

LEARNING OUTCOME I for BIOTECHNOLOGY KNOWLEDGE		Graduates should be able to demonstrate a broad knowledge of the central themes, principles and technologies of biology as well as a broad familiarity with appropriate supporting areas of science, mathematics, and computer technology					
EXPECTED RESULTS The Major will:		Explain the major components, processes and mechanisms of cellular and molecular biology and genetics	Examine and discuss the impact of gene modification on agricultural, environmental, and medical sciences	Apply commonly used methods and techniques in contemporary biotechnology at the cellular and molecular levels	Interrelate principles from cellular and molecular areas to biotechnology	Propose and use mathematical and chemical-physical principles and their correct applications	Apply appropriate computer software for statistical analyses, database mining, and data presentation.
Laboratory/internship notebooks & reports	BIOL2107, BIOL3300, BIOL3340		BIOL2101, BIOL3300, BIOL3340	BIOL3340	BIOL2107, BIOL3340	BIOL2101	
Laboratory practical proficiency	BIOL3340		BIOL3340	BIOL3340	BIOL3340		
Major papers written	BIOL3380, BIOL4486	BIOL3380, BIOL4486	BTEC3400, BIOL4486	BTEC3400	BIOL3380		
Individual and group presentations	BIOL4486	BIOL4486	BTEC3400, BIOL4486	BTEC3400, BIOL4486	BIOL4486	BIOL4486	
Student exams, quizzes	BIOL2107, BIOL3300, BIOL3340, BIOL3380, BTEC3301	BIOL3340, BIOL3380, BTEC3301	BIOL2101, BIOL2107, BIOL3300, BIOL3340, BTEC3301, BTEC3400	BIOL3340, BTEC3301, BTEC3400	BIOL2107, BIOL3380, BIOL3340	BIOL2101, BTEC3301	

LEARNING OUTCOME I for BIOTECHNOLOGY KNOWLEDGE (continued)		
EXPECTED RESULTS The Major will:		Cite appropriate regulations associated with biotechnology industry and laboratories
A S S E S S M E N T M E T H O D S	Laboratory/internship notebooks & reports	
	Laboratory practical proficiency	
	Major papers written	BTEC3400
	Individual and group presentations	BTEC3400
	Student records	BTEC3301, BTEC3400

LEARNING OUTCOME II for BIOTECHNOLOGY SKILLS		Graduates should be able to demonstrate an operational understanding of science and how it may be used to explain natural phenomena. Students should recognize science as an epistemological method and be able to conduct and interpret a good scientific investigation.					
EXPECTED RESULTS The Major Will:		Design a scientific investigation which includes identification of variables and formulation of a testable hypothesis	Select and apply reference sources when researching what is known about a problem	Employ and interpret probabilities and statistics in the gathering and analysis of data	Formulate and evaluate scientific arguments	Synthesize and present scientific information	Apply principles from cellular and molecular areas to biotechnology
A S S E S S M E N T M E T H O D S	Laboratory/internship notebooks & reports	BIOL2101, BIOL2107, BIOL3300, BIOL3340	BIOL3340	BIOL2101, BIOL2107, BIOL3300, BIOL3340, BIOL3340	BIOL2101, BIOL2107, BIOL3300, BIOL3340	BIOL2101, BIOL3340	BIOL3340
	Laboratory practical proficiency	BIOL3340	BIOL3340	BIOL3340	BIOL3340	BIOL3340	BIOL3340
	Major papers written		BTEC3400, BIOL4486	BTEC3400	BIOL4486	BTEC3400	BIOL4486
	Individual and group presentations		BIOL3380, BTEC3400, BIOL4486	BTEC3400	BIOL3380, BIOL4486	BTEC3400	BIOL4486
	Student exams, quizzes	BIOL2101, BIOL2107, BIOL3300, BIOL3340	BIOL3340, BTEC3301, BTEC3400	BIOL3300, BIOL3340, BTEC3400	BIOL3340, BIOL3340, BIOL3380, BTEC3301	BIOL2101, BIOL3300, BIOL3340, BIOL3380, BTEC3400	BIOL3340, BIOL3380

LEARNING OUTCOME II for BIOTECHNOLOGY SKILLS (continued)				
EXPECTED RESULTS		Utilize appropriate mathematical skills and chemical-physical principles	Employ appropriate computer software for statistical analyses, database mining, and data presentation	Perform and interpret commonly used methods and techniques in quality control and quality assurance
The Major Will:				
A S S E S S M E N T M E T H O D S	Laboratory/internship notebooks & reports	BIOL3340	BIOL2101	
	Laboratory practical proficiency	BIOL3340		
	Major papers written	BTEC3400	BTEC3400	BTEC3400
	Individual and group presentations	BTEC3400	BTEC3400	BTEC3400
	Student records	BIOL3340, BIOL3380, BTEC3400	BTEC3400	BTEC3400

LEARNING OUTCOME III for BIOTECHNOLOGY ATTITUDES		Graduates should be able to demonstrate an appreciation of science as a human endeavor that influences and is influenced by the social context in which it is practiced. They should assess and choose value systems to guide them in the practice of science and to critique ethical concerns raised by science and technological advances.					
EXPECTED RESULTS The Major will:		Recognize that scientific ideas change over time	Prepare a collaborative approach to problem solving	Rely exclusively on empirical data when dealing with scientific issues	Apply scientific information in making judgments about the impact of biotechnology on agricultural, environmental, and medical sciences	Identify and employ major arguments relevant to ethical issues arising from our understanding of living systems and the practice of biotechnology	Confirm the importance of quality control and quality assurance in biotechnology
A S S E S S M E N T M E T H O D S	Laboratory/internship Notebooks & Reports	BIOL3340	BIOL3340	BIOL2107, BIOL3300, BIOL3340	BIOL3340	BIOL2107	
	Laboratory practical proficiency	BIOL3340	BIOL3340	BIOL3340	BIOL3340		
	Major papers written	BIOL3380, BIOL4486	BTEC3400, BIOL4486	BIOL4486	BTEC3400, BIOL4486	BTEC3400, BIOL4486	BTEC3400
	Individual and group presentations	BIOL4486	BTEC3400, BIOL4486	BIOL4486	BTEC3400, BIOL4486	BTEC3301, BTEC3400, BIOL4486	BTEC3301, BTEC3400
	Student exams, quizzes	BIOL3340, BIOL3380		BIOL2107, BIOL3300, BIOL3340, BIOL3380	BTEC3400	BIOL2107, BIOL3340, BTEC3400	BTEC3400

