PRAIRIE VIEW A&M UNIVERSITY

SYLLABUS

BIOL 3134 SYNTHETIC BIOLOGY
Fall August 26, 2019 - December 14, 2019

Instructor: Dr. D. Vaden, Ph.D.
Section # and CRN: P01, 13141 and P81, 13143
Office Location: E.E. O'Banion Science Building, Biology Department, Suite 430AB
Office Phone: (936) 261-3172
Email Address: Use MY MAIL (eCourses email)
Office Hours: Tuesday & Thursday, 3-5PM or by appointment
Mode of Instruction: Face to Face

Course Location: E.E. O'Banion Science Building
Class Days & Times: Lecture - TR, 9:30AM - 10:50PM, Rm. A103 Lab - TR, 12 – 1:50PM, Rm 407
Catalog Description: BIOL 3134 Credit (2-4) credit 4 semester hours. The interdisciplinary study of synthetic biology applied to design and construct new biological parts, devices and systems. Laboratory fee required.

Prerequisites: BIOL 1015, 1025, 2054, 3073
Co-requisites: NA

Required Texts: Literature, research papers and reviews that cover diverse areas within synthetic biology will be provided to each student

Other Required Course Materials: Labster Virtual Simulations (subscription provided). Students are required to a 100-Sheet Classic Black & White Composition Notebook, and a binder (1 inch) with 2 inside pockets to assemble all documents/literature received in class by Sept. 10. Students are required to bring the binder to each lecture and laboratory class.

Student Learning Outcomes:
Program Learning Outcome # Alignment: knowledge of #1) the chemical basis of life, #2) the central concepts of Genetics; #3) Cell Biology; #4) Organismal Biology; and #5) scientific communication

Core Curriculum Outcome Alignment: Critical Thinking, Communication, Empirical and Quantitative Skills, and Teamwork

	Upon successful completion of this course, students will be able to:	Program Learning Outcome # Alignment	Core Curriculum Outcome Alignment
1	Understand basic terms, concepts, and methods of Synthetic Biology.	#1-4	Critical Thinking
2	Demonstrate a greater appreciation for interdisciplinary sciences.	#1-4	Critical Thinking
3	Increase motivation and involvement in the process of scientific discovery.	#1-4	Critical Thinking, Empirical and Quantitative Skills
4	Acquire hands-on laboratory experience using current research technology	#1-4	Critical Thinking, Empirical and Quantitative Skills
5	Develop analytical skills using a wide assortment of experimental methods to develop critical thinking skills	#1-4	Critical Thinking, Empirical and Quantitative Skills
6	Develop students' competency using mathematical models and genetic circuits to make testable predictions.	#1-4	Empirical and Quantitative Skills
7	demonstrate knowledge of scientific communication and ability to work in groups	#5	Teamwork and Communication
8	Develop awareness of career opportunities in Synthetic Biology.		

Major Course Requirements

Method of Determining Final Course Grade

COURSE EVALUATION METHODS:

The University's Academic Catalog grading policy is used in this course.

Course Grade Requirement	Value	Total
1) Lecture Exams, Lab Exams	35%	35
2) Class assignments: Lecture/Lab Assignments eCourses Quizzes, Lab Notebook, Virtual Laboratory Simulations	40%	40
3) Synthetic Biology Project/Presentation	20%	20
3) *Lab and Lecture Performance/Participation	5%	5
Total:	**100%**	**100**

Grading Criteria and Conversion:

A = 90-100; B = 80-89; C = 70-79; D = 60-69; F = Below 60

Detailed Description of Major Assignments:

Assignment Title or Grade Requirement	Description
Lecture & Lab Exams	The midterm and final lecture exams will be cumulative in terms of synthetic biology topics tested. Some of the content of the other exams may cover chapters/information that had been taught from the first day of class to the class day immediately before the exam. The average of all lecture exams will constitute thirty five percent (35%) of the semester grade. The Department of Biology assessment of student learning and achievement, for accreditation, is measured by student's performance on the final exam. The performance on the final exam is very important in determining the knowledge obtained during the semester and often reflect the over-all grade for the semester. At least four lecture/lab exams will be conducted during the semester. The dates for each exam will be announced at least one week prior to the administration of the exam.
Class assignments	Class assignments will consist of eCourses quizzes/lab exercises / lecture quizzes Unannounced quizzes may be given by the instructor in order to evaluate how well students are learning the most recent synthetic biology concepts taught. At least 15 Labster virtual stimulation: Labster Demo, Lab Safety, Biosafety Chemistry Safety, Experimental Design, Introductory Lab, Pipetting: Master the technique, Solution Preparation: From salt to solution, Protein Synthesis, Gene Regulation, Molecular Cloning, USER, Plant Transcriptomics, Gene Expression Unit: Use sequencing to unveil a gene linked to obesity, Next Generation Sequencing, Polymerase Chain Reaction, Genetically Engineered Machine, and Synthetic Biology The average of all graded class assignments will count for 45% of the total grade.
Lab and lecture performance/participation	The Lab and lecture performance component (5%) is determine by complying with the Student Laboratory Contract, attendance, use of classroom response systems, preparation for lab, turning assignments in on time, participation & interaction with lab partner, and keeping work station clean.

Course Procedures or Additional Instructor Policies

1. CLASS ATTENDANCE: The University Attendance Policy requires students to be present for each scheduled class. Students with or without official excuses for missing class will be tested and evaluated the same as students who attend class. However, students attending class will have the advantage of being taught knowledgeable information which they are expected to know. Students are responsible for materials covered during their absences. Classes will start at the prescribed time and end at the prescribed time. Absences are accumulated beginning with the first day of class. The University catalog provides more detailed information.

2. MAKE-UP EXAMS: Students are strongly advised to take all exams at the scheduled time. Plan and schedule your activities so that you can be present to take all exams at the scheduled time. Students with non-valid or non-official excuses for missing an exam will earn a grade of zero (0) for the missed exam. Students may

request a make-up exam if an official excuse is provided. However, the instructor will schedule the time and place of the make-up exam which will not interrupt the teaching of the class or delay the complete coverage of the course topics. Students who are scheduled for the make-up exam and miss it will not be provided a second opportunity to take an exam for the original exam that was missed.

3. CHEATING. Students caught cheating will receive a grade of F for the course. Students are prohibited from participation in acts of academic dishonesty, including tampering with records or falsifying admissions or other information. Disciplinary action will be taken against any student who alone or with others engages in any act of academic fraud or deceit. The undergraduate catalog provides more detailed information. It is the responsibility of students and faculty members to maintain academic integrity at the University by refusing to participate in or tolerate academic dishonesty.

4. Cellular phones, I-Pods, Palm pilots, CD players, Radios, Cameras, Computers and other sorts of high technology communication instruments are not allowed to be used during any part of lectures and exams. They are instruments of cheating. They must be turned off and locked so that they cannot be seen or used. Students that are caught using these or any other instruments used to cheat, will be charged with cheating and therefore earn a failing grade of zero and F.

5. PLEASE DO NOT BRING FOOD OR DRINKS INTO THE CLASSROOM.

6. BE CERTAIN TO TURN OFF ALL CELL PHONES, IPODS AND LAPTOPS DURING CLASS.

7. Students Academic Appeals Process: Authority and responsibility for assigning grades to students rests with the faculty. However, in those instances where students believe that miscommunication, errors, or unfairness of any kind may have adversely affected the instructor's assessment of their academic performance, the student has a right to appeal by the procedure listed in the Undergraduate Catalog and by doing so within thirty days of receiving the grade or experiencing any other problematic academic event that prompted the complaint.

8. DISABILITY SERVICES: If you have a disability, please inform me so that I can assist you to get "reasonable accommodation" related to the disability. Students with disabilities who believe they may need adjustment in this class are encouraged to contact the Office of Disabilities Services at (936) 261-3585 as soon as possible. Once you receive a letter of adjustment from the office, please make an appointment with me to discuss adjustments for this class.

9. CLASSROOM CIVILITY: Each student is encouraged to help create an environment during class that promotes learning, dignity, and mutual respect for everyone. Students who speak at inappropriate times, sleep in class, display inattention, take frequent breaks, interrupt the class by coming to class late, engage in loud or distracting behaviors, use cell phone in class, use inappropriate language, are verbally abusive, display defiance or disrespect to others, or behave aggressively toward others could be asked to leave the class and subjected to disciplinary action under the Code of Student Rights, Responsibilities and Disciplinary Procedures.

Taskstream

Taskstream is a tool that Prairie View A&M University uses for assessment purposes. One of your assignments may be considered an "artifact," an item of coursework that serves as evidence that course objectives are met. More information will be provided during the semester, but for general information, you can visit Taskstream via the link in eCourses.

***TENTATIVE* LECTURE SCHEDULE AND COURSE OUTLINE:**

LECTURE TOPIC	**CONTENT**
I. Overview of synthetic biology	Synthetic biology articles: History, current applications and future directions
II. Molecular Biology	Flow of Biological Information / Central Dogma of Molecular Biology
III. Gene Regulation	Prokaryotic and eukaryotic gene regulation
IV. Molecular Biology/Genetics Technology & Techniques	Genetic engineering, PCR, Gel electrophoresis, DNA Sequencing
V. Bioinformatics	Use free access databases/resources
VI. Modeling: building a mathematic model for biological systems	Bioengineering, building a genetic circuit
VII. Constructing Vectors	BioBricks: Mining nature of new parts

***TENTATIVE* VIRTUAL SIMULATIONS AND WET LABORATORY SCHEDULE:**

LECTURE TOPIC	CONTENT
I. Lab Safety Biosafety	Learn everything you need to know to survive in the laboratory. Learn how to perform an experiment inside a Biosafety containment level.
II. Molecular Cloning Enzyme Kinetics FACS	Learn about recombinant DNA technology with cell division, transcription and translation. Includes concepts in restriction enzymes, cloning and reporter genes Learn how to use a spectrophotometer, perform enzyme kinetics experiment, analyze data and understand different inhibition mechanisms. Learn the basics of flow cytometry and how to use a flow cytometer with fluorescence detection.
III. Synthetic Biology	Cutting edge research and design a biological circuit that can sense and destroy cancer cells.
IV. Biological Circuit	Cutting edge research and to engineer a biological circuit. Learn all the steps from the initial circuit construction, Gibson assembly, and in vivo testing
V. Genetically Engineered Machine	In this simulation students will join an iGEM team to design a biosensor.
VI. Wet Laboratory	Hands on laboratory experiences.

Student Support and Success

John B. Coleman Library
The library and its partners have as their mission "to provide resources and instructional material in support of the evolving curriculum, as a partner in Prairie View A&M University's mission of teaching, research, and service" and to support the University's core values of "access and quality, diversity, leadership, relevance, and social responsibility" through emphasis on ten key areas of service. It maintains library collections and access both on campus, online, and through local agreements to further the educational goals of students and faculty.

Center for Academic Support
The Center for Academic Support (CAS) offers Tutoring via peer tutoring. The services include workshops (i.e., Save My Semester, Recalculate Your Route), seminars (i.e., Tools You Can Use: TI-84), group review sessions (i.e., College Algebra Topic Reviews, GRE Preparation), group study opportunities (i.e., TSIA, HESI, Study Break, Exam Cram), and test-taking strategies (How to take Notes, Study Buddy, 5 Day Study Guide). The Tutoring Center is a nationally certified tutoring program through the National Tutoring Association. The peer tutors are trained and certified by the coordinator each semester. Location: J.B. Coleman Library

COMPASS
The Center for the Oversight and Management of Personalized Academic Student Success (COMPASS) is designed to help Prairie View students in their second year and beyond navigate towards graduation by providing the following services: Academic Advisement, Targeted Tutorials for Personalized Learning, Campus-Wide Referrals, and Academic & Social Workshops. Location: J.B. Coleman Library

Writing Center
The Writing Center provides student consultants on all aspects of the writing process and a variety of writing assignments. Writing Center consultations assist students in such areas as prewriting, brainstorming, audience awareness, organization, research, and citation. Location: Hilliard Hall 121

University Rules and Procedures

Disability statement (See Student Handbook):
Students with disabilities, including learning disabilities, who wish to request accommodations in class should register with the Services for Students with Disabilities (SSD) early in the semester so that appropriate arrangements may be made. In accordance with federal laws, a student requesting special accommodations must provide documentation of their disability to the SSD coordinator.

Academic misconduct (See Student Handbook):

You are expected to practice academic honesty in every aspect of this course and all other courses. Make sure you are familiar with your Student Handbook, especially the section on academic misconduct. Students who engage in academic misconduct are subject to university disciplinary procedures.

Forms of academic dishonesty:

1. Cheating: deception in which a student misrepresents that he/she has mastered information on an academic exercise that he/she has not mastered; giving or receiving aid unauthorized by the instructor on assignments or examinations.
2. Academic misconduct: tampering with grades or taking part in obtaining or distributing any part of a scheduled test.
3. Fabrication: use of invented information or falsified research.
4. Plagiarism: unacknowledged quotation and/or paraphrase of someone else's words, ideas, or data as one's own in work submitted for credit. Failure to identify information or essays from the Internet and submitting them as one's own work also constitutes plagiarism.

Nonacademic misconduct (See Student Handbook)

The university respects the rights of instructors to teach and students to learn. Maintenance of these rights requires campus conditions that do not impede their exercise. Campus behavior that interferes with either (1) the instructor's ability to conduct the class, (2) the inability of other students to profit from the instructional program, or (3) campus behavior that interferes with the rights of others will not be tolerated. An individual engaging in such disruptive behavior may be subject to disciplinary action. Such incidents will be adjudicated by the Dean of Students under nonacademic procedures.

Sexual misconduct (See Student Handbook):

Sexual harassment of students and employers at Prairie View A&M University is unacceptable and will not be tolerated. Any member of the university community violating this policy will be subject to disciplinary action.

Attendance Policy

Prairie View A&M University requires regular class attendance. Excessive absences will result in lowered grades. Excessive absenteeism, whether excused or unexcused, may result in a student's course grade being reduced or in assignment of a grade of "F". Absences are accumulated beginning with the first day of class.

Student Academic Appeals Process

Authority and responsibility for assigning grades to students rests with the faculty. However, in those instances where students believe that miscommunication, errors, or unfairness of any kind may have adversely affected the instructor's assessment of their academic performance, the student has a right to appeal by the procedure listed in the Undergraduate Catalog and by doing so within thirty days of receiving the grade or experiencing any other problematic academic event that prompted the complaint.

Disability statement (See Student Handbook):

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TECHNICAL CONSIDERATIONS

***Minimum* Recommended Hardware and Software:**

- Intel PC or Laptop with Windows 7; Mac with OS X; Smartphone or iPad/Tablet with Wi-Fi
- High speed Internet access
- 8 GB Memory
- Hard drive with 320 GB storage space
- 15" monitor, 800x600, color or 16 bit
- Sound card w/speakers
- Microphone and recording software
- Keyboard & mouse
- Most current version of Google Chrome, Safari, Internet Explorer or Firefox

Note: Be sure to enable Java & pop-ups

Participants should have a basic proficiency of the following computer skills:

- Sending and receiving email
- A working knowledge of the Internet
- Proficiency in Microsoft Word (or a program convertible to Word)
- Proficiency in the Acrobat PDF Reader
- Basic knowledge of Windows or Mac O.S.

***Netiquette* (online etiquette):**

Students are expected to participate in all discussions and virtual classroom chats as directed. Students are to be respectful and courteous to others on discussions boards. Foul or abusive language will not be tolerated.

***Technical Support*:**

Students should go to https://mypassword.pvamu.edu/ if they have password issues. The page will provide instructions for resetting passwords and contact information if login issues persist. For other technical questions regarding eCourses, call the Office of Distance Learning at 936-261-3283

***Communication Expectations and Standards*:**

Emails or discussion postings will receive a response from the instructor, usually in less than 48 hours. Urgent emails should be marked as such. Check regularly for responses.

Discussion Requirement:

Online courses often require minimal to no face-to-face meetings. However, conversations about the readings, lectures, materials, and other aspects of the course can take place in a seminar fashion. This will be accomplish by the use of the discussion board. The exact use of discussion will be determined by the instructor.

It is strongly suggested that students type their discussion postings in a word processing application and save it to their PC or a removable drive before posting to the discussion board. This is important for two reasons: 1) If for some reason your discussion responses are lost in your online course, you will have another copy; 2) Grammatical errors can be greatly minimized by the use of the spell-and-grammar check functions in word processing applications. Once the post(s) have been typed and corrected in the word processing application, it should be copied and pasted to the discussion board.

Academic Calendar Fall 2019 – Full Term

The Prairie View A&M Academic Calendar is subject to change

Jun 15 Saturday	Deadline to Submit Financial Aid Verification Documents
Jun 15 Saturday	Financial Aid Satisfactory Academic Progress (SAP) Appeal Deadline
Aug 22 Thursday	Registration for All Students
Aug 26 Monday	First Class Day
Aug 26 Monday	Tuition & Fees Payment Due Date
Aug 26 - Sep 03 Monday through Tuesday	Attendance Reporting Period (NS/SH) Students who do not attend class during this period will have their courses removed and financial aid reduced or cancelled
Aug 26 Monday	Late Registration Fee Begins ($50.00)
Aug 31 Saturday	Final Day to Add a class(s) for credit
Aug 31 Saturday	Final Day to Register with Late fee
Sep 02 Monday	Labor Day Holiday (University Closed)
Sep 09 Monday	Financial Aid Refunds Begin
Sep 11 Wednesday	12th Class Day (Census Date)
Sep 11 Wednesday	Final Day to Drop/Withdraw from Course(s) without Academic Record (A Financial Record will still exist)
Sep 12 Thursday	Withdrawal from Courses with Academic Record ("W") Begins
Sep 17 Tuesday	Drop for Non-Payment of Tuition and Fees @ 5:00 p.m.
Oct 17 - Oct 19 Thursday through Saturday	Mid-Semester Examination Period
Oct 22 Tuesday	Mid-Semester Grades Due
Oct 31 Thursday	Final Date to Apply for Fall 2019 Graduation (ceremony participation)
Nov 01	Application for Graduation-Degree Conferral
Friday	only for Fall 2019 Graduation Begins (no ceremony participation or name listed in the program)
Nov 01 Friday	Final Day to Withdraw from Course(s) with Academic Record ("W") – Fall 2019 16-week session
Nov 11 Monday	Priority Registration for continuing students for Spring and Summer semesters
Nov 18 Monday	Pre-Registration for all other student for the Spring and Summer semesters
Nov 28 - Nov 30 Thursday through Saturday	Thanksgiving Holiday (University Closed)
Dec 02 - Dec 03 Monday through Tuesday	Course Review Days (Classes must convene and instructors will prepare students for final exams)
Dec 03 Tuesday	Final Day to Apply for Degree Conferral only for Fall 2019 Graduation (no ceremony participation or name listed in the program)
Dec 03 Tuesday	Last Class Day
Dec 03 Tuesday	Final Day to Submit Application for Tuition Rebate for Fall Graduation 2019 (Undergraduate Candidates)
Dec 03 Tuesday	Final Day to Withdraw from the University (from all courses) for the Fall 2019 16-week session
Dec 04 - Dec 10 Wednesday through Tuesday	Final Examination
Tuesday Dec 10	**SYNTHETIC BIOLOGY FINAL EXAM, 8AM-10AM**
Dec 12 Thursday	Final Grades due for Graduation Candidates (12:00 p.m.) – Fall 2019 16-week session
Dec 14 Saturday	Commencement
Dec 17 Tuesday	Final Grades due for all other students (11:59 p.m.)

FINAL EXAM SCHEDULE FALL 2019 SEMESTER EXAM WEEK

TIMES	Wednesday Dec 4	Thursday Dec 5	Friday Dec 6	Saturday Dec 7	Monday Dec 9	Tuesday Dec 10
8:00am–10:00am	M-W-F, 8:00 am	TU-THUR, 8:00 am	M-W-F, 9:00 am	SAT, 8:00 am	M-W-F, 10:00 am	TU-THUR, 9:30 am
10:30am12:30pm	M-W-F, 11:00 am	TU-THUR, 11:00 am	M-W-F, 12:00 pm	SAT, 11:00 am	M-W-F, 1:00 pm	TU-THUR, 12:30 pm
1:30pm–3:30pm	M-W-F , 2:00 pm	TU-THUR, 2:00 pm	M-W-F , 3:00 pm	SAT, 2:00 pm	M-W-F, 4:00 pm	TU-THUR, 3:30 pm
4:00pm–6:00pm	M-W-F , 5:00 pm	TU-THUR , 5:00 pm	M-W-F , 6:00 pm	COMMON EXAM	COMMON EXAM	COMMON EXAM
6:30pm–8:30pm	COMMON EXAM	COMMON EXAM	COMMON EXAM	COMMON EXAM	COMMON EXAM	COMMON EXAM

NOTES:

1. **All NROTC and AROTC examinations will be scheduled by the professors of NROTC and AROTC during this final exam period.**
2. **All HEALTH AND HUMAN PERFORMANCE practice examinations will be scheduled by the head of the Department of Health and Human Performance during this final exam period.**
3. **Instructors should contact the Office of the Registrar as soon as possible at the beginning of the semester to schedule rooms for common exams.**
4. **Final Exam schedules for 8-week sessions will follow the Academic Calendar.**