Colonnade Program Course Proposal: Explorations Category

1. What course does the department plan to offer in Explorations? Which subcategory are you proposing for this course? (Natural and Physical Sciences)

Biology 114/114C General Biology
Note: This laboratory fulfills the foundational requirement of a laboratory experience in the sciences.

2. How will this course meet the specific learning objectives of the appropriate subcategory. Please address **all** of the learning outcomes listed for the appropriate subcategory.

1. Demonstrate an understanding of the methods of science inquiry.
Through laboratory exercises, quizzes, homework assignments, online exercises and examinations understanding on the methods and approaches to science is assessed.

2. Explain basic concepts and principles in one or more of the sciences.
This is accomplished through laboratory material, electronic modules that include comprehension assessment and discussions in the laboratory.

3. Apply scientific principles to interpret and make predictions in one or more of the sciences.
Through online modules and in lab problems and experiments often based on case studies, students work singly and in groups to create and examine scientific hypotheses and predictions.

4. **Explain how scientific principles relate to issues of personal and/or public importance.**
The abilities to acquire and evaluate information, think critically and assess the source of information are all important skills for global citizens. The principle topics in this course include cell theory, genetics, evolution, metabolism, energy flow, anatomy and physiology (structure and function), ecology and biodiversity. These areas provide foundational information for human and environmental health issues that affect people across the planet. While this is not an applied course, case studies and other real world examples used in the class connect the basic principles of biology to the human condition.

3. Syllabus statement of learning outcomes for course. NOTE: In multi-section courses, the same statement of learning outcomes must appear on every section's syllabus.

This course fulfills the Natural Science Explorations Category of Colonnade. Students will gain the ability to:

1. Demonstrate and understand the methods of scientific inquiry in biology
2. Explain basic concepts and principals in biology
3. Apply scientific principles to interpret and make predictions in biology
4. Explain how scientific principles relate to issues of personal and/or public importance

4. Brief description of how the department will assess the course for these learning objectives.

We will create a summative assessment with questions that target each of the four learning objectives listed above. There will be ten questions for each objective with a satisfactory score of 70%. This assessment will be executed via Blackboard at the end of the course for all sections. Because this lab accompanies BIOL 113 but is not required for BIOL 113, students may take one but not both. Although this is somewhat rare, we will use the same category of questions for each course to examine assessment. However, we will tailor some questions for the lab to focus on learning processes more specific to the lab experience.

Objective	Assessment Question Categories
the methods of scientific inquiry	• Steps in the scientific method and their order • Composition of each step • Relationship of scientific method to hypothesis formulation and writing in biology • Inductive and Deductive reasoning – identification and role of each and the related concept of falsification • Evaluating the scientific validity of information gathering including related topics of beliefs, biases and models
basic concepts and principals	• Critical Thinking & Scientific Method • Cell Theory, Macromolecules, Biochemistry • Genetics • Metabolism and Energy • Evolution • Structure and Function • Ecology and Biodiversity
scientific principles: interpret / make predictions	• Aligning principles, hypotheses and predictions • Experimental design • Variables, data presentations and data interpretation • Evaluation of hypotheses and theories • Formulating of hypotheses and predictions
relate to everyday life	Based on the major concepts/principles shown above, applications to: • conservation • human and environmental health • problem-solving • sustainability • technology

5. How many sections of this course will your department offer each semester?

We offer approximately 10 sections on main campus during the day, at South Campus and often at the WKU-Glasgow campus with one online section per semester.

6. Please attach sample syllabus for the course.

Please find a generalized syllabus without any individual instructor information.

Please send your proposal to: robert.dietle@wku.edu
As of September 2013 to: molly.dunkum@wku.edu

Explanation for why the Department of Biology is requesting this course should be listed in the Natural Science Explorations Category of Colonnade along with other courses offered by the Department of Biology:

Biology 114/114C is a complementary laboratory for BIOL 113/113C and offers an opportunity to explore the learning objectives in a one semester framework as opposed to BIOL 121 or 123, which cover similar material in greater depth. BIOL 114/114C is open to any WKU student.

WKU Generalized Syllabus for BIOL 114/C: General Biology Laboratory

BIO 114 - Syllabus/Schedule/Virtual Lab Manual

Labs will begin the second week of classes!

There is no lab manual to purchase!

Note: Further online material can be found at https://blackboard.wku.edu. Login using the instructions found on that page. There is no lab manual to purchase, because the lab manual is virtual and can be accessed through the links in the schedule below.

BIO 114 Course Description - 1-hr. credit. This laboratory course for non-science majors illustrates the processes, concepts, and principles discussed in Biology 113 through investigative activities that emphasize examples from everyday life.

As these processes are studied, the student should:

- Learn to think analytically about life processes.
- Be able to analyze and focus on the best way of determining an appropriate procedure to answer a question.
- Gather and interpret data, follow-up on meaningful data, and draw conclusions based on the data.
- Communicate in ways appropriate to the biological sciences, about the processes studied and results obtained.
- Become familiar with the use of computers to gather and analyze data.

Bio 114 Tentative Lab and Assignment Schedule

Always check with your instructor regarding each week's assignment!

Your Virtual Lab Manual!

(Click on the links for all of your assignments)

Week of (Lab Number)	Homework assignments due *You must complete these assignments online, print them (use ALL links), and bring to class to be graded.	Quiz Will be on paper, in class - NOT online. Covers the material stated below.	In-Class Lab *You must print and bring to class!
Week 1	NO BIOLOGY 114 LABS THIS WEEK		
Week 2	No homework	No quiz	**INTRODUCTION** to lab practices, equipment, data presentation. **HANDOUTS WILL BE PROVIDED FOR THIS LAB ONLY.** **COMPLETED IN CLASS TODAY:** 1. Controls and Variables (2.5 pts.). 2. Graphing (7.5 pts.). 3. Introduction (10 pts.). 4. Sign the lab safety sheet.
Week 3	1. Virtual Osmosis/Diffusion Lab (10 pts.). Do the set of six questions at the end of the last page. Note that you have to run through the entire simulation to reach the questions. 2. Scientific Method Gen. Ed. Assessment (20 pts.)	**Quiz 1** (Introduction)	**DIFFUSION/OSMOSIS LAB** Print the Osmosis Lab Instructions AND THE Osmosis Lab Data Sheet to complete in lab.
Week 4	1. Virtual Spectroscopy Lab (10 pts.). Make sure you answer all questions, fill in the blanks and do the graph.	**Quiz 2** (Diffusion/Osmosis)	**SPECTROSCOPY LAB** Print a blank copy of the last page of the Virtual Spectroscopy Lab (Virtual Spectroscopy Lab) of unknowns and graph.

Week 5	1. Virtual Enzyme Lab (10 pts.)	**Quiz 3** (Spectroscopy Lab)	**ENZYME LAB** *You must wear **goggles** for this lab! Your lab instructor will provide goggles for you to wear. Bring the Enzyme Lab Instructions AND THE Enzyme Lab Data Sheet to complete in lab.
Week 6	1. Virtual Photosynthesis Lab (10 pts.).	**Quiz 4** (Enzyme Lab)	**PHOTOSYNTHESIS LAB** *You must wear **goggles** for this lab! Your lab instructor will provide goggles for you to wear. Print the Photosynthesis Lab Instructions AND THE Photosynthesis Lab Data Sheet for use in lab.
Week 7	1. Virtual Respiration Lab (10 pts.). 2. Review of **MICROBIOLOGY I LAB** (no points).	**Quiz 5** (Photosynthesis) **1st Notebook Check (10 pts.)**	**RESPIRATION & MICROBIOLOGY I LAB** Print the Virtual Respiration Lab (your data sheet) AND THE Respiration Lab Instructions for use in the lab.
Week 8	**No Bio 114 Labs Meet This Week**		
Week 9	1. Mitosis Lab (20 pts.). 2. Microbiology II Lab (8 pts).	**Quiz 6** (Respiration)	**MITOSIS & MICROBIOLOGY II LAB** Print the Mitosis Lab worksheet for use in lab.

Week 10	1). Virtual Corn Genetics Lab (5 pts.). 2. Virtual Foraging Lab (20 pts).	**Quiz 7 and Quiz 8** (Mitosis **AND** Microbiology)	**HUMAN & CORN GENETICS and MICROBIOLOGY III LAB** 1. Print the Human Genetics Lab (5 pts.) for use in lab. 2. Print the Corn Genetics Lab Data Sheet (10 pts.) for use in lab. 3. Print the Microbiology III Lab (12 pts) for use in lab.
Week 11	1. Virtual Animal Behavior Lab (20 pts.).	**Quiz 9** (Genetics and Virtual Foraging)	**TAXONOMY LAB** 1. Taxonomy Lab (20 pts.). Print a blank copy of this lab for use in lab. 2. Print a copy of the "In Case of Rain" version of the Taxonomy Lab, just in case.
Week 12	1. Virtual Anatomy Lab II (10 pts.). Assignment completed before lab.	**Quiz 10** (Taxonomy and Animal Behavior)	**ANATOMY LAB I** 1. Print out a blank copy of Anatomy Lab I (10 pts.)
Week 13	None	**Quiz 11** (Anatomy)	**REVIEW FOR FINAL LAB EXAM**
Week 14	None	**Final Notebook Check (10 pts.)**	**FINAL LAB EXAM (50 PTS.)**
Week 15	**Bio 114 Labs Over**		
Week 16 FINALS WEEK	**Bio 114 Labs Over**		

Grading scheme:

Scientific Method Gen. Ed. Assign. (required)	**20**
10 quizzes @ 20pts each	**200**
12 in-class labs or homework assignments @ 20pts each	**240**
2 Notebook checks @ 10pts each	**20**
Final Lab Exam	**50**
Total Points	**530**

> 90% = **A**, 80-89% = **B**, 70-79% = **C**, 60-69% = **D**, below 60% = **F,** failure due to non-attendance - financial aid has to be paid back in this case = **FN**. Note that student loans are not bankruptable.

***Late Assignment Penalty** = **- 5 pts for up to 1 week late, work over 1 week late will not be accepted (will receive a 0) because other students will have their corrected work returned by then.**

Natural Science Explorations Category of Colonnade

This course fulfills the Natural Science Explorations Category of Colonnade. Students will gain the ability to:

1. Demonstrate and understand the methods of scientific inquiry in biology
2. Explain basic concepts and principals in biology
3. Apply scientific principles to interpret and make predictions in biology
4. Explain how scientific principles relate to issues of personal and/or public importance

Safety: Safety is of utmost concern in Bio 114 labs. Click this link for Bio 114 Safety Information. [These are PowerPoint Slides. If you do not have power point on your computer, you can get a free viewer from Microsoft by clicking on the link below. The link will take your computer to the Microsoft web site. Microsoft PowerPoint Viewer. If you cannot view them on your own computer, use one on campus. (When printing PowerPoint slides, you might want to select to "Print 6 slides per page" in order to save paper.)] You must sign a Student Safety Contract in order to take the course. Your instructor will discuss safety and present you with the form on the first day of lab.

Course Requirements: This is a non-majors Biology course and has no prerequisites. There is no book for this class. All the material you need is Online. You will also need to purchase one 1 1/2-inch three-ring notebook to record assignments. Requirements for this class include either prior knowledge of how to use a typical web site, or a willingness to learn on your own during the first week of class. This is because course announcements, lessons, all reading assignments, most quizzes, and details explaining the policies for this course are found on the Internet.

Computer-based learning: Owning your own computer is not required for successful completion of this course. There are several computer labs located throughout the campus: at the Library, DUC, TCCW, etc. Click here for a link to WKU's computer lab locations and hours of operation: WKU Computer Labs. However, most students find that it is more convenient to have his/her own computer with access to the Internet (located in his/her own room). Since a computer can be the most valuable tool you can have while in college, it is strongly suggested that you purchase one. The computer that you use must have the following FREE software installed: Either Browser (e.g. Netscape or Internet Explorer) version 4.0 or higher and the plug-ins listed on the Bio 113 Intro Page . The course looks, and works, much better with Internet Explorer.

To receive the full benefit of our website, you need 4 FREE "Plug-ins" (e.g. Flash, Quicktime, and Real Player). Plug-ins are little programs that work with your browser, expanding its capabilities, so that you can view motion and sound over the Internet. The computers at DUC, the Libray and Grise already have the plugins installed. Again, these Plug-ins are FREE; you do not need to order or pay for the Plug-ins. See the Bio 113 Intro Page for a list of the plugins.

Need Help?

If you find the course incomprehensible or need extra help, be sure to **contact your Instructor/Teaching Assistant**- see "Staff Information" in Blackboard. His/her contact info will also be posted on the lab door, 210 TCNW. I only coordinate the Bio 114 labs. But if there is a problem that your T.A. has not been able to help you with, you may call or e-mail me, come to my office, or schedule an appointment with me: Dr. S. Jacobshagen. If you know there is some reason that you will have to miss a lab, contact your T.A. BEFORE the due date, exam date, etc. as he/she will be more than happy to help. Do not wait until afterwards or until the last second (i.e. the night before).

Study Strategies: Click on this link for study strategies, such as a method called SQ5R, Note Taking, and Concept Mapping. These strategies will help you study for any class.

The Learning Center: Should you require academic assistance with your WKU courses, The Learning Center (located in the Downing University Center, A330) provides free supplemental education programs for all currently enrolled WKU students. TLC @ DUC offers certified, one-on-one tutoring in over 200 subjects and eight academic skill areas by appointment or walk in. Online tutoring is offered to distance learners. TLC is also a quiet study area (with side rooms designated for peer-to-peer tutoring) and offers a thirty-two machine Dell computer lab to complete academic coursework. Additionally, TLC has three satellite locations. Each satellite location is a quiet study center and is equipped with a small computer lab. These satellite locations are located in Douglas Keen Hall, McCormack Hall, and Pearce Ford Tower. Please call TLC @ DUC at (270) 745-6254 for more information or to schedule a tutoring appointment. www.wku.edu/tlc

Hours of Operation:

TLC @ DUC
Sunday 4:00pm – 9:00pm
Monday – Thursday 8:00am – 9:00pm
Friday 8:00am – 4:00pm

TLC @ Keen
Sunday – Thursday 6:00pm – 11:00pm

TLC @ McCormack
Sunday – Thursday 6:00pm – 11:00pm

TLC @ PFT
Sunday – Thursday 6:00pm – 11:00pm (PFT residents and their guests only)

According to The Learning Center: "If anyone needs to meet with a tutor outside of those hours, all they need to do is ask! We will try our best to accommodate each student's schedule!" There are NO EXCUSES for turning down READILY ACCESSIBLE FREE HELP! Don't wait until it is mathematically impossible to succeed in a class before getting help.

Link to info on MANY other free tutoring resources at WKU:
http://www.wku.edu/Dept/Support/AcadAffairs/CTL/tutoringhandout.html

Methods - Each lab period, you will participate in the scheduled lab exercise or experimental activity for that day: Many of the exercises take place over the course of several lab periods. In order to benefit maximally from the lab activities, you need to plan to spend the required time working on each lab, and not attempt to rush to finish early. Any part of an experiment that is not finished one week must eventually be completed.

Before the lab period, you should prepare for class by reading and thinking about the information provided on the Bio 114 web site. While in lab, you should take the time to observe closely, be thorough in your work, and perhaps take notes. This should give you better data, and allow you to better absorb and learn the material, thereby **improving your ability to perform well on quizzes**. You might prepare and maintain a laboratory notebook into which you can put all information and handouts as well as your own data and analyses.

After you have completed a laboratory exercise, you are expected to spend time analyzing what you did and the significance of your results. Answers to questions may need to be included with lab data to hand-in. Frequently, you may also have to prepare materials for next week's lab before you leave, or perform a virtual lab at your convenience prior to the next lab meeting. For a number of lab exercises, you will be expected to hand-in data collected during the current, or previous lab.

In-Class Labs: Each week you will perform experiments in the lab, most of which you have had practice with from the online homework assignment link(s) from the previous session. Note that **In-Class Labs** CANNOT **be made up for any reason**. The labs are prepared by the Lab Coordinator on a set schedule that cannot be altered. Also, you will not be allowed to attend other lab sections, as this would create too much chaos for the other lab instructors and students and would potentially violate safety rules for having too many students in one lab.

Homework Assignments: You must PRINT and BRING TO CLASS all work to be graded! Unlike the lecture, your lab instructor cannot access your submissions on the web (this is in progress, but we are not there yet). Attempt to answer all the questions in the virtual lab manual to the best of one's ability. Direct questions to the instructor or the teaching assistant if help is needed, however, the student should not expect them to carry out his/her work. Note that the answers to some of the questions result from the subsequent analysis of the experimental data obtained in class or virtual lab. Also, note that **you will be able to type in some of your answers on the computer and others you will have to write on the printout**.

Quizzes: There will be a quiz worth 20 pts each and every lab period. Quizzes are given on paper during the first fifteen minutes of the lab period. If you are late, you will miss the quiz. **Your instructor reserves the right to not allow quizzes to be made up**. Grades will not be adjusted for any labs that you miss --"I wasn't there" is not a reason for not learning the material, or not taking the quiz and then expecting credit. **The material covered by each quiz is stated on the syllabus/schedule.**

Notebook Checks: You should takes notes from each week's pre-lab lecture and note what your homework assignment is for the following week. Your notebook check grade will be based on the presence and quality of these notes as well as the presence of graded assignments that have been returned to you by your instructor. Your instructor will advise you on how to organize your notebook. The graded contents of your notebook will be taken up and the end of the semester by your instructor for the final notebook check.

Final Lab Exam: The Final Lab Exam is cumulative, worth 50 pts., and will be given on the last lab meeting (see schedule below). It will consist of "results analysis" of all of the labs, so you must know how to interpret results of the experiments.

Grades: Grades will be determined based on the total of the points from the quizzes, in-class labs, homework assignments, notebook checks, and lab final exam. **Each week, the in-class lab assignment and the homework assignment will be graded for a combination of 20 pts.** Only the top 10 quizzes and only the top 12 in-class/homework assignments will count, therefore, you will get to drop your lowest quiz and your lowest in-class/homework assignment. **If you are absent for one lab period for ANY reason, it will count as a dropped grade. If you are absent for more than one lab for ANY reason, zeros will be substituted for grades for missed quizzes and assignments**, unless other arrangements have been made with your lab instructor (other arrangements are made at the discretion of the lab instructor)**.** Attendance during at least eight lab sessions is a minimal requirement of the course. **In-class labs cannot be made up for any reason. Note that the grade for the Scientific Method Gen. Ed. Assignment CANNOT be dropped. This is a required assignment.** The grading categories will be listed in the Check Grade section of Tools in Blackboard.

Note that the lab is different from lecture in that **YOU MUST PRINT AND BRING TO CLASS ALL WORK TO BE GRADED** (i.e., don't just press "Submit" because your instructor is not able to receive assignments this way via the web, unlike the lecture. Your final grade will be awarded based on your percentage of the total points possible.

To Get a Good Grade in This Course:

1. COME TO EVERY LAB
2. PAY ATTENTION

3. TAKE GOOD NOTES
4. IF YOU ARE EVER ABSENT: You should plan to set aside an hour to go over the material missed in class, since each class lasts for an hour, plus another hour or two or more to study the material and pick out the important information for EACH TIME YOU MISS CLASS. Remember that your instructor probably has 1-2 more college degrees than most of you, and that it is his/her job to present the material to you in such a way that the important points are emphasized (i.e., things that you are most likely to be tested on) and difficult material is explained in such a way that you understand it. In our experience, if you choose to take these tasks on and attempt to teach yourself, you will end up achieving at least a letter grade lower than if you had let your instructor do his/her job. Also, you should contact your instructor immediately regarding your absence. Remember that in-class labs cannot be made up and that your instructor may or may not allow makeup quizzes and/or homework.

Grading for Assignments:

Introduction (1) Assignment (20 pts.): Controls and Variables (2.5 pts.) + Graphing (7.5 pts.) + Introduction (10 pts.)
Spectroscopy (2) Assignment (20 pts.): Virtual Spectroscopy Lab (10 pts.) + Spectroscopy Lab in class (10 pts.)
Osmosis/Diffusion (3) Assignment (20 pts.): Virtual Osmosis/Diffusion Lab (10 pts.) + Osmosis/Diffusion Lab in class (10 pts.)
Enzyme (4) Assignment (20 pts.): Virtual Enzyme Lab (10 pts.) + Enzyme Lab in class (10 pts.)
Animal Behavior (5) Assignment (20 pts.): Virtual Animal Behavior Lab (20 pts.)
Photosynthesis (6) Assignment (20 pts.): Virtual Photosynthesis Lab (10 pts.) + Photosynthesis Lab in class (10 pts.)
Microbiology (7) Assignment (20 pts.): Microbiology II (8 pts.) + Microbiology III (12 pts.)
Respiration (8) Assignment (20 pts.): Virtual Respiration Lab (10 pts.) + Respiration Lab in class (10 pts.)
Mitosis (9) Assignment (20 pts.): Mitosis Lab in class (20 pts.)
Genetics (10) Assignment (20 pts.): Virtual Corn Genetics Lab (5 pts.) + Corn Genetics Lab in class (10 pts.) + Human Genetics Lab in class (5 pts.)
Foraging Lab (11) Assignment (20 pts.): Virtual Foraging Lab (20 pts.)
Taxonomy Lab (12) Assignment (20 pts.): Taxonomy Lab in class (20 pts.)
Anatomy Lab (13) Assignment (20 pts.): Anatomy Lab I (10 pts.) and Virtual Anatomy Lab II (10 pts.)
Scientific Method Assignment (20 pts.).

NOTE: The lowest quiz score and the lowest 10 pt assignment score will be dropped.

Family Educational Rights and Privacy Act: Due to the Family Educational Rights and Privacy Act (FERPA), if you are 18 years old or older, the instructor cannot discuss your grades, etc. with your parents.

Academic Misconduct: Dishonesty on quizzes, exams, or written assignments (see WKU's plagiarism statement below) will result in a failing grade for the class. Computers are wonderful things. Each time you send me an assignment the computer tells me where you are and when you sent it (and more if I wish). This means I can tell when two people take the same quiz or assignment from the same computer within a short period of time. If the assignment is for credit then this is cheating and it will not be tolerated.

WKU's Plagiarism Definition: "To represent written work taken from another source as one's own is plagiarism. Plagiarism is a serious offense. The academic work of a student must be his/her own. Once must give any author credit for source material borrowed from him/her. To lift content directly from a source without giving credit is a flagrant act. To present a borrowed passage without reference to the source after having changed a few words is also plagiarism."

Withdrawals and Section Changes: If you wish to withdraw from the course you should do so by the dates mandated by the University. Be sure you are aware of these dates because credit for the course will not be changed to an audit after the university designated time. You also cannot drop the class or change to Audit or Withdraw after the designated time. Be aware that IT IS YOUR RESPONSIBILITY TO DROP THE CLASS. Do not assume that I will do this for you. University policy states, "Students who, without previous arrangement with the instructor or

department, fail to attend the first two class meetings of a course meeting multiple times per week or the first meeting of a class that meets one time per week MAY be dropped from the course; however, students are responsible for officially dropping any course for which they have enrolled."

You should also make any changes to the lab section in which you would like to be on Topnet, by the university-designated date. Any excuses later in the semester regarding your performance in the lab in relation to the time of day for which you signed up or the instructor you have will NOT be valid or accepted.

Disabilities: "In compliance with university policy, students with disabilities who require accommodations (academic adjustments and/or auxiliary aids or services) for this course must contact the Office for Student Disability Services in DUC A-200 of the Student Success Center in Downing University Center. Please DO NOT request accommodations directly from the professor or instructor without a letter of accommodation from the Office for Student Disability Services." If you need extra time on assignments or quizzes, you must make arrangements with your instructor PRIOR TO THE DUE DATE of the assignment or quiz. Accommodations cannot be made retroactively.