

Tompkins Cortland Community College
Master Course Syllabus

Course Discipline and Number: BIOT 101
Course Title: Introduction to Biotechnology

Year: 2023-2024
Credit Hours: 1

Attendance Policy: *To maintain good grades, regular attendance in class is necessary. Absence from class is considered a serious matter and absence never excuses a student from class work. It is the responsibility of all instructors to distribute reasonable attendance policies in writing during the first week of class. Students are required to comply with the attendance policy set by each of their instructors. Students are not penalized if they are unable to attend classes or participate in exams on particular days because of religious beliefs, in accordance with Chapter 161, Section 224-a of the Education Law of the State of New York. Students who plan to be absent from classroom activity for religious reasons should discuss the absence in advance with their instructors. See college catalog for more information.*

Services for Students with Disabilities: *It is the College's policy to provide, on an individual basis, reasonable accommodation to students with disabilities, which may affect their ability to fully participate in program or course activities or to meet course requirements. Students with disabilities should contact the Coordinator of Access and Equity Services, to discuss their particular need for accommodations. All course materials are available in alternate formats upon request.*

Course Description

A survey course for students enrolled in the Biotechnology degree and certificate programs. Career opportunities in biotechnology (modern biology) are discussed. Students map their educational paths to their career objectives. Issues related to intellectual property rights, bio-entrepreneurship, regulations in bio-manufacturing, and bioethics are covered. Employability (soft) skills, including group work and presentation, are developed. Prerequisites: ENGL 099 or prior completion or concurrent enrollment in ESL103; prior completion or concurrent enrollment MATH 090 and RDNG 116 if required by placement testing. 1 Cr. (1 Lec.) Fall and spring semesters.

Course Context/Audience

This course is designed specifically for the Biotechnology A.S. degree and certificate programs, but it is applicable to other biological, natural, forensic, and agricultural sciences majors at four-year institutions. In addition, it is also appropriate for students in non-science degree programs who may want to explore career options in the biotechnology industry relevant to their current associate degree program.

Basic Skills/Entry Level Expectations

Writing: W2 ENGL 099 or prior completion or concurrent enrollment in ESL103 if required by placement testing.

Math: M1 Prior completion or concurrent enrollment in MATH 090 if required by placement testing.

Reading: R3 Prior completion or concurrent enrollment in RDNG 116 if required by placement testing.

Course Goals

As a result of successfully completing this course, the student will be able to:

1. Demonstrate an understanding of the vast impact that biotechnology has on their lives.
2. Assimilate life experiences of those working in the industry.
3. Demonstrate an understanding of the diverse career options available in the biotechnology industry.
4. Formulate a career path relevant to his/her capabilities and desires.

Course Objectives/Topics

Objective/Topic	% Course
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History of Biotechnology	40-5%
Genes and Genomes, Recombinant DNA Technology and Proteins as Products	40-15%
Microbial, Forensic, Agricultural, and Animal Biotechnology	40-20%
Bioremediation, Aquatic, and Medical Biotechnology	40-15%
Regulatory Biotechnology and the FDA	40-5%
Ethics and Biotechnology	40-5%
Guest lectures	5%
Discussion on current topics in biotechnology	15%
Presentation on education & career in biotechnology	20%

General Education Goals - Critical Thinking & Social/Global Awareness

CRITICAL THINKING OUTCOMES	HOW DOES THE COURSE ADDRESS THE OUTCOMES (Include required or recommended instructional resources, strategies, learning activities, assignments, etc., that must or could be used to address the goal/outcomes)
<p>Students will be able to</p> <ul style="list-style-type: none"> ➤ develop meaningful questions to address problems or issues. ➤ gather, interpret, and evaluate relevant sources of information. ➤ reach informed conclusions and solutions. ➤ consider analytically the viewpoints of self and others. 	<p>Basically this is a survey course and their question is; Why am I pursuing the sciences and where do I want to go in my career? Students develop an educational plan and vision of where they want to be in 1, 5, 10 and 20 years. During the course students learn there are a variety of career options available to them in the life sciences. They seek outside resources to explore fields of interest.</p> <p>Students incorporate this career exploration into their educational and career plan. Based on their educational plan and career objectives, students are encouraged to evaluate their ability and motivation to reach their objectives</p> <p>Students read about the application of current technologies and the documented benefits and drawbacks associated with each. Students work in groups discussing current 'hot' topic issues and try to come to consensus on the perceived utility and impact from a scientific perspective.</p> <p>Students present their ideas in concise format based on their reading/research and are open to critique by their peer group. Students work in groups and brain storm ideas among each other as well as hear/learn from the experiences of others. Peer evaluations are conducted to show whether they are on task and succinct in presentation.</p>

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SOCIAL/GLOBAL AWARENESS OUTCOMES	HOW DOES THE COURSE ADDRESS THE OUTCOMES (Include required or recommended instructional resources, strategies, learning activities, assignments, etc., that must or could be used to address the goal/outcomes)
<p>➤ Students will begin to understand how their lives are shaped by the complex world in which they live.</p> <p>➤ Students will understand that their actions have social, economic and environmental consequences.</p>	<p>The impact of science and technology on today's society is discussed. From the advent of biotechnology (fermentation) to the current prospects of cloning (twins). Each week chapter readings cover some aspect of science that had/has profound impact on society. Students begin to appreciate how one's discovery can change man's outlook on life.</p> <p>Students learn to dream/plan how they (as a scientist) will change/save the world (good or bad). Ethical aspects of science are covered. Open discussion permits to students to "push the envelope" and take technology to another level. Students critique the ramifications of technology and impact on society.</p> <p>The idea that profit is not bad if used for good is discussed. Business has to make money to employ people to buy goods and services. Science and technology are the engines that drive economic development. Students develop a business venture based on their concept. They must incorporate all aspects of a business into their plan. They are asked to explore going global with their business (sales or workforce).</p> <p>The regulations required of the life science industry (FDA, USDA, EPA, etc) are covered demonstrating our commitment to the safety and quality of manufactured goods. Students must address in their business plan any aspect of their product that may require federal regulation or long term study.</p>

Instructional Methods

Introduction to Biotechnology is designed as a survey course for individuals interested in the biotechnology industry. Guest speakers who will present their life experiences working in related areas of biotechnology should be scheduled. The guest lectures are intended to provide a basis on which students can plan and assess their individual career paths. The course material on historical developments in molecular biology and biotechnology will provide students with a knowledge base about the field. In addition, appropriate record keeping, standard operating procedures, and federal regulations should be emphasized.

Methods of Assessment/Evaluation

Method	% Course Grade
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Topic section chapter quizzes	20%
Class discussion and participation	30%
Written reports on educational plan and career path	20%
Presentations on biotechnology	30%

Text(s)

Introduction to Biotechnology (current edition), Thieman and Palladino, Pearson/Benjamin-Cummings Publishing (current publishing date).

Bibliography

Journal of Biotechnology, Elsevier Publishing, monthly journal.

Genetic Engineering News, Mary Ann Liebert publishers, monthly periodical.

Nature-Biotechnology, Nature Publishing Group, MacMillan Press Ltd. weekly periodical.

Other Learning Resources

Audiovisual

No resources specified

Electronic

Web sites: A CUNY Special Initiative V-Institute for Virtual Enterprise <http://ivefinancial.com/get.php?q=index>

BIO-link <http://www.bio-link.org/home/>

Other

Computer access for database searches.

ANGEL course management system where syllabus, course materials and relevant internet links should be posted.