

Biology 106: The Living City
University of Tennessee, Fall 2017
2:10 – 3:25, Tuesday and Thursday, 415 BU

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Office hours and email: 3:45 – 4:45 pm Tuesday or by appointment. It's best to start with an email with a few day/times you would be able to meet, and I will respond as quickly as I can. When you email, put BIO106 in the subject line and provide me with enough information to answer any questions.

Course website: You will find this course on Canvas. I recommend that you check Canvas frequently for new announcements, schedule changes, and assignments. This is also where you will be able to check your grades.

Course description: More than half the world's population lives in cities and is directly involved in ecological and evolutionary processes governing urban environments. Cities are unique ecosystems that develop novel organismal communities, alter weather patterns, and concentrate resources. We will investigate urban ecosystems, and the health and financial implications for people.

Course Learning Objectives:

This course is organized to meet the goals of the General Education Natural Sciences requirement:

“As science and technology come to play an increasingly important role in contemporary life, it is essential for all educated persons to have a fundamental understanding of science and its methods. All students should be familiar with one or more scientific disciplines and the role of science in contemporary society. Such familiarity may be gained through acquisition of knowledge of a discipline's basic vocabulary, chief discoveries, and fundamental principles; exposure to a discipline's experimental techniques; and the ability to analyze issues with scientific dimensions.”

You should be able to explain the *five big ideas (FBIs)* in biology as they relate to topics covered in this course

1. **Evolution:** Populations of organisms and their cellular components have changed through time by both selective and non-selective processes.
2. **Structure and Function:** All living systems (organisms, ecosystems, etc.) are made of structural components whose arrangement determines the function of the systems.
3. **Information Flow and Storage:** Information (DNA, for example) and signals are used and exchanged within and among organisms to direct their functioning.
4. **Transformations of Energy and Matter:** All living things acquire, use, and release matter and energy for cellular / organismal functioning.
5. **Systems:** Living systems are interconnected, and interact on multiple levels.

You should also be proficient in the following **scientific practices**:

- Formulate empirically-testable hypotheses
- Interpret visual representations of data (figures and diagrams)
- Evaluate data and come to a conclusion based on evidence (formulate an argument)

Recommended Book: Note required. Most readings will be provided as files on Canvas or links to articles.

Adler and Tanner. 2013. *Urban Ecosystems: Ecological Principles for the Built Environment*. Cambridge University Press, Cambridge. 345 pp.

Assessment of Learning: There is a total of 1000 points available during the course. There will be no extra credit unless offered to the entire class. Any excuse or concern for absence or tardy work should be discussed in a timely manner.

Three tests worth 150 points each	450
Homework, In Class Assignments, Quizzes, and Participation	400
Group Paper	150
Total	1000

Grading Scale by percentage of 1000 points

90 – 100 = A	70 – 76 = C
87 – 89 = B+	67 – 69 = D+
80 – 86 = B	60 – 66 = D
77 – 79 = C+	≤ 59 = F

Tests: There are three exams, each worth 150 points. I will provide study guides/lists of keywords and ideas you should know for each exam. We will use Immediate Feedback (IF) testing for a portion (usually 50 points) of each exam. IF testing involves groups of 4 – 5 students working together to answer a set of questions. I'll go over this in more detail before the first exam.

Group Paper: There will be a group paper completed outside of class worth 150 points. There will be several checkpoint assignments due throughout the term. Each group will identify one thing about the urban environment around Knoxville or UT that you think should be improved and then develop a plan to make that change. We will talk about the details in class. Everyone in the group receives the same grade. Point distribution: Topic = **10** points, Literature Cited = **10** points, Outline of experiment = **10** points, Outline of action plan = **10** points, Plan to gain public support = **10** points, and the final paper = **100** pts.

Readings and Videos: There will be several articles and links to videos available on Canvas that will be required for lectures, assignments, and online quizzes. These will be announced in class and on Canvas.

Homework: Throughout the term there will be assignments based on specified readings, videos, or literature searches. For most of these, you will submit your work through Blackboard.

Online Quizzes: Throughout the term there will be quizzes over videos or articles that introduce or cover processes and theories to be covered in upcoming lectures.

Technology: You may only use electronic devices in class for topical applications, only when I say to use them. Off topic use of these devices is not permitted and will result in that device living next to the podium for the remainder of class. **During exams and quizzes, any electronic device seen on your desk or within sight will result in a grade of zero.**

Field Days: Lectures noted as field days will involve time outside and walking. Be sure to wear appropriate clothing and shoes for the weather.

Schedule (subject to change):

Week 1, 24 August:

Lecture 1: Introduction: Class Orientation and Goals

Week 2, 29 & 31 August:

Lecture 2: Ecology. What is a built environment?

Lecture 3: Ecology. Basics of the built environment Field Day.

Week 3, 5 & 7 September:

Lecture 4: Ecology. Intro to Ecology

Lecture 5: Ecology. Intro and goals of Urban Ecology

Week 4, 12 & 14 September:

Lecture 6: Ecology. [Mark Campen, Knoxville City Council](#): Knoxville and the environment.

Lecture 7: The Ecological Footprint of a City *Paper topic due*

Week 5, 19 & 21 September:

Lecture 8: Ecology. Agricultural Selection/Costs of Farm to Table. – [Food Jeffery DeAlejandro, Chef OliBea](#)

Lecture 9: Ecology. Carbon Footprint and Climate Change

Week 6, 26 & 28 September:

Exam 1

Lecture 10: Abiotic Processes. Urban Climate – [Kelsey Ellis, Dept. Geography](#)

Week 7, 3 & 5 October:

Lecture 11: Abiotic Processes. Urban Climate and Water Field Day *Outline of experiment due*

Fall Break

Week 8, 10 & 12 October:

Lecture 12: Abiotic Processes. [Tennessee Valley Authority \(TVA\), Bo Baxter](#) – Dams and water management

Lecture 13: Abiotic Processes. Connections between Organisms and their Environment (Ecology)

Week 9, 17 & 19 October:

Lecture 14: Abiotic Processes. Urban Ecosystems Field Day *Outline of action plan due*

Lecture 15: Biotic Components. Biodiversity and Why are there so many species?

Week 10, 24 & 26 October:

Lecture 16: Biotic Components. [EEB, Orlando Schwery](#) – Biodiversity, Phylogenetics, and The Tree of Life

Lecture 17: Biotic Components. The Tree of Life and What Organisms do in the Environment.

Week 11, 31 October & 2 November:

Lecture 18: Biotic Components. [EEB, Dr. Dan Simberloff](#) – Invasive species

Lecture 19: Biotic Components. Out of class activity *Plan to gain public support due*

Week 12, 7 & 9 November:

Lecture 20: Biotic Components. [TVA, Bo Baxter](#) – Efforts of TVA to Conserve Biodiversity in the TN Valley

Exam 2

Week 13, 14 & 16 November:

Lecture 21: Evolution. Urban to Rural Connections. [Dr. Marcy Souza, UTCVM](#)

Lecture 22: Evolution. Selection on Organisms and Disease in Urban Environments.

Week 14, 21 & 23 November:

Lecture 23: Evolution. Selection on Organisms and Disease in Urban Environments.

Final Paper due Wednesday, 22 November

Thanksgiving

Week 16, 28 & 30 November:

Lecture 24: Evolution/Planning. Infectious Disease and Urban Environments. [Dr. Todd Davis, CDC](#)

Lecture 25: Planning. Knoxville Office of Sustainability. [Erin Gill](#)

Week 17, 5 December:

Lecture 26: Planning. Urban Development and Climate Change. Field Day.

Final Exam

14 December, Thursday, 12:30 – 2:30 PM, in normal classroom.

Academic integrity:

Academic dishonesty of any sort will not be tolerated. Plagiarism includes the copying of phrases, portions of sentences or the main ideas from ANYONE (including a classmate) on ANY work submitted for a grade (exams, assignments, quizzes, etc). Academic dishonesty also includes assisting other students on quizzes or exams.

You are expected to abide by The University of Tennessee honor statement in Biology and in all of your university activities as pledged in the honor code:

“An essential feature of the University of Tennessee, Knoxville, is a commitment to maintaining an atmosphere of intellectual integrity and academic honesty. As a student of the University, I pledge that I will neither knowingly give nor receive any inappropriate assistance in academic work, thus affirming my own personal commitment to honor and integrity.”

(Undergraduate Catalog)

Depending on the offence, penalties for academic dishonesty range from a minimum of a zero for the assignment, to an F for the course, to the filing of formal academic dishonesty charges seeking dismissal from The University of Tennessee. These choices are at the discretion of the instructor, and can occur in either the lecture or the lab portion of the class.

You should be familiar with the requisites of academic honesty and what constitutes academic dishonesty as outlined in the UT Undergraduate Catalog (<http://catalog.utk.edu/>).

Other information**University Civility Statement:**

Civility is genuine respect and regard for others: politeness, consideration, tact, good manners, graciousness, cordiality, affability, amiability and courteousness. Civility enhances academic freedom and integrity, and is a prerequisite to the free exchange of ideas and knowledge in the learning community. Our community consists of students, faculty, staff, alumni, and campus visitors. Community members affect each other's well-being and have a shared interest in creating and sustaining an environment where all community members and their points of view are valued and respected. Affirming the value of each member of the university community, the campus asks that all its members adhere to the principles of civility and community adopted by the campus:

<http://civility.utk.edu/>.

Disability Services:

“Any student who feels s/he may need an accommodation based on the impact of a disability should contact Student Disability Services in Dunford Hall, at 865-974-6087, or by video relay at, 865-622-6566, to coordinate reasonable academic accommodations.

Academic Assistance:

Tutoring: The Division of Biology does not offer tutoring services. Contact the Student Success Center and the Academic Support Unit of The Office of Minority Student Affairs for information about tutoring opportunities.

- Student Success Center: The comprehensive source for information, services, and resources to assist your success at UT: <http://studentsuccess.utk.edu>
 - 812 Volunteer Boulevard, Greve Hall, room 324
 - 865 974-6641, Email: studentsuccess@utk.edu

Technical Assistance:

Canvas, clickers, or general information technology assistance:

- Help Desk: 865 974 9900 (M – F, 8:00 – 5:00) or online at <http://help.utk.edu/>
- OIT Walk-In Help Desk: Commons, 2nd floor Hodges Library
- Turning Technologies (clickers): 866 746 3015

Student Health Center: <http://studenthealth.utk.edu/>

1800 Volunteer Boulevard
865 974-3648

Counseling Center: <http://counselingcenter.utk.edu/>

1800 Volunteer Boulevard
865 974-2196, Email: counselingcenter@utk.edu

OTHER RESOURCES FOR STUDENTS:

- One Stop: <http://onestop.utk.edu> (start here for any question you have)
- Undergraduate Catalog: <http://catalog.utk.edu> (Listing of academic programs, courses, and policies)
- Hilltopics: <http://dos.utk.edu/hilltopics> (Campus and academic policies, procedures and standards of conduct)
- Course Timetable: https://bannersb.utk.edu/kbanpr/bwckschd.p_disp_dyn_sched (Schedule of classes)
- Library: <http://www.lib.utk.edu> (Access to library resources, databases, course reserves, and services)
- Career Services: <http://career.utk.edu> (Career counseling and resources; HIRE-A-VOL job search system)
- Academic planning: <http://advising.utk.edu>

How to be successful in introductory courses

Tips for success

- **Be present** – attend all your classes (lectures, labs, and discussions – every activity in a class was included intentionally to help you learn and is therefore an important part of success in the class!)
- **Be a participant** – engage in learning in class, work with your peers to understand material, take notes in class, ask questions
- **Be perceptive** – your instructor provides clues to success via the content they focus on, activities they have you do, hints they drop in class, and the way they test. Use these cues to be successful in THAT class (which may be different from how to be successful in another class!)
- **Be prepared** – do your homework, take notes on readings (not just highlight them), try to understand things before you go into lecture class
- **Be proactive** – go to office hours and study sessions before exams, stick to a regular weekly or daily study schedule (don't cram), form a study group
- **Be purposeful** – remember your goals for attending college, make adjustments when things don't go right and don't give up

Biggest mistakes

- **Forgetting that meaningful learning takes effort** (it is creating new neural connections in your brain... of course it is hard!)
- **Thinking that intelligence is fixed** (intelligence has no limit and can always be increased over time)
- **Not changing course approach after not doing well on a quiz or exam** (see fixed intelligence above; students give up because they decide they "aren't good at XX")
- **Using passive study approaches versus active testing of knowledge** (re-reading notes or highlighting doesn't build neural connections; studies show that re-writing, re-organizing, and testing yourself are the most effective ways to learn)
- **Studying for memorization instead of application** (many high school courses test for memorization (regurgitation of information) while college exams ask students to apply information to a new problem – this requires a different way of studying (see above!))
- **Thinking that grades in high school determine grades in college** (see above; the ways you are tested will be different, so your studying has to be different; it is basically a clean slate for your GPA)
- **Assuming that multi-tasking in class is no big deal** (every time you switch to a new task requires a pause in brain function, which means you can't re-capture what you missed; plus, your brain literally cannot process two streams of information at one time (no matter how awesome you think you are at it))

- **Skipping labs or not doing online homework** (just because it is a smaller part of the course grade doesn't mean it isn't significant (a loss of 10% means your highest grade is a B+))
- **Being too afraid to ask for help from peers or teachers** (seeing an idea from a different perspective can be the key to understanding)
- **Thinking that college won't be a struggle sometimes** (everyone struggles to reach their potential; that effort is valuable and worth the effort).