

# Course Change Request

## New Course Proposal

Date Submitted: 12/05/19 3:45 pm

Viewing: **BIOL 491 : Selected Topics in Biology**

## Laboratory Techniques

Last edit: 12/05/19 3:45 pm

Changes proposed by: dpolayes

### In Workflow

1. **BIOL Undergraduate Representative**
2. **SC Curriculum Committee**
3. SC Associate Dean
4. Assoc Provost- Undergraduate
5. Registrar-Courses
6. Banner

### Approval Path

1. 12/06/19 12:05 pm  
Geraldine Grant (ggrant1): Approved for BIOL Undergraduate Representative

Are you completing this form on someone else's behalf?

No

Effective Term: Fall 2020

Subject Code: BIOL - Biology

Course Number:  
491

Bundled Courses:

Is this course replacing another course? No

Equivalent Courses:

Catalog Title: Selected Topics in Biology Laboratory Techniques

Banner Title: Select Lab techniques

Will section titles vary by semester? Yes

Credits: 1-2

Schedule Type: Laboratory

Hours of Lab or Studio per week: 3

Repeatable: May be repeated within degree (RD)

Max Allowable Credits: 4

Default Grade Mode: Undergraduate Regular

Recommended Prerequisite(s):

Recommended Corequisite(s):

**Required****Prerequisite(s) /****Corequisite(s)****(Updates only):**

(BIOL 213 or BIOL U213) and (BIOL 311 or BIOL L311) and (BIOL305 or BIOL L305 or BIOL246) and (BIOL 306 or BIOL L306) and CHEM 211/213 and CHEM212/214

**Registrar's Office Use Only - Required Prerequisite(s)/Corequisite(s):**

| And/Or | ( | Course/Test Code | Min Grade/Score | Academic Level | ) | Concurrency? |
|--------|---|------------------|-----------------|----------------|---|--------------|
|        |   |                  |                 |                |   |              |

**Registration****Restrictions****(Updates only):****Registrar's Office Use Only - Registration Restrictions:****Field(s) of Study:****Class(es):****Level(s):****Degree(s):****School(s):****Catalog****Description:**

Experimental studies using current methods in biology. Provides training for research in various aspects of biology. Topics will depend on the professor teaching the class. The course can only be repeated twice if the topic is different for no more than 4 credits

**Justification:**

Students need research experience and having professors only take one student at a time will limit how many students can get research opportunities. There are many faculty who have projects that could have 6-8 students working on them independently so that the faculty member gets new data and the students learn modern procedures.

**Does this course cover material which crosses into another department?** No

**Learning Outcomes:**

Each research topic will have its own specific goals but generally

- To become familiar with the technique
- To prepare material for the procedure
- To perform analysis on the resulting data

**Attach Syllabus**

[BIOL 417 Fall 2019.pdf](#)

**Additional Attachments**

**Staffing:**

Any of the faculty in the biology department can propose a BIOL491 topic for a semester

**Relationship to Existing Programs:**

Will complement our research semester

**Relationship to Existing Courses:**

None

**Additional Comments:**

**Reviewer Comments**

**This is an example of a course we would like to teach under the title BIOL491.**

**BIOL 417-Illumina Sequencing**  
**Schedule of Laboratory Exercises**  
**Exploratory Hall 502**  
**Fall 2019**

**Instructor: Dr. Anne Scherer, Peggy Einhorn**  
**Office: EXPL 1200**  
**Email: peinhorn@gmu.edu**  
**Email: aschere2@gmu.edu**

| Date              | Exercises   | Reading Assignment            |
|-------------------|---|-------------------------------|
| Monday<br>8/26    | Course/Syllabus Review<br>General Sequencing Overview<br>Next Generation Sequencing<br>16S overview   | <b>Video and Slide Review</b> |
| Wednesday<br>8/28 | 16s Project Review- Guest Speaker:<br>Dr. Jen Salerno<br>Review 16s Workflow Detail   | <b>Week 1 Resources</b>       |
| 8/29 R            | Set up first PCR Reaction with<br>Microplastics samples   |                               |
| 8/30              | Set up first PCR Reaction with<br>Microplastics samples   |                               |
| 9/2               | No labs- Labor Day Holiday  |                               |
| 9/3               | Set up first PCR Reaction with<br>Microplastics samples   |                               |
| Wednesday<br>9/4  | Clean up first PCR reaction and do<br>second PCR Reaction<br>QC with Qubit<br>Normalize and Pool samples<br><br>Set up Basespace accounts                                 |                               |
| 9/5 R             | Bioanalyzer   |                               |
| Monday<br>9/9     | Bioanalyzer at Science and Tech<br><br>BaseSpace Analysis Overview<br>16s analysis overview<br><br>Start the sequencing run 16s   | <b>Week 2 Resources</b>       |
| 9/10 T            | Start the sequencing run  |                               |
| Wednesday<br>9/11 | Whole Genome Sequencing<br>Review transposons and Nextera<br>Library Prep of phage (5-6 samples)<br><br>Guest Speaker: Dr. Anner Scherer<br>Introduction to phage project |                               |

|                   |  |                         |
|-------------------|--|-------------------------|
| 9/12 R            | Library clean-up   |                         |
| 9/13 F            | Library clean up   |                         |
| Monday<br>9/16    | Library clean-up and prepare samples for sequencing  | <b>Week 3 Resources</b> |
| 9/17 T            | Bioanalyzer  |                         |
| Wednesday<br>9/18 | Whole Genome Sequencing<br>Nextera Library Prep of Bacterial Isolates- Honey Bee<br><br>Guest Speaker Dr. Jen Salerno:<br>Introduction to Honey Bee Effort |                         |
| 9/19 R            | Library clean up   |                         |
| 9/20 F            | Library clean up   |                         |
| Monday<br>9/23    | Library clean-up and pool libraries prepare samples for sequencing   | <b>Week 4 resources</b> |
| 9/24 T            |  |                         |
| Wednesday<br>9/25 | Sequence all phage and Bacterial Isolates together single run  |                         |
| 9/26 R            |  |                         |
| 9/27 F            |  |                         |
| Monday<br>9/30    | Base Space Analysis  | <b>Week 5 Resources</b> |
| 10/1 T            |  |                         |
| Wednesday<br>10/2 | Illumina Guest Speaker-Mehdi to present<br>Base Space Analysis   |                         |
| 10/3 R            |  |                         |
| 10/4 F            |  |                         |
| Monday<br>10/7    | Presentations, Analysis and lessons learned  |                         |
| 10/8 T            |  |                         |
| Wednesday<br>10/9 | Illumina Guest Speaker<br>Overview of Technology Market and Job Opportunities<br>Illumina IAspire- future Job Market Opportunities                         |                         |
| 10/14-10/18       | End of labs- Fall Break  |                         |

\*Lab exercises are subject to change at the instructor's discretion.

**Attendance:** Attendance and participation are crucial to achieving the goals of the course

I. COURSE GOALS:

- To become familiar with Next Generation Sequencing Technologies and specifically the Illumina Platform
- To construct both whole genome and 16s Libraries in preparation for sequencing
- To perform analysis on the resulting sequences using Illumina Basespace software packages

II. GRADING POLICY: Course grades will be determined by the following

50% Final Project Presentation and Poster  
25% Notebook  
20% Homework Submissions  
5% Attendance and Participation

GRADING SCALE: 90-100% = A, 80-89% = B, 70-79% = C, 60-69% = D, < 60% = F

**NOTE:** At the instructor's discretion, the +/- grading system may be applied to the above grading scale.

III. NOTEBOOK REVIEW: Notebooks will be checked weekly for completeness and scored according to a Blackboard posted grading rubric.

IV. HOMEWORK: Students will be required to turn in questions that accompany each experiment at the beginning of class. **No late work will be accepted.**

V. Honor Code: Each student must do his/her homework individually. Although we gather data in groups, each student must do the data analysis and written responses independently. Violation of this rule will be considered a violation of the GMU honor code. This applies to both the laboratory notebooks and the homework. Cheating will not be tolerated and it is your duty as a GMU student to report any violations of the Honor Code to your instructor.