.edu/)
  + 1-to-1 tutoring [http://success.gatech.edu/1-1-tutoring (Links to an external site.)](http://success.gatech.edu/1-1-tutoring)
  + Peer-Led Undergraduate Study (PLUS) [http://success.gatech.edu/tutoring/plus (Links to an external site.)](http://success.gatech.edu/tutoring/plus)
  + Academic coaching http://success.gatech.edu/coaching
* Residence Life's Learning Assistance Program

[https://housing.gatech.edu/learning-assistance-program (Links to an external site.)](https://housing.gatech.edu/learning-assistance-program)

* + Drop-in tutoring for many 1000 level courses
* OMED: Educational Services ([http://omed.gatech.edu/programs/academic-support (Links to an external site.)](http://omed.gatech.edu/programs/academic-support))
  + Group study sessions and tutoring programs
* Communication Center ([http://www.communicationcenter.gatech.edu (Links to an external site.)](http://www.communicationcenter.gatech.edu/))
* Individualized help with writing and multimedia projects
* Academic advisors for your major

[http://advising.gatech.edu/ (Links to an external site.)](http://advising.gatech.edu/)

**Personal Support:**

Georgia Tech Resources

* The Office of the Dean of Students: [http://studentlife.gatech.edu/content/services (Links to an external site.)](http://studentlife.gatech.edu/content/services); **404-894-6367**; Smithgall Student Services Building 2nd floor
  + You also may request assistance at [https://gatech-advocate.symplicity.com/care\_report/index.php/pid383662? (Links to an external site.)](https://gatech-advocate.symplicity.com/care_report/index.php/pid383662?)
* Counseling Center: [http://counseling.gatech.edu (Links to an external site.)](http://counseling.gatech.edu/); **404-894-2575**; Smithgall Student Services Building 2nd floor
  + Services include short-term individual counseling, group counseling, couples counseling, testing and assessment, referral services, and crisis intervention. Their website also includes links to state and national resources.
  + *Students in crisis may walk in during business hours (8am-5pm, Monday through Friday) or contact the counselor on call after hours at****404-894-2204****.*
* Students’ Temporary Assistance and Resources (STAR): [http://studentlife.gatech.edu/content/need-help (Links to an external site.)](http://studentlife.gatech.edu/content/need-help)
  + Can assist with interview clothing, food, and housing needs.
* Stamps Health Services: [https://health.gatech.edu (Links to an external site.)](https://health.gatech.edu/); **404-894-1420**
  + Primary care, pharmacy, women’s health, psychiatry, immunization and allergy, health promotion, and nutrition
* OMED: Educational Services: [http://www.omed.gatech.edu (Links to an external site.)](http://www.omed.gatech.edu/)
* **Women’s Resource Center:**[**http://www.womenscenter.gatech.edu** (Links to an external site.)](http://www.womenscenter.gatech.edu/)**; 404-385-0230**
* **LGBTQIA Resource Center:**[**http://lgbtqia.gatech.edu/** (Links to an external site.)](http://lgbtqia.gatech.edu/)**; 404-385-2679**
* **Veteran’s Resource Center:**[**http://veterans.gatech.edu/** (Links to an external site.)](http://veterans.gatech.edu/)**; 404-385-2067**
* **Georgia Tech Police:404-894-2500**

**Statement of Intent for Inclusivity**

As members of the Georgia Tech community, Drs. Kostka and Rosenzweig are committed to creating a learning environment in which all of our students feel safe and included.  Because we are individuals with varying needs, we rely on your feedback to achieve this goal.  To that end, we invite you to enter into dialogue with us about the things we can stop, start, and continue doing to make our classroom an environment in which every student feels valued and can engage actively in our learning community.

**Syllabus change policy:**

Syllabus changes substantially affecting the grading of the course will not be made. \*\***Other syllabus changes may be made and will be announced on class and via email.\*\***Such changes may include a revision of the lecture schedule to accommodate breakthrough discoveries, or the need to move at a slower pace through what proves to be especially challenging material.

**Requirements and Guidelines Specific to Fall 2021**

The fall semester 2021 is especially challenging due to the Covid-19 pandemic.  The following information relates to specific services and guidelines for courses during this semester.  The most up-to-date information on Covid-19 is on the [TECH Moving Forward (Links to an external site.)](https://health.gatech.edu/coronavirus) website and in the [Academic Restart Frequently Asked Questions (Links to an external site.)](https://provost.gatech.edu/academic-restart-frequently-asked-questions).

**Expectations and Guidelines**

Each of us has a responsibility to ourselves and our fellow Yellow Jackets to be mindful of our shared commitment.

This is an unprecedented time. We all agree that the best way for you to learn is face-to-face. If we are required to move to an online format because of a covid outbreak, we are able to help you learn the course content remotely. Whether we meet in-person versus remotely could change depending upon health status of individuals in classroom. You have a definite stake in your personal health and the community’s health.

Our expectation is that everyone who is eligible will be vaccinated; vaccination significantly reduces likelihood of severe disease, including from the delta variant of SARS-CoV-2. Because the delta variant can be spread by vaccinated individuals, we also expect that everyone who is able to should wear a mask, correctly covering mouth and nose, when indoors. Both of these expectations are based on current CDC guidance. As that guidance is updated, we will communicate any new expectations.

Weekly asymptomatic surveillance testing should be part of everyone's regular routine, regardless of vaccination status. Details are here: [https://health.gatech.edu/coronavirus/testing (Links to an external site.)](https://health.gatech.edu/coronavirus/testing).

**Instructor Illness or Exposure to Covid-19**

During the fall 2021 semester, some faculty members may be required to quarantine due to exposure or isolate due to a Covid-19 diagnosis. Some disruption to classes or services is inevitable, but Georgia Tech is making every effort to ensure continuity of operations. As is the case in any semester, faculty may cancel a class if they have an illness or emergency situation and cover any missed material at their own discretion. If an instructor needs to cancel a class, they will notify students as early as possible.

Faculty who are staying home due to symptoms will monitor their health closely and consult with their school chair to determine if remote instruction or substitute instruction is most appropriate for the course. If they need to cancel a class repeatedly, a backup will be supplied in the form of a temporary substitute instructor or asynchronous work. No course will be canceled after the first class has occurred.

If you have not tested positive but are ill or have been exposed to someone who is ill, please follow the [Covid-19 Exposure Decision Tree (Links to an external site.)](http://health.gatech.edu/coronavirus/decision-tree) for reporting your illness.

**Student Illness or Exposure to Covid-19**

During the semester, you may be required to quarantine or self-isolate to avoid the risk of infection to others.  Quarantine is the separation of those who have been exposed to someone with Covid-19 but who are not ill; isolation is the separation of those who have tested positive for Covid-19 or been diagnosed with Covid-19 by symptoms.

If you have not tested positive but are ill or have been exposed to someone who is ill, please follow the [Covid-19 Exposure Decision Tree (Links to an external site.)](http://health.gatech.edu/coronavirus/decision-tree) for reporting your illness.

During the quarantine or isolation period you may feel completely well, ill but able to work as usual, or too ill to work until you recover.

*Remote courses and remote class sessions during hybrid courses.*Unless you are too ill to work, you should be able to complete your remote work while in quarantine or isolation.

*In-person courses and in-person class sessions during hybrid courses.*When in isolation or quarantine you will be unable to attend in-person course sessions but your instructor may require you either to participate in the course remotely, complete some complementary work that parallels what you are missing in class, or make up some class work when you return.

If you are ill and unable to do course work this will be treated similarly to any student illness. The Dean of Students will have been contacted when you report your positive test or are told that it is necessary to quarantine and will notify your instructor that you may be unable to attend class events or finish your work as the result of a health issue. Your instructor will not be told the reason. The Dean’s office has asked all faculty to be lenient and understanding when setting work deadlines or expecting students to finish work, and so you should be able to catch up with any work that you miss while in quarantine or isolation. Your instructor may make available any video recordings of classes or slides that have been used while you are absent, and may prepare some complementary asynchronous assignments that compensate for your inability to participate in class sessions. Ask your instructor for the details.

**Quick Links Guide to Georgia Tech Covid-19 Resources**

[**Tech Moving Forward** (Links to an external site.)](http://health.gatech.edu/tech-moving-forward):Main Institute site - operational updates, Covid-19 health information,  
FAQs for faculty, staff, and students, and more:

* [**Student Services and Resource Guide** (Links to an external site.)](https://health.gatech.edu/coronavirus/services-guide)[(Links to an external site.)](https://health.gatech.edu/coronavirus/services-guide.)
* [**Covid-19 Institute Operations Updates:** (Links to an external site.)](https://health.gatech.edu/coronavirus/faculty) The most current status updates from Georgia Tech.
* [**Frequently Asked Questions** (Links to an external site.)](https://health.gatech.edu/coronavirus/faqs)**:** Resources, contacts, and answers to Covid-19-related questions.
* [**Academic Restart FAQs** (Links to an external site.)](https://provost.gatech.edu/academic-restart-frequently-asked-questions): Answers to questions about instructional and academic issues.
* [**Covid-19 Health Information** (Links to an external site.)](http://health.gatech.edu/coronavirus/health-information):Prevention, testing, reporting, vaccine, and exposure alerts.
* [**Covid-19 Daily Self-Checklist** (Links to an external site.)](https://health.gatech.edu/coronavirus/daily-checklist):A quick checklist that every Georgia Tech community member should perform before coming to campus each day.
* [**Covid-19 Exposure Decision Tree** (Links to an external site.)](https://health.gatech.edu/coronavirus/decision-tree):What to do if you test positive, have symptoms, or are exposed.

[**Fall 2021 Campus Event Guidelines** (Links to an external site.)](https://specialevents.gatech.edu/campus-events-guidelines): campus guidelines for any gathering other than academic classes, professional education programs, or department meetings.

**CARE Center, Counseling Center, Stamps Health Services, and the Student Center**

These uncertain times can be difficult, and many students may need help in dealing with stress and mental health. The [**CARE Center** (Links to an external site.)](https://care.gatech.edu/) and the [**Counseling Center** (Links to an external site.)](https://counseling.gatech.edu/), and [**Stamps Health Services** (Links to an external site.)](https://health.gatech.edu/) will offer both in-person and virtual appointments. Face-to-face appointments will require wearing a face covering and social distancing, with exceptions for medical examinations. Student Center services and operations are available on the [**Student Center** (Links to an external site.)](https://studentcenter.gatech.edu/) website. For more information on these and other student services, contact the Vice President and Dean of Students or the [**Division of Student Life** (Links to an external site.)](https://studentlife.gatech.edu/).

**Accommodations for Students at Higher Risk for Severe Illness with Covid-19**

Students may request an accommodation through the Office of Disability Services (ODS) due to 1) presence of a condition as defined by the Americans with Disabilities Act (ADA), or 2) identification as an individual of higher risk for Covid-19, as defined by the Centers for Disease Control (CDC). Registering with ODS is a 3-step process that includes completing an application, uploading documentation related to the accommodation request, and scheduling an appointment for an “intake meeting” (either in person or via phone or video conference) with a disability coordinator.

 If you have been approved by ODS for an accommodation, I will work closely with you to understand your needs and make a good faith effort to investigate whether or not requested accommodations are possible for this course. If the accommodation request results in a fundamental alteration of the stated learning outcome of this course, ODS, academic advisors, and the school offering the course will work with you to find a suitable alternative that as far as possible preserves your progress toward graduation.

**Important Georgia Tech Dates:**

|  |  |  |
| --- | --- | --- |
| Monday | 8/23/21 | Classes begin |
| Friday | 8/27/21 | Last day to register and/or make schedule changes |
| Monday | 9/6/21 | Official school holiday |
| Monday, Tuesday | 10/11-10/12/21 | Fall Break |
| Thursday, Friday | 11/24/21-11/26/21 | Official school holiday |
| Friday | 12/6/21 – 12/7/21 | Final Instructional Class Days |
| Monday to Friday | 12/9/21-12/16/21 | Finals week |

**Course Schedule:**

Please note that topics may be modified/ omitted or and exam dates may be changed.  **\*\*Changes will be announced either in lecture or via Canvas.\*\***

|  |  |  |  |
| --- | --- | --- | --- |
| **Week** | **Topic** | **Chapters** | **Instructor** |
|  |  |  |  |
| 1 | Overview of Microbial Life;  8/23 Assign 1 on Mastering | 1 | Kostka |
| 2 | Overview of Microbial Life  8/30 Assign 1 due; Assign 2 on Mastering | 1 | Kostka |
| 3 | Cell Structure and Function  9/7 Assign 2 due | 2 | Kostka |
| 4 | Cell Structure and Function; Review session:  9/8 | 2 | Kostka |
| **Exam 1** | **Wednesday, September 15th** |  | Kostka |
| 5 | Microbial Metabolism | 3 | Kostka |
| 6 | COVID-19 Discussion; Microbial Growth and Its Control  9/27 Assign 3 on Mastering | 4 | Kostka |
| 7 | COVID Controversies; Microbial Growth and Its Control  10/4 Assign 3 due | 4 | Kostka |
| 8 | Bioremediation, microbes and oil spills; Plant Microbiomes  Review session: Wednesday 10/6, 7 pm |  | Kostka |
| **Exam 2** | **Wednesday, October 13th** |  | Kostka |
| 9 | Molecular Information Flow and Protein Processing  10/17 Assign 4 on Canvas | 6 | Rosenzweig |
| 10 | Molecular Information Flow and Protein Processing  10/25 Assign 4 due | 6 | Rosenzweig |
| 11 | Metabolic Regulation, including quorum sensing and global regulation  10/31 Assign 5 on Canvas | 7 | Rosenzweig |
| 12 | Genetics of Bacteria and Archaea  11/8 Assign 5 due | 9 | Rosenzweig |
| **Exam 3** | **Wednesday, November 10th** |  | Rosenzweig |
| 13 | Genetics of Bacteria and Archaea | 9 | Rosenzweig |
| 14 | Microbial Genetics, Genomics and Evolution | 10, 13 | Rosenzweig |
| 15 | Microbial Evolution and Symbioses  11/28 Assign 6 on Canvas | 13, 24 | Rosenzweig |
| 16 | Microbial Symbioses  12/6 Assign 6 due | 24 | Rosenzweig |
| **Exam 4** | **Wednesday, December 15th**  8h00-10h50 |  | Rosenzweig |