BIOLOGY 112 sec. 01: Evolution, Form & Function of Organisms
(CRN 20094)
TR 10:50 a.m. - 12:05 p.m., RITA 101

INSTRUCTOR:
Mrs. Kathleen E. Janech, M.S.
janechk@cofc.edu
(email is the best way to reach me – please make sure to use your CofC email only!) I do my best to reply the same day if the email is received before 5 p.m., but I do not check my emails after 5 p.m. or over the weekend. Also, please include your course number and section number, and don’t email my husband by mistake!

OFFICE LOCATION: 65 Coming St., Rm. 214 (I am on the second floor of this little beige house, just across Coming St. from the loading dock area of RITA). Masks requested, please!

STUDENT HOURS (in-person): Tuesdays 12:30 - 1:30 p.m. ET and Thursdays 3 - 4 p.m. ET. These are optional, and feel free to drop-in to my office (see location above) at any time during the hour, and stay for only as long as you need to. You are also welcome to email me to schedule an appointment at another time or location, including a Zoom meeting, if that is your preference. Please come by (masks requested, please!), introduce yourself and ask questions! I am here to help!

Course Description
This course is intended to be a foundation course for science majors, providing an introduction to evolution, plant form, function, and basic physiology, and animal form, function and basic physiology.

Supplemental Instruction (SI):
Supplemental Instruction, or SI, is a collaborative, peer-assisted group study session, led by a student who has previously successfully completed the course. The SI leader helps students, in weekly sessions outside of class, to develop strategies in order to successfully master the material. More info. can be found at http://csl.cofc.edu/?referrer=webcluster& The SI instructor for this class is Hayley Killin (killinhr@g.cofc.edu). Session times and locations will be announced during class. Attending at least one session each week is highly recommended.
Prerequisites
BIOL 111 and BIOL 111L are prerequisites to BIOL 112. You **MUST** have passed both to be in this class.

Co-requisites
BIOL 112 Laboratory – you **MUST** enroll in a lab section in addition to this lecture.

Required Course Materials

1. **Textbook:** *OpenStax Biology 2e.* This is a FREE, Open Educational Resource available online by going to openstax.org. You are also able to download a PDF version for free from the website as well if you would prefer that. If you would like to have a physical textbook, you can also order that from the website, or go through the CofC Bookstore to buy or rent this text, and the cost ranges from $21 - $45. You do not have to bring it to class, and it does not matter to me what form you have, as long as you have it.

   You will also need the OpenStax book for readings that you will have to do for Bio. Lab (see your lab OAKS page for more details on that).

I will be using material from this textbook, as well as pictures and figures from other sources. You will have access to all of the figures through the recorded Zoom lectures. Please let me know if you have any questions about this. There are self-quizzes in the book that can be great study guides, as well as a variety of interactive links in the online version to help you understand the material. There is a lot of material to cover in this course, and when in doubt, check your notes!

2. **Computer and online access:** All students must have access to a computer equipped with a web camera, microphone, and Internet access. You will be required to download, install and use Respondus Lockdown Browser and Monitor for ALL quizzes and, possibly, some exams, including the Final exam. Prof. Janech will be providing further instructions about this. Resources are available to provide students with these essential tools if they need assistance - please let me know if you need help accessing those resources. ***This is especially important since I am trying to run the course as smoothly as possible, even with the pandemic, and might also be necessary if there are any issues with inclement weather this semester.***

This class will include a variety of online and technology enhanced components to reinforce continuity of learning for all enrolled students, including recorded Zoom lectures.

Online access through MyCharleston to OAKS ([http://blogs.cofc.edu/oaks/students/getting-started/](http://blogs.cofc.edu/oaks/students/getting-started/)) and Voice Thread (through the OAKS course home page) will be essential. You also must regularly check your CofC email, since that is how I will send updates. A helpful website for all things technology at CofC is **Student Instructional Technology Services:** [http://blogs.cofc.edu/sits/](http://blogs.cofc.edu/sits/) **IT also has a chat feature for technology support:** [https://chat.help.cofc.edu/](https://chat.help.cofc.edu/) The Remind app will also be used as a backup communication resource.

Suggested Course Material

**Center for Student Learning** – I encourage you to utilize the Center for Student Learning (CSL) and their academic support services for assistance with study strategies and course content. They offer tutoring, Supplemental Instruction, Study Skills appointments, and workshops that help students of all abilities become more successful throughout their academic career. Services are available to you at no additional cost. For more
information, please visit the CSL website at http://csl.cofc.edu, or call (843) 953-5635, or drop by their location on the first floor of the Addlestone Library.

Recording of Classes (via Zoom)
Each class session this semester will be simultaneously available via Zoom (link will be on the appropriate day in the OAKS course calendar) and recorded via both voice and video recording of slides in order to enable everyone to attend class and keep up with the material, even if they are unable to attend in-person. Although I do not intend to video record anyone but myself, by attending and remaining in this class, you the student consent to potentially being recorded (audio). Recorded class sessions are for instructional use only and may not be shared with anyone who is not enrolled in the class. Please let me know if you have any questions.

Class Delivery Format and Expectations
The College of Charleston is committed to promoting the health and safety of our campus community. To that end, all faculty and students should abide by public health guidelines that include practicing social distancing when possible, wearing a mask covering both nose and mouth while in a classroom, washing or sanitizing hands frequently, and staying home when sick.

I have planned this course to enable all students, whether they are in the classroom or working remotely, to be fully engaged in the learning experience. Before the drop/add deadline, students should decide whether the course plan on the syllabus matches their own circumstance. I will use OAKS to facilitate student access to the course syllabus, course materials, and the gradebook. The expectation is that you will attend class remotely, via Zoom, on any class day that you are not physically present in class. To be successful in this class, you must have regular access to a computer with a reliable high-speed internet connection and computer with a microphone and/or web-cam throughout the duration of this course. Computer failure/unavailability does not constitute an excuse for not completing work by the due dates.

This class will be administered through OAKS, the College of Charleston’s learning management system (http://blogs.cofc.edu/oaks/students/getting-started/). To access OAKS go to http://my.cofc.edu and login to My Charleston. The OAKS icon is the acorn located in the upper righthand corner of the screen. I highly recommend setting up OAKS notifications for yourself, so that the system will send you alerts when items are posted in the course or due dates arise.

If you have any issues with technology, the College offers a number of resources to help you develop your technological competency in general, and specifically within the context of this class. Visit http://blogs.cofc.edu/studentreadinessforonlinelearning/ to access those resources. A helpful website for all things technology at CofC is Student Instructional Technology Services: http://blogs.cofc.edu/sits/ Also, IT has a chat feature to help you with problems: https://chat.help.cofc.edu/ And, if you experience technological problems during the class, please contact me immediately at janechk@cofc.edu.

The College anticipates that some members of the community will fall ill or test positive for the coronavirus, and then be required to quarantine thereby missing class, assignments, and assessments. Faculty are expected to provide reasonable accommodations as determined by the content, level, and expectations of their courses for students who become ill or indicate a need to isolate themselves. Communication with the instructor will be essential so that alternate plans can be arranged, and it is imperative that, even if ill or in difficult circumstances, the student finds a way to communicate in a timely manner. To the extent possible, arrangements will be made for students with COVID-19 related absences to continue in the class. Faculty are encouraged to make explicit in their syllabus what sorts of accommodations students can expect with respect to
missed course meetings, assignments, and assessments. However, students should be aware that extended absences for any reason cannot be accommodated in every course. Missed assignments and assessments may result in poor or failing grades. If a student is absent from class for an extended period, a withdrawal (W) before the deadline should be strongly considered. In all cases, assigning course grades is the responsibility of the instructor consistent with the grading policy published in the syllabus.

Please check your email regularly as I often send e-mail updates to the class.

Inclement Weather, College Closure, and the Class Schedule

If the College of Charleston closes and members of the community are evacuated due to inclement weather or for any other reason, students are responsible for taking course materials with them in order to continue with course assignments consistent with instructions provided by faculty. Communication with me, either via email or the Remind app, is vital so that adjustments can be made for extremely difficult circumstances. In cases of extended periods of institution-wide closure where students have relocated, instructors may articulate a plan that allows for supplemental academic engagement despite these circumstances.

Teaching Philosophy

I encourage participation and interaction in my lectures and will do my best to create a fantastic learning environment. However, it is not all up to me. I depend on you, the student, to also take an active role in your education (after all, you pay to be here!) by challenging me with questions and participating. I will also help you discover learning resources available to you that will help you throughout your education.

How to Take This Course
(with credit & thanks to, and in memory of, Dr. Conseula Francis)

Any course, in any given semester, is a journey, often to a place you haven’t been before. You may be super excited about the trip, eager to get going and explore the sites. Or maybe you are here because you were told to take this course. Or maybe you are somewhere in-between. Imagine, if you will, that we’re all standing at the base of a mountain. We all have to decide how we’re going to climb it, and you alone can decide the manner of your exploration.

<table>
<thead>
<tr>
<th><strong>Day Hiker</strong></th>
<th><strong>Backpacker</strong></th>
<th><strong>Trailblazer</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>You’re sticking to the trail because you’re certain of where it goes. You want the basics - lists, order of processes, details to memorize. There is nothing wrong with this approach, especially if the material is new to you. A successful day hiker will <strong>take notes</strong> during class, <strong>review their notes regularly</strong>, and use the <strong>textbook for definitions and background information</strong>. A day hiker may do well on quizzes, but they will have to dig a little deeper for exams to really understand the connections between all aspects of the material.</td>
<td>You’re ready to spend a few days on this mountain and you have supplies (prior knowledge, interest, inclination) to help you. You have a grasp of the basics, and are ready to explore beyond them. Backpackers will hone their <strong>note-taking skills</strong> in class, <strong>review their notes and definitions in the textbook regularly</strong>, and really spend time digesting all of the information that is contained in the figures, both those in the lecture Zoom recording and in the textbook. They ask questions</td>
<td>You are blazing your own way, finding new routes up the mountain and new connections between all aspects of the material, things others may not see. You are passionate about, and interested in, not only what and why, but also <strong>how does this connect to other things in the bigger picture</strong>? Trailblazers often use different <strong>colors when taking notes</strong>, and <strong>review their notes regularly</strong>. They often <strong>read related parts in the textbook</strong>, because they really want to understand the whole picture. They <strong>study the figures (from the Zoom recording)</strong>, and really spend time digesting all of the information that is contained in the figures, both those in the lecture Zoom recording and in the textbook. They ask questions</td>
</tr>
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</table>
the material. They will use the resources at the Center for Student Learning (CSL), and be familiar with activities that can help them to incorporate Bloom’s Taxonomy of human cognition as they work toward greater understanding.

of the professor, either during student drop-in hours at the office, by email or by requesting a Zoom meeting. Backpackers know that to succeed, they must approach with effort and learn and grow from their mistakes. They work with resources at the Center for Student Learning (CSL), are working to achieve the higher orders of understanding in Bloom’s Taxonomy of human cognition, and practice recalling material from memory.

recordings and the text) and try to draw them on their own for recall practice and mastery. They ask questions and spend a lot of time with the material. For trailblazers, this course is part of the expedition to discover all that science has to offer. They take advantage of EVERY opportunity to learn from their mistakes. They often make use of resources at the Center for Student Learning (CSL), actively work with the material to achieve the higher orders of understanding in Bloom’s Taxonomy of human cognition, and often quiz themselves and those that they study with, because they know that practicing information recall from memory as often as possible is one of the best ways to learn.

No matter which path you choose, remember that all explorers need to do their best to limit outside distractions. Yes, life happens, and the current situation with coronavirus is challenging, but really try to give your brain the gifts of time and focus - try to find a good work space & a routine that works for you.

Course Policies and Requirements

Accommodations
Any student in this class who has a documented disability should speak to me as soon as possible, as well as contact the Center for Disability Services (CDS/SNAP program), located on the first floor of the Lightsey Center, Suite 104, http://disabilityservices.cofc.edu/ (843) 953-1431, SNAP@cofc.edu

Additionally, students are welcome to contact Prof. Janech to discuss any religious accommodations needed.

Class Attendance
I expect students to attend all meetings of this course. If you are unable to attend for any reason (including, but not limited to, illness of any kind or not being comfortable sitting in a close classroom) then you are expected to access the course material either remotely during class time via the live Zoom link posted on OAKS, or you may watch and listen to the recording later (once I post it on OAKS), take notes and ask me any questions you may have. Exams will be based almost entirely on lectures with the text used for background information and reinforcement. **You will not do well in this course if you miss lectures. This material is challenging and requires work on your part for success!**

Assignment
One homework assignment will be assigned during the last half of the semester. This assignment is intended to reinforce material covered in class and to encourage critical thinking. It will require you to seek information from sources outside of class and in addition to your textbook. Due date is given on the course calendar below. **Because of the assignment and other REAL opportunities to EARN credit in this course, I do not offer any**
extra credit projects. All students are expected to turn in their INDEPENDENTLY COMPLETED assignment by 5 p.m. on the due date. An assignment will lose one full letter grade for every day of delay (any time after 5 p.m. counts as the next day). You should hold onto all graded assignments until the final grade has been turned in.

Discrimination & Harassment
CofC is committed to providing an environment free of all forms of prohibited discrimination, including sexual harassment and violence (i.e. sexual assault, domestic and dating violence, and gender or sex-based bullying and stalking). If you have experienced any form of discrimination or harassment, help and support are available. Please be aware that CofC employees, other than designated confidential resources, are expected to report information they receive about prohibited discrimination, including sexual harassment and sexual violence. This means that if you tell me about a situation involving sexual harassment, sexual violence, discrimination, or harassment, I must share the information with the Title IX Coordinator. You may speak to someone confidentially by contacting the Office of Victim Services at 843-953-2273, Counseling and Substance Abuse Services at 843-953-5640, or Student Health Services at 843-953-5520.

Honor Code
Students are required to adhere to the guidelines outlined by the Honor Board in the Student Handbook (please see http://deanofstudents.cofc.edu/policies-and-procedures/honor-code-and-code-of-conduct.php) This includes lying, which will not be tolerated in this course. All work that you turn in for this course (whether for assignments, quizzes, or exams) must be your own independent scholarship. Students should be aware that unauthorized collaboration—working together without permission—is a form of cheating; this includes collaborating with classmates or other individuals on online quizzes or exams. Other forms of cheating include possessing or using an unauthorized study aid (which could include accessing information via a cell phone or computer), copying from others’ exams, fabricating data, and giving unauthorized assistance. Any form of plagiarism (intentional and unintentional), cheating, or presenting someone else's work as one’s own will be treated as a serious academic transgression and will be communicated accordingly by the instructor as an honor code violation to Student Affairs. Be especially cautious of plagiarism when using Internet sources. Cheating, attempted cheating, or plagiarism will result in a grade of zero on that assignment, quiz or exam and may result in a final overall grade of F or XXF (failure due to academic dishonesty) for the course.

Quizzes
Several short quizzes will be given throughout the semester on OAKS. They are intended to assist students in keeping up with the large amount of information in this course by encouraging them to prepare and study/read/review EVERY day. It is your responsibility to keep up with due dates and times! Lockdown Browser and Monitor will be required to be used for each quiz. Quizzes will open at least one or two days before the day that they are due, and close at 5 p.m. on the day that they are due! A missed quiz will result in a 0 for that quiz, unless you talk to me to explain the situation (serious illness, including but not limited to COVID-19, family responsibilities, other extreme circumstances). The College will no longer be using Absence Memos, so it is imperative that you communicate with me and tell me the truth, so that I can work with you. Your lowest quiz score will be dropped in the final grade calculation. All cell phones, smart watches, headphones, ear buds, pagers, iPods, iPads, tablets, laptops, etc. are to be turned off and put away during each quiz, and you are expected to take them BY YOURSELF without other people, notes, books or websites. The use of any wireless communication device during a quiz, test, or final exam is a violation of the Honor Code.
**Exams**

In this course, there are 4 regular exams scheduled during the semester (see calendar below for dates) and 1 cumulative final exam scheduled during the final examination period. I plan to give exams in-person, in class, using Akindi sheets for you to “bubble in” your answers. I will provide more information during class. Anyone who misses an exam will receive a 0, **UNLESS** you talk to me ASAP to explain the situation (serious illness, including but not limited to COVID-19, family responsibilities, other extreme circumstances). If you email/talk to me about it, there is a chance that I could accommodate you at the same exam time and possibly allow you to take it online, using Respondus Lockdown Browser and Monitor. If you take your exam after the rest of the class, there will be a 10 point deduction penalty. The College will no longer be using Absence Memos, so it is imperative that you communicate with me and tell me the truth, so that I can work with you. If you have any conflicts with the scheduled exams, you must email me to discuss ahead of time, well before the exam date. The final exam will be given online through OAKS, and will require the use of Respondus Lockdown Browser and Monitor (you are expected to take it BY YOURSELF without other people, notes, books or websites). All cell phones, smart watches, headphones, ear buds, pagers, iPods, iPads, tablets, laptops, etc. are to be **turned off and put away completely** during each exam. The use of any wireless communication device during a quiz, test or final exam is a violation of the Honor Code.

**Grading**

The quizzes will count for a total of 15% of your final grade. The assignment will count for 10% of your final grade. The 4 regular exams will count for a total of 60% of your final grade. The cumulative final exam will count for 15% of your final grade. Grade calculation formula (try for yourself in an Excel spreadsheet):

\[
[(\text{Quiz avg.}) \times 0.15] + [(\text{Assign.}) \times 0.10] + [(\text{Exam avg.}) \times 0.60] + [(\text{Final exam score}) \times 0.15] = \text{Final grade}
\]

The following quote is just a reminder that whether you come into this course with lots of prior knowledge or not, work on your part will be the key to your success!

**“Hard work beats talent when talent doesn’t work hard” – Tim Notke**

Letter grades will be determined by the following breakdown:

- $\geq 93\% = A$
- $90-92 = A-$
- $87-89 = B+$
- $83-86 = B$
- $80-82 = B-$
- $77-79 = C+$
- $73-76 = C$
- $70-72 = C-$
- $67-69 = D+$
- $63-66 = D$
- $60-62 = D-$
- $\leq 59 = F$
- 0 due to acad. dishonesty = XXF

Please teach yourself how to check on your grade in this course on OAKS, and follow along during the semester. Any errors can be brought to my attention, and are much easier to fix the sooner they are detected!

**My Expectations of Students in my class:**

1. **Proper Deportment:** In this class, you are expected to be respectful of your teacher and other students. Talking, texting and non-course related phone & computer use are prohibited. If you need to do these things, please leave the room until you are finished. Help me create a learning-focused environment for you and everyone around you – please be courteous and pay attention! If you have a question, please ask me – I love questions from students! I respectfully request that you properly wear a mask at all times while in the classroom, no matter what your vaccination status is.
2. Electronic device policy - (please note that I am trying to be more flexible about this, but I really do prefer that students handwritten their notes! Studies have shown retention of the information is better this way!) However, I understand that for many students, especially given the current circumstances of the pandemic, it makes sense to use an electronic device. Laptops will be allowed, but if possible, a flat tablet with a writing stylus is preferred. Research has shown that learning is negatively affected when students and those around them use phones or other devices during class. Therefore, because we all deserve a learning-focused environment, the use of wireless communication devices (phones and smart watches) during class is prohibited, other than to respond to a Cougar Alert announcement - therefore please SILENCE all cell phones, pagers, iPods, iPads, tablets, laptops and anything with alarms before coming into my class AND PUT THEM AWAY. If you forget to do so you RISK BEING PERSONALLY REMINDED DURING CLASS and you may be asked to leave and not to return that class period. Class time will be packed with information, and I do not want you or any students around you to be distracted. Remember that you can access all of the material later on the Zoom recording. Please DO NOT take photos of my slides (except for long announcements) - you need to write your notes. They will be accessible in the Zoom recording posted later as well.

3. This is a large class, and it will take me some time to learn your names. However, I have an excellent memory and I can see everyone, even in such a large classroom, so please stay awake, participate and be attentive. It is important that you start presenting yourself as a serious, professional student when dealing with faculty and other students in the class. One day you will be asking for letters of recommendation – start thinking now about what you want those letters to say about you, and act accordingly.

4. Lockdown Browser and Monitor reminders: Lockdown Browser and Monitor (LDB) is required to be used to take each quiz, exam (if applicable) and Final Exam in OAKS. This is done to assist you, and ALL students in the class, with abiding by the Honor Code in an online testing environment. The LDB software will record video and audio of you while you are taking the quiz or exam, and it uses artificial intelligence to flag suspicious behavior. NO ONE will be “watching” you while you are testing. The system alerts me when behavior is flagged, and I can go in to see and hear what happened. If you know that something out of your control happened during the recording, you are welcome to email me and let me know once you are done testing. If I do not find evidence of ACTUAL suspicious behavior (for example, the system said it could not detect your face when all that happened was your mouth and nose were covered by a mask), then I will note that and you will not hear anything from me. However, if I do see or hear suspicious behavior, there will be the following consequences: 1. For the first incidence, you will receive a warning email from me, with an expectation that the behavior will not happen again. 2. If you are flagged a second time for suspicious behavior, after already receiving a warning, then 10 points will be deducted from your grade for that quiz or exam. 3. If you are flagged a third time, you will receive a grade of 0 for that quiz or exam. More details will be forthcoming and posted on OAKS.

**COURSE CALENDAR**

Exam dates are firm! – but topics covered on certain days are subject to change and I will update this calendar as we go

<table>
<thead>
<tr>
<th>Date</th>
<th>LECTURE TOPIC</th>
<th>Chapter in OpenStax Biology, 2e (provided for reference for definitions and</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>Topic</td>
<td>Reference</td>
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</tr>
<tr>
<td><strong>January</strong></td>
<td><strong>T 11</strong> Welcome, Introduction, Plants and Plant Development</td>
<td>parts of 25 &amp; 26</td>
</tr>
<tr>
<td><strong>January</strong></td>
<td><strong>R 13</strong> Plants and Plant Phylogenetics, Plant Form, Function &amp; Growth</td>
<td>parts of 25, 26 &amp; 30</td>
</tr>
<tr>
<td><strong>January</strong></td>
<td><strong>T 18</strong> Plant Form, Function &amp; Growth <em>Last day to Drop/Add is today!</em></td>
<td>Parts of 30</td>
</tr>
<tr>
<td><strong>January</strong></td>
<td><strong>R 20</strong> Water and Sugar Transport in Vascular Plants</td>
<td>30.5</td>
</tr>
<tr>
<td><strong>January</strong></td>
<td><strong>T 25</strong> Soil &amp; Plant Nutrition</td>
<td>31</td>
</tr>
<tr>
<td><strong>January</strong></td>
<td><strong>R 27</strong> Plant Responses</td>
<td>30.6</td>
</tr>
<tr>
<td><strong>February</strong></td>
<td><strong>T 1</strong> <strong>EXAM 1</strong></td>
<td>See study guide posted on OAKS</td>
</tr>
<tr>
<td><strong>February</strong></td>
<td><strong>R 3</strong> Angiosperm Reproduction</td>
<td>Parts of 32</td>
</tr>
<tr>
<td><strong>February</strong></td>
<td><strong>T 8</strong> Start Evolution by Natural Selection, Evidence for Evolution / <strong>Darwin Week?</strong></td>
<td>Parts of 1.2, 18, 19</td>
</tr>
<tr>
<td><strong>February</strong></td>
<td><strong>R 10</strong> Finish evidence for Evolution, Darwin’s postulates / <strong>Darwin Week?</strong></td>
<td>Parts of 18, 19, 20</td>
</tr>
<tr>
<td><strong>February</strong></td>
<td><strong>T 15</strong> Patterns of Natural Selection, Hardy-Weinberg, Common Misconceptions about Evolution / <strong>Darwin Week?</strong></td>
<td>Parts of 18, 19, 20</td>
</tr>
<tr>
<td><strong>February</strong></td>
<td><strong>R 17</strong> Speciation &amp; human population ecology &amp; human evolution</td>
<td>44.5, 45.5, 45.6</td>
</tr>
<tr>
<td><strong>February</strong></td>
<td><strong>T 22</strong> <strong>EXAM 2</strong></td>
<td>See study guide posted on OAKS</td>
</tr>
<tr>
<td><strong>February</strong></td>
<td><strong>R 24</strong> Animal Development, Animal Form &amp; Function</td>
<td>27, 29, 33</td>
</tr>
</tbody>
</table>

*background) - I test from my lecture material!*

- **Darwin Week?** refers to a special week dedicated to discussing Darwin's theory of evolution.
<table>
<thead>
<tr>
<th>March</th>
<th>The order of these topics might definitely change!</th>
</tr>
</thead>
<tbody>
<tr>
<td>T 1</td>
<td>Animal Development, Animal Form &amp; Function / <em>Midterm grades due to be entered by faculty by noon tomorrow</em></td>
</tr>
<tr>
<td>R 3</td>
<td>Water and Electrolyte Balance in Animals, Nutritional homeostasis - diabetes</td>
</tr>
<tr>
<td>T 8</td>
<td>OFF - Spring Break!</td>
</tr>
<tr>
<td>R 10</td>
<td>OFF - Spring Break!</td>
</tr>
<tr>
<td>T 15</td>
<td>Gas Exchange and Circulation / <em>Daylight Savings Time began on Saturday - clocks spring ahead! Please note that all times listed going forward are Eastern Daylight Savings Time!</em></td>
</tr>
<tr>
<td>R 17</td>
<td>OFF - My classes only!</td>
</tr>
<tr>
<td>T 22 - my classes will not meet in person (room is occupied - entire class will be on Zoom!)</td>
<td>finish Circulation, start Animal Nervous systems</td>
</tr>
<tr>
<td>R 24</td>
<td>Finish Animal Nervous system, start Immune system in Animals - innate immunity and inflammation / <em>Last day for students to withdraw with a grade of “W” is TOMORROW!</em></td>
</tr>
<tr>
<td>T 29</td>
<td><strong>EXAM 3</strong> See study guide posted on OAKS</td>
</tr>
<tr>
<td>R 31</td>
<td>Immune Systems in Animals</td>
</tr>
<tr>
<td>April</td>
<td></td>
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<tr>
<td>T 5</td>
<td>Immune Systems in Animals - vaccines and viruses</td>
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</tbody>
</table>
** Please note: as stated in the Undergraduate Catalog:

http://catalog.cofc.edu/content.php?catoid=14&navoid=671#final-examinations

“Examinations must be taken at the time scheduled (https://registrar.cofc.edu/pdf/exam-schedule-spring2022.pdf), except when:
1. Two or more exams are scheduled simultaneously.
2. Legitimate AND documentable extenuating circumstances prevent the student from completing the examination at the scheduled time (e.g., burial services for an immediate family member).”

**Learning Goals and Objectives**

**Learning Goals & Objectives for Biology 111 and 111L Introduction to Cell and Molecular Biology/ BIOL 112 & 112L Evolution, Form, and Function of Organisms**

Department: Biology

This general education science sequence provides a background for understanding and evaluating contemporary topics in biology. Students develop a foundational understanding of core concepts to use and on which to expand in upper level courses. They also develop the critical competencies that form the bases for the practice of science and use of scientific knowledge.

**Core Concepts**

This 2-semester course sequence in general biology addresses fundamental principles in biology to prepare students for sophomore and upper level courses in biology:
EVOLUTION: The diversity of life evolved over time by processes of mutation, selection, and genetic change. The theory of evolution by natural selection allows scientists to understand patterns, processes, and relationships that characterize the diversity of life.

STRUCTURE AND FUNCTION: Basic units of structure define the function of all living things. Structural complexity, together with the information it provides, is built upon combinations of subunits that drive increasingly diverse and dynamic physiological responses in living organisms. Fundamental structural units and molecular and cellular processes are conserved through evolution and yield the extraordinary diversity of biological systems seen today.

INFORMATION FLOW, EXCHANGE, AND STORAGE: The growth and behavior of organisms are activated through the expression of genetic information at different levels of biological organization and depend on specific interactions and information transfer.

PATHWAYS AND TRANSFORMATIONS OF ENERGY AND MATTER: Biological systems grow and change by processes based upon chemical transformation pathways and are governed by the laws of thermodynamic and will be explored to understand how living systems operate, how they maintain orderly structure and function, and how physical and chemical processes underlie processes at the cellular level (i.e. metabolic pathways, membrane dynamics), organismal level (i.e. homeostasis) and ecosystem level (i.e. nutrient cycling).

SYSTEMS: Living systems are interconnected and interacting and biological phenomena are the result of emergent properties at all levels of organization, from molecules to ecosystems to social systems. The course will explore the dynamic interactions of components at one level of biological organization to the functional properties that emerge at higher organizational levels.

The specific topics covered in each course include:

**Biology 111 & Biology 111L**

- Chemical and physical properties of life
- Cell form & function
- Energetics, metabolism, and photosynthesis
- The cell cycle
  - Mitosis and cell reproduction
  - Meiosis and sexual reproduction
- Mendelian genetics / Patterns of inheritance
- Human Inheritance
- The molecular basis of inheritance
- DNA and protein production
- Regulation of gene expression
- Some aspects of biotechnology
The development of evolutionary thinking

Basic evolutionary processes

Comparative plant form & function

Comparative animal form & function

Core Competencies

- **Nature of Scientific Knowledge**
  - Understand the intellectual standards used by scientists to establish the validity of knowledge, evidence, and decisions about hypothesis & theory acceptance. These standards include: 1) science relies on external and naturalistic observations, and not internal convictions; 2) scientific knowledge is based on the testing of hypotheses and theories, which are under constant scrutiny and subject to revision based on new observations; 3) the validity of scientifically generated knowledge is established by the community of scientists through peer review and open publication of work.
  - Understand that new ideas in science are limited by the context in which they are conceived; are often rejected by the scientific establishment; sometimes spring from unexpected findings; and usually grow slowly, through contributions from many investigators.
  - Understand that science operates in a world defined by the laws of chemistry and physics.
  - Understand the differences and relationships among scientific theories, hypotheses, facts, laws, & opinions.
  - Understand the differences between science and technology, but also their interrelations.
  - Understand the dynamic (tentative) nature of science.

- **Scientific Methods of Discovery**
  - [1] Understand the methods scientists use to learn about the natural world (observing; questioning; formulating testable deductive hypotheses; controlled experimentation when possible; observing a wide range of natural occurrences and discerning (inducing) patterns).
  - Apply physical/natural principles to analyze and solve problems.

- **Develop a Scientific Attitude**
  - Develop habits of mind that foster interdisciplinary and integrative thinking (within biology; between biology and other sciences; between science and other disciplines).
  - Develop an appreciation for the scientific attitude - a basic curiosity about nature and how it works.

- **Develop scientific analysis and communication skills**
  - Develop quantitative reasoning skills (quantitatively expressing the results of scientific investigations, or patterns in nature and using knowledge of biological concepts to explain quantitatively-expressed data or patterns).
  - Understand the probabilistic nature of science and the use/application of inferential statistics to test hypotheses.
  - Develop scientific information literacy (library, internet, databases etc…); find and evaluate the validity of science-related information.
○ Communicate scientific knowledge, arguments, and ideas in a variety of different contexts (scientific, social, cultural), utilizing a variety of different media (scientific articles, policy statements, editorials, oral presentations etc.).

○ Develop cooperative problem-solving skills (working effectively in teams), but also habits of mind and skills that foster autonomous learning.

● Develop an appreciation for the impact of science on society.

○ Develop an appreciation of humans as a part of the biosphere and the impact of biological science on contemporary societal/environmental concerns.

○ Knowledge of the history of the biological sciences and the influences of politics, culture, religion, race, and gender on the scientific endeavor.

Signature assignments for measuring learning outcomes

Learning Outcome 1: Students apply physical/natural principles to analyze and solve problems.

This learning outcome is assessed using the poster (or scientific article) generated in Biology 112 lab as part of the multi-week student-directed independent research project. In this project students use data they collect (or has been collected in actual research investigations) to test an hypothesis of their choosing. These projects may be themed, with all student groups addressing different aspects of a larger question, emphasizing the interdependence of various research groups needed to address complicated problems. This multi-week project begins the class identifying what questions need to be addresses in the larger problem. Individual student groups then become experts in these areas of the larger problem. The smaller research teams develop a hypothesis, and write a research proposal to test their hypothesis. Students collect (or use already collected data), summarize and statistically analyze the data, and draw conclusions.

Learning Outcome #2 - Students demonstrate an understanding of the impact that science has on society.

Biology 112 lab Students produce a written document based on one of the case-based labs (examples - policy statement, article, stake-holder professional letter or poster) that requires them to research and apply biological knowledge or evidence to defend or critique a proposed solution to a biology-related societal issue. Although the choice of the specific issue or proposed solution is course-section specific, some examples of potential issues include

- exploring environmental/health impacts of genetically modified organisms
- the use of performance enhancing drugs in sports
- the development of antibiotic resistance in disease organisms

[1] This learning goal will be measured as part of the general education assessment. The specific learning outcome to be measured is: Students can apply physical/natural principles to analyze and solve problems.

[2] This learning goal will be measured as part of the general education assessment. The specific learning outcome to be measured is: Students can demonstrate an understanding of the impact that science has on society.