

Wartburg College Educational Policies Committee
REQUEST FOR NEW COURSES/COURSE CHANGES

SIGNATURE PAGE

Type of Request (Check one)

☒ **New course** including new special topics (NOTE: attach a course syllabus and statement of rationale. If this is an essential education course, please describe how it will meet the goals of essential education. Syllabus should contain the description, objectives, and requirements of the course, including the factors used to determine the final grade.)

☐ **Change in Existing Course** including course deletions (Complete items on both the right and the left hand columns)

☐ **Program Change**

Course Identification (Prefix/Number)

BI 134

Course Title (35 character limit)

Introduction to Biotechnology

Recommendation

J. Keith McClung

Submitted By

11-19-15

Date

Roy Ventullo

Department Chair

X

Yes

No

Date

Writing Across the Curriculum Coor.

Yes

No

Date

IS 201/DAC Coordinator

Yes

No

Date

Global Multicultural Committee

Yes

No

Date

General Education Committee

Yes

No

Date

Approval

EPC Chair

Yes

No

Date

Dean of the Faculty

Yes

No

Date

☐ EPC recommends this request be reviewed by Faculty Council for Resource Implications

EPC # _____ Page _____

Gen Ed # 12 Page _____

For Existing Courses

Please complete this column with current information AND enter changes in the right hand column.

For New Course Information or Changes to existing courses

Please complete this column

Course Identification (Prefix/Number)	Course Identification (Prefix/Number) BI 134
Course Title	Course Title (35 character limit) Introduction to Biotechnology
Abbreviated Title	Abbreviated Title (15 character limit) Intro Biotech
Course Description	Course Description (35 word limit) Biotechnology of fermentation, plant and animal breeding, pharmaceuticals, treatment of human disease, and forensic science will be investigated. The ethical issues that biotechnology has and will continue to generate will be explored.
Course Credit	Course Credit 1.0
Classroom Hours per term for lab or studio class	Classroom Hours per term for lab or studio class 1 hr 40 minutes
Prerequisite/corequisite requirements	Prerequisite/corequisite requirements None
Enrollment Cap	Enrollment Cap 20 (this is the limit that the lab will hold)
Terms Offered and rotation	Terms Offered and rotation Winter odd years
Grading (A-F or P-D-F)	Grading (A-F or P-D-F) A-F
Wartburg Plan	Wartburg Plan <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Identify which part of the plan: Interconnected: Natural Science
Cultural Immersion Course	Cultural Immersion Course <input type="checkbox"/> Yes <input type="checkbox"/> No
Program Status (Major requirement, minor requirements, program elective, degree elective)	Program Status <input type="checkbox"/> Major requirement _____ <input type="checkbox"/> Minor requirement _____ <input type="checkbox"/> Major elective _____ <input type="checkbox"/> Minor elective _____ <input checked="" type="checkbox"/> General elective <input type="checkbox"/> IC _____
	Effective Dates (Term/Year) Winter 2017

<p>1. Reason for Requested Change: The new course will fill a need for IC: Natural Sceience for Winter Term.</p>
<p>2. In an effort to keep the curriculum as lean and effective as possible, EPC requests that with each new course departments evaluate current offerings. If proposing a new course, what course(s) could be deleted? The IC course BI 132 (Extreme Biology) is being deleted. The person that taught IC course BI 133 (How animals work) left a while ago and no one is planning to teach it. My course BI 416 (Molecular Biology of Caner) was moved to every other year on even years from being taught every year.</p>
<p>3. Resource Implications: IF THIS IS A NEW COURSE, you must provide a list of teaching assignments in the department to demonstrate that no adjunct faculty are required to teach this course. You may also submit a request to delete a course. New courses will not be considered without a clear understanding of faculty resources necessary to offer the course.</p> <p>Since BI 416 was moved to every other year, the funds for that course will be used for this course. In addition, faculty slot time will be slightly reduced (.33). Therefore, no additional resources are needed. Most likely it will save resources since there is a saving of faculty time and BI 416 has an expensive lab.</p>

Interconnected Course Proposal

Course number & title **BI 134, Introduction to Biotechnology**_____

Proposed by **J. Keith McClung**

Date **11-20-15**__

Primary discipline **Biology**_____ Connected discipline **ethics, business**_____

Which requirement does this fulfill? **Natural Science-lab**

Taught by: ☒ **X** one instructor _____ two or more instructors

IC Criteria	Describe for the proposed course
Courses will contain common concepts, content, processes, and resources in two or three disciplines.	Almost every topic in biotechnology listed in syllabus generates an ethical, social, and ecological concerns. Biotechnology by it very creation is a combination of biochemistry, microbiology, virology, molecular biology, business and bioethics.
At least 1/14 or at least one week of the course time will be spent on the link.	>10% per week
IC Goals	Describe for the proposed course
Students will develop an appreciation for the disciplines of the liberal arts through a greater understanding of their interdependence	On each topic, ethical issues will be generated and discussed.
IC Outcomes.	Describe for the proposed course teaching strategies that will be used and ways each of these outcomes will be assessed.
Students will analyze common concepts, content, processes, and resources in two or three disciplines	<ul style="list-style-type: none"> • Lecture • Break-out group discussion during lecture • Group debates <p>Student are require to write a review paper on a specific biotechnology which includes primary literature. The paper will also include the ethical issues this biotechnology, the ethics issues that are generated in a balanced and impartial manner. This will include a draft and rewrite. In addition, exam and quiz questions will address these outcomes.</p>
demonstrate understanding of the connections and contrasts between two or	<ul style="list-style-type: none"> • Lecture • Break-out group discussion during lecture

more disciplines	<ul style="list-style-type: none"> • Group debates <p>Students are required to give an oral presentation that consists of the background on a biotechnology topic, presents the ethical issue it generates, and argue one side. In addition, exam and quiz questions will address these outcomes.</p>
analyze underlying assumptions in the disciplines being studied	<ul style="list-style-type: none"> • Lecture • Break-out group discussion during lecture • Group debates <p>Each student will be responsible for bringing in current biotechnology new article (newspaper, TV, or a news magazine) and in a formal paper compare the article to the original research article. The students will then lead a discussion on their article. In addition, exam and quiz questions will address these outcomes.</p>

SYLLABUS FOR INTRODUCTION TO BIOTECHNOLOGY (BI 134) WINTER 2017

COURSE DESCRIPTION: Man has used biotechnology since the development of fermentation, agriculture, and domestication of animals. The developments in genetic engineering have revolutionized biotechnology into a rapidly growing, multibillion-dollar industry. We will study various aspects of biotechnology and its uses in fermentation, plant and animal breeding, pharmaceuticals, treatment of human disease, and forensic science. Furthermore, the aspects of regulations involving the use of biotechnology, patents on engineered organisms, and possible impact on our society will be discussed. In addition, the ethical issues that biotechnology has and will continue to generate will be explored. A multiplistic approach will be used to introduce bioethics.

The laboratory will be investigative in nature and will allow the students "hands on" experience with biotechnology techniques.

INSTRUCTOR: Dr. J. Keith McClung
OFFICE: Becker Hall of Science (SC) Room 163
OFFICE PHONE: 352-8554
HOME: 352-0698 before 9:00 PM, please
E-MAIL: keith.mcclung@wartburg.edu
OFFICE HOURS: by appointment

TEXT: Introduction to Biotechnology, 3rd Edition (2013) by William J. Thieman
Lab Manual TBA

TIME AND LOCATION:

DISCUSSION: TBA
LABORATORY: TBA
SCIENCE CENTER, NORTH WING (SC) ROOM 110

OJECTIVES FOR THE COURSE:

The course will begin by introducing the students to biotechnical terminology and basic techniques of genetic engineering. The course will then move into various areas of biotechnology (e.g. medicine, agriculture, genome project...) and in each case ethical issues will be raised and the social impact of this technology will be discussed. Topics to be discussed will be as follows:

History of Biotechnology
Transformation
Biosafety
Gene Therapy
Molecular Markers
Bioremediation
Bioterrorism

Genetic Engineering
Biotechnological Products
Cloning
Pharmacogenomics
Forensic DNA
Biodiversity
Bioethics

Using these general topics as a backdrop, students will be challenged to discuss their views on the moral and ethical questions generated by this technology and the possible ecological and social impacts of widespread use of this technology. Questions will be raised and discussed (e.g. Is the risk worth the benefit from this technology or should certain technology not be used because of the ethical, social, or ecological impact the may have?).

STUDENT LEARNING OUTCOMES:

1. Students will be able use correctly biotechnological and genetic engineering terms.
2. Student will be capable of looking for ethical issues that arise with biotechnology and using a mutiplistic approach to resolve and issue (students may not come to the same conclusion or stance.
3. Students will be able to evaluate news media articles and compare that to primary literature.
4. Students will be able to assess social and ecological impact of various biotechnology.

PRESENTATION:

Individual presentations will be on an ethical issue in biotechnology. The student will select a biotechnology topic, present background material, and defend one position. The students will choose the topic based on their review paper and may defend any position, but a clear position needs to be presented. The presentation will be 15 to 20 minutes in length. It will include an introduction, a clear statement of a position as well as supportable defense of the position.

WRITING ASSIGNMENTS:

1. A current biotechnology news article (newspaper or news magazine) will be compared to a research article on the same subject. This will be chose by the student and approved by the instructor. The student will prepare a formal paper of 2 to 3 pages in length. The target audience will be your fellow students. The paper will include an introduction of the subject matter, the importance of the field and this work, and the main hypothesis or question being asked. Furthermore, the paper will include a critic of the news article when compared to the research article. Questions, such as: Were assumptions made in the news article? Was the news article misleading or prophetic: etc. Classmates will review each others articles and the format will be discussed before they are handed in.

2. The **objective** of writing a review paper is to provide an opportunity for a group of students to collect scientific and ethical literature, summarize the findings and present it in written form. In addition, it provides an opportunity to work in teams. This is important because most science is a team effort. The team will consist of two students selected by the instructor. The topic will be selected by the students, but approved the instructor. The topic will involve some ethical issue concerning biotechnology. The paper will include a balanced view of the research material. The paper will include the

following: A **title** with students' name. The **abstract** will include an introductory statement of purpose and a brief description of the main findings in the review, and a conclusion. Its purpose is a stand-alone work. The **introduction** introduces the literature background and the importance of the subject. The **body** includes subtitled sections that summarizes the literature. It needs to be highly organized and in logical order so it naturally flows from one section to the next. The **conclusion** summarizes the key points, indicates the limitations of the existing data, and where the research should or is heading. The paper will require a minimum 15 references of which at least 10 are primary, peer-reviewed. The references will be on a separate page that is not included in your page limitations and will conform to the **The Biology Writing Guide** which will be provided. The title or topic will be due TBA. An outline of the paper will be due TBA. The paper will be due TBA. The paper will be between eight to ten pages, 1.5 spaced, and at 12 point font with one inch margins. To assist in your learning, the instructor will review and critic your review paper provide you turn it into at least one week before it is due.

WARTBURG COLLEGE HONOR CODE

As a matter of personal commitment, students, faculty, and staff of Wartburg College are expected to demonstrate three simple principles:

- 1) All work submitted be your own.
- 2) When using the work or ideas of others, including fellow students, give full credit through accurate citations.
- 3) Maintain academic honesty both on examinations and class assignments.
- 4) If you are uncertain about the ground rules on a particular assignment, ask for clarification.

All are responsible for abiding by these guidelines and opposing academic dishonesty by reporting any act that goes against these guidelines.

Any form of blatant cheating or plagiarism will result in the grade of **F** for the course. In science, one dishonest mistake may result in the end of one's career; therefore, no dishonest work will be tolerated. As part of the course design, students will be introduced to ways of assuring honest reporting of work. This includes manuscripts, lab reports, or presentations.

Accommodations for Disabilities

Section 504 of the Rehabilitation Act of 1973, Title II of the Americans with Disabilities Act of 1990, and the ADA Amendment Act of 2008 provides protection from illegal discrimination for qualified individuals with disabilities. Students requesting academic accommodations due to disabilities must arrange for such accommodations by contacting Kelly Beck, Pathways Academic Success Associate. She can be reached at the Pathways Office, (319) 352-8230 or by e-mail kelly.beck@wartburg.edu. Accommodations should be requested PRIOR to affected assignment due dates.

Source: Kelly Beck, May 27, 2015

Sexual Misconduct and Discrimination:

Wartburg College is committed to providing a learning, working, and living environment free from all forms of sexual misconduct including, but not limited to, sex-based harassment, non-consensual sex acts, sexual exploitation, relationship violence, and stalking. Wartburg College considers sex discrimination in all forms to be a serious offense and it will not be tolerated.

The Wartburg College's Title IX, Sexual Misconduct and Discrimination Policy, following national guidance from the Office of Civil Rights, requires that faculty follow Wartburg's policy as a "mandatory reporter" of any personal disclosure of sexual harassment, sexual misconduct, and/or violence related experiences or incidents shared with the faculty member in person, via email, and/or in classroom settings. These disclosures include but are not limited to reports of personal relationship abuse, relational/domestic violence, and stalking. While faculty are often able to help students locate appropriate channels of assistance on campus, disclosure by the student to the faculty member requires that the faculty member inform appropriate Wartburg personnel to help ensure that the student's safety and welfare is being addressed, even if the student requests that the disclosure not be shared.

For confidential counseling support and assistance on campus, please contact:
Wartburg College Counseling Services, 319-352-8596
Wartburg College Campus Pastors, 319-352-8217

For private, but not confidential, resources on campus, please contact:
John Myers, Director of Campus Security, 319-352-8372
Jamie Hollaway, Title IX Coordinator, 319-352-8418
Cassie Hales, Director of Residential Life, 319-352-8260
Dr. Dan Kittle, Dean of Students, 319-352-8745
Campus Security officers and residence hall directors

TOPIC AND READING ASSIGNMENTS (tentative)

# ASSIGNMENT	DATE	TOPIC	READING
1.	Jan. 9	Introduction to Biotechnology	Chapter 1
2.	Jan. 11	The Biotechnology Century	Chapter 1
3.	Jan. 13	Introduction to Genes and Genomes	Chapter 2
4.	Jan. 16	Introduction to Genes and Genomes	Chapter 2
5.	Jan. 18	Recombinant DNA Technology and Genomics	Chapter 3
6.	Jan. 20	Recombinant DNA Technology and Genomics	Chapter 3
7.	Jan. 23	Discussion and Review	
8.	Jan. 25	Exam I	
9.	Jan. 27	Proteins as Products	Chapter 4
10.	Jan. 30	Proteins as Products	Chapter 4
11.	Feb. 1	Microbial Biotechnology	Chapter 5
12.	Feb. 3	Microbial Biotechnology	Chapter 5
13.	Feb. 6	Plant Biotechnology	Chapter 6
14.	Feb. 8	Plant Biotechnology	Chapter 6
15.	Feb. 10	Presentations	
16.	Feb. 13	Review	
17.	Feb. 15	Exam II	
18.	Feb. 17	Animal Biotechnology	Chapter 7
19.	Feb. 20	Animal Biotechnology	Chapter 7
20.	Feb. 22	DNA Fingerprinting and Forensic Analysis	Chapter 8
21.	Feb. 24	DNA Fingerprinting and Forensic Analysis	Chapter 8
WINTER BREAK FEB. 24TH (5:35PM) TO MARCH 5TH			
22.	March 6	Bioremediation	Chapter 9
23.	March 8	Bioremediation	Chapter 9
24.	March 10	Aquatic Biotechnology	Chapter 10
25.	March 13	Aquatic Biotechnology	Chapter 10
26.	March 15	Discussion & Review	
27.	March 17	Exam III	
28.	March 20	Film (TBA ethical topic)	
29.	March 22	Medical Biotechnology	Chapter 11
30.	March 24	Medical Biotechnology	Chapter 11
31.	March 27	Medical Biotechnology	Chapter 11
32.	March 29	Presentations	
33.	March 31	Biotechnology Regulations	Chapter 12
34.	April 3	Ethics and Biotechnology	Chapter 13
35.	April 5	Ethics and Biotechnology	Chapter 13
36.	April 7	Ethics and Biotechnology	Chapter 13
37.	April 10	Presentations	
38.	April 12	Discussion and Review for Final	
EASTER BREAK APRIL 13TH (5:30PM) –APRIL 17TH			
FINAL TBA			

PARTICIPATION

The student/mentor relationship hoped to be obtained and maintained will require the students' attendance, preparation, and participation. The instructor (mentor) will be expecting it. The student will be graded on their participation in discussion group and in the laboratory. Furthermore, preparation for lecture, exams, assignments, and some experiments will require a minimum of two hours of outside time in addition to those blocked off by the course.

GRADE BREAKDOWN

EVALUATION	~% OF GRADE	POINTS
3 EXAMS	38	225
3 QUIZES	13	75
COMPARISON PAPER	8	50
PRESENTATION	8	50
REVIEW PAPER	17	100
PARTICIPATION	4	25
FINAL EXAM	13	75
TOTALS	~100	600

NOTE: ALL DEADLINES ARE ABSOLUTE AND WORK WILL NOT BE ACCEPTED AFTER THAT DATE AND TIME.

% OF POINTS	GRADE
93-100	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-
<60	F

GRADE RECORD

EVALUATION	POINTS POSSIBLE	POINTS EARNED	PERCENT
EXAM 1	75		
EXAM 2	75		
EXAM 3	75		
QUIZ 1	25		
QUIZ 2	25		
QUIZ 3	25		
TOTAL	300		
COMPARISON PAPER	50		
REVIEW PAPER	100		
PRESENTATION	50		
PARTICIPATION	25		
TOTAL	525		
FINAL EXAM	75		
TOTAL POINTS	600		

IMPORTANT DUE DATES

TBA

LABORTORY- The lab manual is not written. However, I plan to have the student do DNA fingerprinting, parental testing, searching for a cancer causing gene, PCR, and have the students create recombinant DNA and have them express a foreign gene in a bacterium.