



HANYANG UNIVERSITY

2019 HISS Syllabus

Introduction to Biology (BIOLOGY 101)

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Home Univ.: **Georgia** Institute of **Technology** (Georgia Tech)
Dept.: Biological Sciences / Biomedical Engineering

Description: This is an **active-learning** class that introduces students to basic principles of modern biology, including biomacromolecules, bioenergetics, cell structure, genetics, homeostasis, and integrative biology. This course will foster the development of critical scientific skills including hypothesis testing, experimental design, data analysis and interpretation, and scientific communication. Class time will consist of a variety of **team-based activities** designed to discuss, clarify, and apply new ideas by answering questions, drawing diagrams, analyzing primary literature, and explaining medical phenomenon in the context of biological principles. We will spend class time on building your comprehension on the material you find the most difficult, based on pre-class assessment. You will play a prominent role in determining what is the focus of each day's effort.

Objective: Understanding the fundamental principles of human biology.

Preparations: **BIOL 101** will be taught without text book. All course readings and videos are available on the course website (TBD) or will be handed out before lectures.
We will also use an online textbook found at **OpenStax Biology** (open source e-book): <http://openstaxcollege.org/textbooks/biology>

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|-----------|--------|---|
| Schedule: | Week 1 | Lecture 1: Course Introduction –Biological Molecules and Chemistry of Life Lecture 2: Principles of cellular organization in Animals Lecture 3: The Cellular Energetics: Cellular Respiration Lecture 4: Structure/Function of DNA and DNA replication |
| | Week 2 | Lecture 5: Systems biology: The Nervous system and diseases Lecture 6: Systems biology: The Musculoskeletal system and diseases Lecture 7: Practice problems / Review session 1 Lecture 8: MIDTERM EXAM |
| | Week 3 | Lecture 9: Gene expression and control: Transcription & Translation Lecture 10: The Cell cycle Lecture 11: The Cellular Basis of Inheritance: Sexual reproduction and Meiosis Lecture 12: Theory of Evolution and Diversity of Life |
| | Week 4 | Lecture 13: Stem Cells, Development, and Organogenesis Lecture 14: Systems biology: Current topics in Biology Lecture 15: Practice problems / Review session 2 Lecture 16: FINAL EXAM |

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| Evaluation: | Midterm (%) | Final (%) | Attendance (%) | Assignments (%) | Participation (%) | Etc. (%) |
|-------------|-------------|-----------|----------------|-----------------|-------------------|----------|
| | 40 | 40 | 5 | 10 | 5 | |

90-100% (A), 80-89% (B), 70-79% (C), 60-69% (D), ≤ 60% (F)

Exams (Mid-term and Final):

This course has a midterm exam and the cumulative final exam. The midterm exams will be held as “closed-book,” and will be made up of multiple-choice questions based on topics, materials, and discussions presented in class.

Group Projects:

Groups of 4-5 students each will create a short video to explain a fundamental concept related to the course. Each student will be assigned to a group and a topic, and each group will complete only one group project during the semester. Group assignments, details, and deadlines will be provided in class. Video grades have a group and an individual component. The Group Component will be based on instructors’ grades and peer evaluations. The same group project grade will be assigned to all members of a group; each group member is fully responsible for all submitted project work. The group video projects consist of 3 deliverables: a story board, a transcript, and a video posted to *Youtube* or Kakao group chat. The Individual Component includes peer-evaluation of all members of your team and peer-review of a subset of videos from other groups.