## 1. General Information

1a. Submitted by the College of: ARTS &SCIENCES

Date Submitted: 2/10/2016

1b. Department/Division: Biology

1c. Contact Person

Name: Ruth E Beattie

Email: rebeat1@uky.edu

Phone: 257-7647

Responsible Faculty ID (if different from Contact)

Name:

Email:

Phone:

1d. Requested Effective Date: Semester following approval

1e. Should this course be a UK Core Course? No

## 2. Designation and Description of Proposed Course

2a. Will this course also be offered through Distance Learning?: No

2b. Prefix and Number: BIO 527

2c. Full Title: Stem cells, tissue engineering, and regenerative medicine

2d. Transcript Title: Stem cells, tissue engineering, and regenerative medicine

2e. Cross-listing:

2f. Meeting Patterns

LECTURE: 3

2g. Grading System: Letter (A, B, C, etc.)

2h. Number of credit hours: 3

2i. Is this course repeatable for additional credit? No

If Yes: Maximum number of credit hours:

If Yes: Will this course allow multiple registrations during the same semester?

2j. Course Description for Bulletin: The course will provide students with knowledge from a broad range of topics related to stem cells, tissue engineering and regenerative medicine, including: an historical perspective of these fields, contemporary use of stem cells in medicine, introduction to different concepts in regenerative medicine, research in tissue engineering and biomaterials, and societal issues surrounding stem cells and regenerative medicine.

2k. Prerequisites, if any: BIO 315 and BIO 304

2l. Supplementary Teaching Component:

3. Will this course taught off campus? No

If YES, enter the off campus address:

4. Frequency of Course Offering: Spring,

Will the course be offered every year?: No

If No, explain: course will be offered every two years

5. Are facilities and personnel necessary for the proposed new course available?: Yes

If No, explain:

6. What enrollment (per section per semester) may reasonably be expected?: 25 - 30

7. Anticipated Student Demand

Will this course serve students primarily within the degree program?: Yes

Will it be of interest to a significant number of students outside the degree pgm?: No

If Yes, explain:

8. Check the category most applicable to this course: Not Yet Found in Many (or Any) Other Universities ,

If No, explain:

9. Course Relationship to Program(s).

a. Is this course part of a proposed new program?: No

If YES, name the proposed new program:

b. Will this course be a new requirement for ANY program?: No

If YES, list affected programs:

10. Information to be Placed on Syllabus.

a. Is the course 400G or 500?: Yes

b. The syllabus, including course description, student learning outcomes, and grading policies (and 400G-/500-level grading differentiation if applicable, from **10.a** above) are attached: Yes

## Distance Learning Form

Instructor Name:

Instructor Email:

Internet/Web-based: No

Interactive Video: No

Hybrid: No

1.How does this course provide for timely and appropriate interaction between students and faculty and among students? Does the course syllabus conform to University Senate Syllabus Guidelines, specifically the Distance Learning Considerations?

2.How do you ensure that the experience for a DL student is comparable to that of a classroom-based student's experience? Aspects to explore: textbooks, course goals, assessment of student learning outcomes, etc.

3.How is the integrity of student work ensured? Please speak to aspects such as password-protected course portals, proctors for exams at interactive video sites; academic offense policy; etc.

4.Will offering this course via DL result in at least 25% or at least 50% (based on total credit hours required for completion) of a degree program being offered via any form of DL, as defined above?

If yes, which percentage, and which program(s)?

5.How are students taking the course via DL assured of equivalent access to student services, similar to that of a student taking the class in a traditional classroom setting?

6.How do course requirements ensure that students make appropriate use of learning resources?

7.Please explain specifically how access is provided to laboratories, facilities, and equipment appropriate to the course or program.

8.How are students informed of procedures for resolving technical complaints? Does the syllabus list the entities available to offer technical help with the delivery and/or receipt of the course, such as the Information Technology Customer Service Center (http://www.uky.edu/UKIT/)?

9.Will the course be delivered via services available through the Distance Learning Program (DLP) and the Academic Technology Group (ATL)? NO

If no, explain how student enrolled in DL courses are able to use the technology employed, as well as how students will be provided with assistance in using said technology.

10.Does the syllabus contain all the required components? NO

11.I, the instructor of record, have read and understood all of the university-level statements regarding DL.

Instructor Name:

SIGNATURE|VCASS2|Vincent Cassone|BIO 527 NEW Dept Review|20150613

SIGNATURE|ACSI222|Anna C Harmon|BIO 527 NEW College Review|20151005

SIGNATURE|JMETT2|Joanie Ett-Mims|BIO 527 NEW Undergrad Council Review|20151216

SIGNATURE|JEL224|Janie S Ellis|BIO 527 NEW Senate Council Review|20160210

SIGNATURE|VCASS2|Vincent Cassone|BIO 527 NEW Approval Returned to Dept|20160210

SIGNATURE|ZNNIKO0|Roshan N Nikou|BIO 527 NEW Graduate Council Review|20160210

# New Course Form

https://myuk.uky.edu/sap/bc/soap/rfc?services=

Generate R

Open in full window to print or save

**Attachments:**

Browse... Upload File

| | ID | Attachment |
|---|---|---|
| Delete | 5128 | BIO 527 syllabus.docx |
| Delete | 5528 | BIO 527 UGC Review Checklist.docx |
| Delete | 5939 | Revised BIO 527 syllabus.docx |

First 1 Last

(*denotes required fields)

**1. General Information**

a. * Submitted by the College of: ARTS & SCIENCES Submission Date: 2/10/2016

b. * Department/Division: Biology

c.

* Contact Person Name: Ruth E Beattie Email: rebeat1@uky.edu Phone: 257-7647

* Responsible Faculty ID (if different from Contact) Email: Phone:

d. * Requested Effective Date: ◉ Semester following approval OR ○ Specific Term/Year [1]

e.

Should this course be a UK Core Course? ○ Yes ◉ No

**If YES, check the areas that apply:**

| | |
|---|---|
| ☐ Inquiry - Arts & Creativity | ☐ Composition & Communications - II |
| ☐ Inquiry - Humanities | ☐ Quantitative Foundations |
| ☐ Inquiry - Nat/Math/Phys Sci | ☐ Statistical Inferential Reasoning |
| ☐ Inquiry - Social Sciences | ☐ U.S. Citizenship, Community, Diversity |
| ☐ Composition & Communications - I | ☐ Global Dynamics |

**2. Designation and Description of Proposed Course.**

a. * Will this course also be offered through Distance Learning? ○ Yes [4] ◉ No

b. * Prefix and Number: BIO 527

c. * Full Title: Stem cells, tissue engineering, and regenerative medicine

d. Transcript Title (if full title is more than 40 characters): Stem cells, tissue engineering, and regenerative m

e. To be Cross-Listed [2] with (Prefix and Number):

f. * Courses must be described by at least one of the meeting patterns below. Include number of actual contact hours [3] for each meeting pattern type.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 3 | Lecture | | Laboratory [1] | | Recitation | | Discussion |
| | Indep. Study | | Clinical | | Colloquium | | Practicum |
| | Research | | Residency | | Seminar | | Studio |
| | Other | If Other, Please explain: | | | | | |

g. * Identify a grading system:

◉ Letter (A, B, C, etc.)
○ Pass/Fail
○ Medicine Numeric Grade (Non-medical students will receive a letter grade)
○ Graduate School Grade Scale

h. * Number of credits: 3

i. * Is this course repeatable for additional credit? ○ Yes ◉ No

If YES: Maximum number of credit hours:

If YES: Will this course allow multiple registrations during the same semester? ○ Yes ○ No

j. * Course Description for Bulletin:

The course will provide students with knowledge from a broad range of topics related to stem cells, tissue engineering and regenerative medicine, including: an historical perspective of these fields, contemporary use of stem cells in medicine, introduction to different concepts in regenerative medicine, research in tissue engineering and biomaterials, and societal issues surrounding stem cells and regenerative medicine.

k. Prerequisites, if any:

BIO 315 and BIO 304

l. Supplementary teaching component, if any: ○ Community-Based Experience ○ Service Learning ○ Both

3. *** Will this course be taught off campus?** ○ Yes ◉ No

If YES, enter the off campus address:

4. **Frequency of Course Offering.**

a. * Course will be offered (check all that apply): ☐ Fall ☑ Spring ☐ Summer ☐ Winter

b. * Will the course be offered every year? ○ Yes ◉ No

If No, explain: course will be offered every two years

5. *** Are facilities and personnel necessary for the proposed new course available?** ◉ Yes ○ No

If No, explain:

6. *** What enrollment (per section per semester) may reasonably be expected?** 25 - 30

7. **Anticipated Student Demand.**

a. * Will this course serve students primarily within the degree program? ◉ Yes ○ No

b. * Will it be of interest to a significant number of students outside the degree pgm? ○ Yes ◉ No

If YES, explain:

8. *** Check the category most applicable to this course:**

☐ Traditional – Offered in Corresponding Departments at Universities Elsewhere
☐ Relatively New – Now Being Widely Established
☑ Not Yet Found in Many (or Any) Other Universities

9. **Course Relationship to Program(s).**

a. * Is this course part of a proposed new program? ○ Yes ◉ No

If YES, name the proposed new program:

b. * Will this course be a new requirement [5] for ANY program? ○ Yes ◉ No

If YES [5], list affected programs::

10. **Information to be Placed on Syllabus.**

a. * Is the course 400G or 500? ◉ Yes ○ No
If YES, the *differentiation for undergraduate and graduate students must be included* in the information required in **10.b**. You must include: (i) ident additional assignments by the graduate students; and/or (ii) establishment of different grading criteria in the course for graduate students. (See SR

b. ☑ * The syllabus, including course description, student learning outcomes, and grading policies (and 400G-/500-level grading differentiation if appl **10.a** above) are attached.

[11] Courses are typically made effective for the semester following approval. No course will be made effective until all approvals are received.
[12] The chair of the cross-listing department must sign off on the Signature Routing Log.

[13] In general, undergraduate courses are developed on the principle that one semester hour of credit represents one hour of classroom meeting per week for a semester, exclusive of any laboratory meeting. Laboratory meeting, generally, re two hours per week for a semester for one credit hour. (from SR 5.2.1)
[19] You must also submit the Distance Learning Form in order for the proposed course to be considered for DL delivery.
[21] In order to change a program, a program change form must also be submitted.

Rev 8/09

**Course: BIO 527** **University Senate Syllabi Guidelines Review Checklist**

**General Course Information**

- ☒ Full and accurate title of the course
- ☒ Departmental and college prefix
- ☒ Course prefix, number and section number
- ☐ Scheduled meeting day(s), time and place

**Instructor Contact Information** (if specific details are unknown, "TBA" is acceptable for one or more fields)

- ☒ Instructor name
- ☐ Contact information for teaching/graduate assistant, etc.
- ☒ Preferred method for reaching instructor
- ☒ Office phone number
- ☒ Office address
- ☒ UK email address
- ☒ Times of regularly scheduled office hours and if prior appointment is required

**Course Description**

- ☒ Reasonably detailed overview of the course
- ☒ Student learning outcomes
- ☐ Course goals/objectives
- ☒ Required materials (textbook, lab materials, etc.)
- ☐ Outline of the content, which must conform to the Bulletin description
- ☒ Summary description of the components that contribute to the determination of course grade
- ☒ Tentative course schedule that clarifies topics, specifies assignment due dates, examination date(s)
- ☐ Final examination information: date, time, duration and location
- ☒ For 100-, 200-, 300-, 400-, 400G- and 500-level courses, numerical grading scale and relationship to letter grades for undergraduate students
- ☒ For 400G-, 500-, 600- and 700-level courses, numerical grading scale and relationship to letter grades for graduate students. (Graduate students cannot receive a "D" grade.)
- ☒ Relative value given to each activity in the calculation of course grades (Midterm=30%; Term Project=20%, etc.)
- ☒ Note that undergraduate students will be provided with a Midterm Evaluation (by the midterm date) of course performance based on criteria in syllabus
- ☐ Policy on academic accommodations due to disability. Standard language is below:

  If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. In order to receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center (DRC). The DRC coordinates campus disability services available to students with disabilities. It is located on the corner of Rose Street and Huguelet Drive in the Multidisciplinary Science Building, Suite 407. You can reach them via phone at (859) 257-2754 and via email at drc@uky.edu. Their web address is http://www.uky.edu/StudentAffairs/DisabilityResourceCenter/.

**Course Policies**

- ☒ Attendance
- ☐ Excused absences
- ☒ Make-up opportunities
- ☐ Verification of absences
- ☐ Submission of assignments
- ☒ Academic integrity, cheating & plagiarism
- ☒ Classroom behavior, decorum and civility
- ☐ Professional preparations
- ☐ Group work & student collaboration

**UGE Review** (Date)

Include scheduled meeting days and times ("TBA" is okay)

Include updated policy for Excused Absences

Include boilerplate language for Disability policy

**Committee Review** (Date)

Comments

**College of Arts and Sciences**
**Department of Biology**
**Spring XXX**

# BIO 527: Stem cells, tissue engineering, and regenerative medicine


**Instructor Contact Information**
Dr. Edmund Rucker
Office: Rm. 313 T.H. Morgan Building
Phone: 257-2175
e-mail: edmund.rucker@uky.edu (preferred contact method)
Office Hours: 12:00-2:00 T-R or by appointment

Dr. Ashley W. Seifert
Office: Rm. 211 T.H. Morgan Building
Phone: 218-2668
e-mail: awseifert@uky.edu
Office Hours: 12:00-2:00 M, F or by appointment


## Course Description

The course will provide students with knowledge from a broad range of topics related to stem cells, tissue engineering and regenerative medicine, including: an historical perspective of these fields, contemporary use of stem cells in medicine, introduction to different concepts in regenerative medicine, research in tissue engineering and biomaterials, and societal issues surrounding stem cells and regenerative medicine.

Student learning outcomes: by the end of this course students will be able to:

1) Define different types of stem cells, their characteristics and how they are derived;
2) Differentiate between tissue-specific stem cell types and how they are regulated;
3) Describe the clinical uses of stem cells in trial studies;
4) Demonstrate an understanding of the advances and limitations in the field of tissue engineering;
5) Distinguish the utility of different types of animal models in regeneration research;
6) Assess the ethical and political issues related to stem cell research.

**Pre-requisites: BIO 315 (Cell Biology) and BIO 304 (Genetics).**

## Teaching Methods

The course is designed as a discussion and primary literature survey. Students will be assigned into 5 groups, and these groups will present 2 papers to the class during the semester. The papers can be discussed informally, but the students may wish to show figures in a Powerpoint presentation (optional). Selection of the papers for presentation will done approximately 1 week prior to discussion as shown on schedule below. These same groups also form "Biotech companies," and each company will give a final Powerpoint presentation on how they would utilize stem cells or biomaterials in treatment of a particular human disease.

**College of Arts and Sciences**
**Department of Biology**
**Spring XXX**

## Required Texts or Readings

1) StemBook. Open-access collection of original, peer-reviewed chapters covering topics related to stem cell biology (http://www.stembook.org).

2) NIH Stem Cell Information Home Page (http://stemcells.nih.gov/index).

## Grading Criteria

There will be one mid-term 'take home' exam, two paper presentations, written summaries on non-presented papers, and a 'final' Biotech company presentation.

Make-up of any missed assignment or examination will only be given for **DOCUMENTED** excused absences **as defined by the University (Senate Rule V.2.4.2)** A missed exam/assignment will result in a score of zero for that exam/assignment, unless an acceptable written excuse is presented within one week of the missed exam/assignment.

Students should contact Dr. Rucker to arrange for a make-up of any assignments/exams missed due to an excused absence as defined by the university.

While attendance does not directly contribute to your final grade, this is a very interactive and discussion-based course so attendance at all class meetings is expected. Failure to attend class will severely compromise your ability to successfully complete the required assignments/exams.

Undergraduates will be provided with a mid-term evaluation of course performance based on criteria in syllabus.

Grading rubrics for the scoring of the presentations, written summaries, and Biotech Company assignment will be given out in class.

Undergraduates

| | |
|---|---|
| Mid-term exam: | 100 pts |
| Paper presentations (2): | 100 pts |
| Biotech company: | 100 pts |
| Written summaries (4): | 100 pts |

Graduates

| | |
|---|---|
| Mid-term exam: | 100 pts |
| Paper presentations (2): | 100 pts |
| Biotech company: | 100 pts |
| Written summaries (6): | 100 pts |

*(Graduate students complete two additional written summaries)*

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Grades are determined as follows:

| Undergraduates | Graduates |
|---|---|
| A: 90-100%; (360-400 pts) | A: 92-100%; (368-400 pts) |
| B: 80-89%; (320-359 pts) | B: 82-91.9%; (328-367 pts) |
| C: 70-79%; (280-319 pts) | C: 70 - 81.9%; (280 - 327 pts) |
| D: 60-69%; (240-279 pts) | E: less than 70% (less than 280 points) |
| E: 59% and below. (239 pts and below) | |

**Lecture and Exam Schedule** (*based on SP 2013 dates*)

| Class # | Topic |
|---|---|
| Jan 9 | Course Overview |
| Jan 11 | Paper: "Introduction to Stem Cells and Regenerative Medicine" |
| Jan 14 | Paper: "Induced pluripotent stem cells: the new patient?" |
| Jan 16 | Paper: "Organ Engineering I" |
| Jan 18 | Paper: Organ Engineering II" |
| Jan 21 | **MLK- No class** |
| Jan 23 | HHMI Video Lecture #1: "Understanding Embryonic Stem Cells" |
| Jan 25 | HHMI Video Lecture #2: "Adult Stem Cells and Regeneration" |
| Jan 28 | HHMI Video Lecture #3: "Coaxing Embryonic Stem Cells" |
| Jan 30 | HHMI Video Lecture #4: "Stem Cells and the End of Aging" |
| Feb 1 | Discussion of Videos and Concepts |
| Feb 4 | NIH Regenerative Medicine: Chapters 1-2. |
| Feb 6 | NIH Regenerative Medicine: Chapters 3-4. |
| Feb 8 | Review Ch 1-4; Review Paper #1 |
| Feb 11 | NIH Regenerative Medicine: Chapters 5-6. |
| Feb 13 | NIH Regenerative Medicine: Chapters 7-8.Review papers II |
| Feb 15 | Review Ch 5-8; Review Paper #2 |
| Feb 18 | NIH Regenerative Medicine: Chapters 9-10. (**Round #1 papers due**) |
| Feb 20 | NIH Regenerative Medicine: Chapters 10-11 |
| Feb 22 | Review Ch 9-11; Review Paper #3 |
| Feb 25 | **Group #1 paper; Group #2 paper** |
| Feb 27 | **Group #3 paper; Group #4 paper** |
| Mar 1 | **Group #5 paper**; discussion and summary of papers; **Mid-term handed out** |
| Mar 4 | IPS cells and Reprogramming; |
| Mar 6 | Gene therapy |
| Mar 8 | Cloning; **Mid-term due** |

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| | |
|---|---|
| Mar 11-15 | Spring Break |
| Mar 18 | Primary germ layer development |
| Mar 20 | Mesenchymal stems cells (MSCs) |
| Mar 22 | Progenitor cell plasticity |
| Mar 25 | Case study: Therapeutic use of MSCs |
| Mar 27 | Extracellular matrix biology: Development |
| Mar 29 | Extracellular matrix biology: Regeneration |
| Apr 1 | Synthetic and Biological Scaffolds (**Round #2 papers due**) |
| Apr 3 | Case study: Biological matrices for skin and bone regeneration |
| Apr 5 | Scaffolds, bioreactors and *in vitro* organ production |
| Apr 8 | **Group #5 paper; Group #4 paper** |
| Apr 10 | **Group #3 paper; Group #2 paper** |
| Apr 12 | **Group #1 paper**; discussion and summary of papers. |
| Apr 8 | Current advances in wound healing and skin regeneration |
| Apr 10 | Animal Models of Regeneration I |
| Apr 12 | Animal Models of Regeneration II |
| Apr 15 | Problems and scientific challenges of regenerative medicine |
| Apr 17 | Discussion: Politics and ethics of regenerative medicine |
| Apr 19 | **Open- no class – time to prepare for presentations** |
| Apr 22 | Group presentations I |
| Apr 24 | Group presentations II |
| Apr 26 | Group presentations III |

## Policies

### ADA Accommodation

Anyone with a disability that will require accommodations under the terms of federal regulations must present a written accommodation request to the instructor by the second class meeting. You may also contact the Office of Equal Opportunity, Heather Conger, 257-8927, hyork2@email.uky.edu, in the Office of Institutional Equity and Equal Opportunity. Go to http://www.uky.edu/eForms/alphaindex.php for the ADA reasonable accommodation request form.

### Academic Misconduct

Cheating and disciplinary action for cheating is defined by the student policy manual. Plagiarism and cheating refer to the use of unauthorized books, notes, or otherwise securing help in a test; copying tests, assignments, reports, or term papers;

representing the work of another a one's own; collaborating, without authority, and with another student during an examination or in preparing academic work; or otherwise practicing scholastic dishonesty.

Academic dishonesty matters may first be considered by the faculty member who may assign penalties such as failing, reduction or changing of a grade in a test, course, assignment, or other academic work, denial of a degree and/or performing additional academic work not required of other students in the course. If the student does not accept the decision of the faculty member, he/she may have his;/her case heard by the academic department chairperson or head for review of his/her case. If the student does not accept the decision of the academic department chairperson, he/she may then follow the normal appeal procedures listed in Disciplinary Procedures.

Descriptions of other academic misconduct can be found at Section 6.3, Part II of the U.K. Student Rights and Responsibilities, (http://www.uky.edu/StudentAffairs/Code/) and you are expected to have read and understood that document. Cases of suspected offenses will be handled according to the procedures described in Section 6.4, Part II of the U.K. Student Rights and Responsibilities.

**Course Policy on Classroom Civility and Decorum:**

The university, college and department all have a commitment to respect the dignity of all and to value differences among members of our academic community. There exists the role of discussion and debate in academic discovery and the right of all to respectfully disagree from time-to-time. Students clearly have the right to take reasoned exception and to voice opinions contrary to those offered by the instructor and/or other students (S.R. 6.1.2). Equally, a faculty member has the right -- and the responsibility -- to ensure that all academic discourse occurs in a context characterized by respect and civility. Obviously, the accepted level of civility would not include attacks of a personal nature or statements denigrating another on the basis of race, sex, religion, sexual orientation, age, national/regional origin or other such irrelevant factors.