Add Course Request

Submitted on: 2012-11-14 14:01:42

1. **COURSE SUBJECT**	PNB
2. **COURSE NUMBER** (OR PROPOSED NUMBER)	3264W
3. **COURSE TITLE**	Molecular Principles of Physiology
4. **INITIATING DEPARTMENT or UNIT**	Physiology and Neurobiology
5. **NAME OF SUBMITTER**	Rahul N Kanadia
6. **PHONE of SUBMITTER**	Phone: +1 860 486 8947
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8. **CONTACT PERSON**	Rahul Kanadia
9.**UNIT NUMBER of CONTACT PERSON** (U-BOX)	3156
10. **PHONE of contact person**	Phone: 860-486-2692
11. **EMAIL of of contact person**	Email: rahul.kanadia@uconn.edu
12. Departmental Approval Date	05-31-2011
13. School/College Approval Date	10-05-2012
14. Names and Dates of additional Department and School/College approvals	
15. Proposed Implementation Date	Term: Spring, Year: 2013
16.Offered before next printed catalog is distributed?	Yes
17. **General Education Content Area**	
18. **General Education Skill Code (W/Q).** Any non-W section?	W No
19. Terms Offered	Semester: Spring Year: Every_Year
20. Sections	Sections Taught: 2
21. Student Number	Students/Sections: 16
22. Clarification:	
23. **Number of Credits**	4 if VAR Min: Max: credits each term
24. **INSTRUCTIONAL PATTERN** Two one hour discussion and one 4 hour laboratory section	
25. Will this course be taught in a language other than	No

English?	If yes, then name the language:
26. Please list any prerequisites, recommended preparation or suggested preparation: Pre-requisites, PNB2274 or one of the following, MCB2410, MCB2210, MCB3010	
27. Is Instructor, Dept. Head or Unit **Consent Required**?	Instructor
28. Permissions and Exclusions: Open only to Juniors or higher	
29. Is this course **repeatable for credit**?	No If yes, total credits allowed: Allow multiple enrollments in same term?
30. **Grading Basis**	Graded
31. If satisfactory/unsatisfactory grading is proposed, please provide **rationale**:	
32. Will the course or any sections of the course be taught as Honors? AsHonors	
33. Additional Details:	
34. Special Attributes:	
35. **REGIONAL CAMPUS AVAILABILITY**: not available at regional campuses, because this course requires specialized instrumentation for the laboratory sections.	
36. PROVIDE THE PROPOSED TITLE AND COMPLETE CATALOG COPY: PNB-3XXXW - Molecular Principles of Physiology Four credits. Two Class periods and one 4-hour laboratory. Prerequisite: PNB 2274, or MCB 2410, or MCB 3010; Open to juniors or higher. Instructor consent required. Case study of a disease: genetics and inheritance patterns, molecular defects, including transcription and posttranscription defects, physiological defects, therapeutic approaches	
37. **RATIONALE** FOR ACTION REQUESTED 1. Reasons for adding this course: (see Note L) Currently the PNB department offers only one W course by Dr. Moiseff in the first semester with a cap of 32 students. Consequently, many PNB majors do not get the opportunity to take a W course in our department. This course will help meet this need and accommodate the PNB majors W requirements. 2. Overlapping Courses (see Note M):None. 3. Number of Students Expected:32 4. Number and Size of Section:2 sections of 16 students 5. Effects on Other Departments (see Note N):The department that could potentially be affected is MCB. To address this issue, in the first semester of 2011 a flyer announcing the course and the appropriate details were sent to the MCB department. Dr. Kanadia has also sent the course announcement and description to Dr. David Knecht, who is the MCB representative to the CC&C committee and he has informed us that this course does not affect the MCB department.	
38. **SYLLABUS:**	

Online URL: (https://web2.uconn.edu/senateform/request/course_uploads/anp05007-1354550808-PNB-3XXX Syllabus.docx)

39. **Course Information: ALL General Education courses, including W and Q courses, MUST answer this question**

The new course, \"Molecular Principles of Physiology\", is the needed second W-course in the Physiology and Neurobiology major. It will enroll 32 students in 2 sections of 16 in the second semester. Dr. Kanadia has taught a smaller trial version of the new lab course this past semester through which he has gained critical insights and experience in running a case-based lab. Dr. Kanadia will present a case study of a disease starting with the symptoms, followed by the inheritance pattern, genetic defect, the corresponding molecular defect, the downstream physiological symptoms and finally some of the possible therapeutic strategies. This approach is designed to engage students at a more personal level as only a human disease can. The entire course will be couched within an historical context as reflected in the primary scientific literature. The design communicates to the students the importance of the synergy between clinical and basic science research and how each field builds upon the previous findings over a long period of time.
The laboratory and the “W” portion of this course are designed to allow students to integrate basic science knowledge acquired from primary publications and data gathered from their own experiments. For example, each group (2 students) will be assigned a gene with a known mutation that results in a disease. Students will be taught to collect the relevant primary literature and mine the database to construct the gene structure and the mutation(s). Each week, the students will be expected to produce a two page synopsis, with figures if necessary, of the primary literature and the data obtained in the laboratory. The synopsis generated each week will be edited and returned to the students for revisions, which will then be used toward the end of the semester for a 15-page long NSF or NIH format proposal with citations. Finally, the final report will also undergo a revision(s) prior to final submission. In regard to grades, the final proposal will be 75% of the grade and the weekly revised reports will account for the remaining 25%.

40. **Goals of General Education: All Courses Proposed for a Gen Ed Content Area MUST answer this question**

41. **Content Area and/or Competency Criteria: ALL General Education courses, including W and Q courses, MUST answer this question.:** Specific Criteria

a. **Arts and Humanities:**
b. **Social Sciences:**
c. **Science and Technology:**
    i. **Laboratory:**
d. **Diversity and Multiculturalism:**
    43. **International:**
e. **Q course:**
f. **W course:**

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experiments. For example, each group (2 students) will be assigned a gene with a known mutation that results in a disease. Students will be taught to collect the relevant primary literature and mine the database to construct the gene structure and the mutation(s). Each week, the students will be expected to produce a two page synopsis, with figures if necessary, of the primary literature and the data obtained in the laboratory. The synopsis generated each week will be edited and returned to the students for revisions, which will then be used toward the end of the semester for a 15-page long NSF or NIH format proposal with citations. Finally, the final report will also undergo a revision(s) prior to final submission. In regard to grades, the final proposal will be 75% of the grade and the weekly revised reports will account for the remaining 25%. The students must pass the W portion of this course to receive passing grade.

42. **RESOURCES:**

Does the department/school/program currently have resources to offer the course as proposed
YES
If NO, please explain why and what resources are required to offer the course.

43. **SUPPLEMENTARY INFORMATION**:

new syllabus uploaded on 12/3/12 following communication between proposers and W subcommittee.

ADMIN COMMENT:

Senate approved W 2.25.2013 // GEOCWapp_120312AP. revisedSyllabusUploaded_120312AP. newW_111612AP.

Course Information

PNB3298 "Molecular Principles of Physiology" is a 3 credits course with a wet laboratory component. This class focuses on principles governing gene organization, regulation of transcription, transcript processing, protein production, protein function and physiological output. Specifically, we are going to focus on how mutation in DNA can lead to aberrant molecular pathways including, RNA processing, protein production which then manifest as physiological defects. The overall goal of this course is to give you a thorough understanding of how basic science research is conducted with laboratory experience and how concepts crucial to molecular biology are used to formulate hypotheses. Importantly, you will be taught to directly test these hypotheses by conducting experiments followed by data collection and interpretation to conclude whether or not the data gathered supports the hypotheses. Greater emphasis will be placed on communicating the results and interpretation. The art of communicating results through data discussion, analysis and interpretation will figure prominently throughout the course.

Instructor

Asst. Prof. Rahul N Kanadia (TLS-121)

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Graduate Teaching Assistant

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Devi Krishna Priya Karunakaran dkpkaran@gmail.com

HuskyCT resources

Reference material for PNB3298 will be distributed through HuskyCT.

Students will submit written assignments as hard-copy.

Pre- and/or post lab exercises will be distributed and answered using HuskyCT.

Lecture/Lab

Lab 1: Bioinformatics

Lab 2: Retinal harvest and Isolation of RNA

Lab 3: cDNA preparation

Lab 4: Primer design, PCR

Lab 5: Agarose gel electrophoresis

Lab 6: Gel Extraction and pGEMT cloning

Lab 7: Colony PCR

Spring break

Lab 8: Plasmid isolation (Mini prep) and Restriction Digestion

Lab 9: Sequence analysis

Lab 10: Retina dissection and cryo preservation of blocks

Lab 11:Cryosection

Lab 12: H&E

Lab 13: Fluorescence Microscopy

Lab 14: Optional review

No food or drinks in the lab. NO texting and cellphone use in the lab. Lab partners cannot be swapped unless you get approval from the instructor. Please wear close toed shoes, lab coats and protective eye wears.

Lecture/Lab 1: Case Study of Retinitis Pigmentosa:

Brief talk about the mutation

Look up the gene on NCBI

Gene annotation

Introduction to Bioinformatics and Logistics

Prepare for a two page write-up

Lecture/Lab 2: Mouse Retina harvest and Isolation of RNA:

Turn in your two-page write-up from the previous week

Initial introduction

Mouse Retina Harvest

Homogenizer – each group

Tube transfer & spin

Chloroform, vortex'

Supernatant collection and Isopropanol

Receive edited document from TAs

Prepare for the next two page write-up

Lecture/Lab 3: cDNA preparation:

Turn in your two-page write-up from the previous week

Initial introduction

cDNA preparation

Receive edited document from TAs

Prepare for the next two page write-up

Lecture/Lab 4: Primer design, PCR and Agarose gel electrophoresis:

Turn in your two-page write-up from the previous week

Introduction DNA hybridization kinetics

Primer design

PCR

Gel electrophoresis (cut the bands out)

Receive edited document from TAs

Prepare for the next two page write-up

Lecture/Lab 5: Gel Extraction and pGEMT cloning:

Turn in your two-page write-up from the previous week

Gel electrophoresis continued

Gel extraction

Ligation

Transformation (Control – PCR fragment given by us)

Plating – overnight at 37 C

Receive edited document from TAs

Prepare for the next two page write-up

Lecture/Lab 6: Colony PCR :

Turn in your two-page write-up from the previous week

Colony PCR screen

Receive edited document from TAs

Prepare for the next two page write-up

Lecture/Lab 7: Plasmid isolation (Mini prep) and Restriction Digestion:

Turn in your two-page write-up from the previous week

Introduction

Mini prep

Restriction Digestion (Set up a digest beforehand with EcoR I)

Sending out for sequencing

Receive edited document from TAs

Prepare for the next two page write-up

Lecture/Lab 8: Sequence analysis:

Turn in your two-page write-up from the previous week

Introduction

Analysis of Sequences – NCBI Blast

Receive edited document from TAs

Prepare for the next two page write-up

Lecture/Lab 9: Mouse retina harvest and Cryo preservation of blocks:

Turn in your two-page write-up from the previous week

Introduction

Retina dissections

Mounting

Show cryosection

Receive edited document from TAs

Prepare for the next two page write-up

Lecture/Lab 10: Cryosection

Turn in your two-page write-up from the previous week

Introduction/sectioning

Receive edited document from TAs

Prepare for the next two page write-up

Lab 11: H&E staining:

Lab 12: Fluorescence Microscopy:

Final Exam:

Turn in your 15-page NIH/NSF style proposal with references on your assigned mutation that causes retinitis pigmentosa. This final report will be a compendium of the individual assignments that you have completed over the semester. This final report accounts for 75% of your final grade. This report must be submitted in time for it to undergo revisions, which will be crucial to the final grade assignment.

Notes:

1. You must arrive on time for your labs. Hard-copy of assignments must be handed in at the beginning of lab.

2. You should actively participate in the data discussion, which will be documented and will factor into your final grade.

3. Information will be disseminated via HuskyCT so be sure to check HuskyCT to see whether there are specific pre-class reading assignments posted.

Course Policies

Make sure you understand these policies; Resolve any questions about them with the instructor or the teaching assistants before a problem arises!

Attendance

Lectures. Lectures on Tuesdays will focus on introducing principles and concepts crucial to the laboratory and lectures on Thursdays will be focused on discussing the results obtained on Mondays and/or Wednesday labs.

Laboratory, TLS475. Laboratory attendance is mandatory. You must attend your scheduled lab. You may only utilize data obtained during labs in which you have personally participated. Exceptions to this policy will be considered on an individual basis and requires that you submit a written (EMail) request to the instructor. In the case of unforeseen emergencies, a written request/explanation must be made as soon as possible. Due to the project-based nature of this course you will not be able to make up missed labs but will be held responsible for all material.

Prelab Preparation

Prior to each week's discussion, you should read the pre-assigned literature related to the week's lab.

Written Assignments

This is a W course and the emphasis in this course is to learn to prepare a scientific document that in the style of a NIH or NSF grant.

Deadlines and Late Penalties

All deadlines are strictly enforced! Deadlines are specified on the assignment cover sheet. Unless you are instructed otherwise, a hard-copy of each assignment should be handed in at the beginning (within the first 10 minutes) of the indicated laboratory period. The electronic submission of each assignment must be submitted on-line by the same deadline. Assignments received after their deadlines will receive a late penalty.

Late assignments will be penalized 10 points per day. (Over weekends and holidays each day counts separately towards your penalty.)

Extensions, penalty exemptions or lab makeups

The course policies are *very* strict, however we recognize that there can be circumstances warranting special consideration. All requests for special consideration must be submitted to Dr. Kanadia by Email. Your TA does NOT have the authority to waive assignment deadlines or penalties.

Extensions of deadlines will only be considered in cases of documented emergencies. Extensions will not be granted due to bad planning. (Failure to submit an assignment because of a crashed

computer or a broken printer is a case of bad planning and indicates that you left things to the last minute.) If you know that you will not be around to hand in an assignment you should hand it in EARLY.

In general, you will NOT be able to make up missed labs. But if you know that you will miss a lab you must notify the TA as soon as possible. If your absence is approved you will be allowed to complete the written assignment using data obtained from your partner. An example of a *valid* reason to miss a lab is a conflict because of an interview for medical school since you have minimal control over the scheduling. An example of an *invalid* excuse is that you want time to study for an exam in another course.

Since exercises are done with a lab partner please recognize that absences may be a hardship to your assigned lab partner since he/she will have to perform the exercise without your assistance.

Lab Groups/Partners

For the first few laboratory exercises the TAs will assign lab partners. You must work with your assigned partner(s). In part, this policy allows us to shift students around so that each student learns the necessary laboratory skills and can contribute to the exercises. You will be able to select your own partner(s) for carrying out the independent project, subject to your TAs approval.

Sharing of Data

Laboratory partners perform the lab exercises as a together, however partners must maintain separate lab notebooks. Data obtained during the experiments are the *shared property of the participating lab partners*. However, individuals *must actively participate in the laboratory exercises* to be eligible to use the team's data.

Lab partners may share tables, spreadsheet data, spreadsheet analyses, and graphs, if they so desire. For example, one student can make the final graphs and email to the other student for inclusion in his/her lab report. Although data, spreadsheets and graphs may be shared, the textual parts of your lab reports must be your own work, and written in your own words. Material derived from other sources must clearly identified and the sources must be cited appropriately.

Lab groups may make their data available to other groups (for use in comparisons or other approved uses) provided 1) all members of the group agree to share the data, and 2) groups using the data identify the shared data and cite the source.

Plagiarism & Cheating

Please be sure that you read and understand the meaning of plagiarism and cheating.

In simplest terms, *cheating* is fabrication of work or the misrepresentation of your role in fulfilling assignments and/or demonstrating mastery of the material. Cheating will not be tolerated. If you cheat you will receive an F in the course.

Plagiarism, in simple terms, is the misrepresentation of someone else's work as your own. In science we are always building upon a foundation of knowledge based on the work of others, and it is appropriate to discuss, refer to, and even quote from their work. In such cases it is of paramount importance to cite the source of the information appropriately. During the course we will discuss how you should cite material that you use in your report. (There is an optional on-line module on HuskyCT that deals with plagiarism. If you have not seen this module we recommend that you try it out.)

Plagiarism detection software. HuskyCT provides instructors with plagiarism-detection tools. We may utilize these tools to screen student submissions. For specific assignments we may make this software available for your use so that you can screen your assignment yourself before it is submitted for grading.

Plagiarism is a serious offense and will result in failure of an assignment and possibly an F in the course. The *Student Code of Conduct* explains the procedures that will be followed for cases of cheating and/or plagiarism.

Lab Notebooks

Each student must maintain a laboratory notebook dedicated to serving as a permanent record of your experiments. Your lab notebook must have non-removable pages (i.e., a spiral notebook or ring binder is NOT acceptable). A 1/4" grid chemistry-style lab notebook with permanent white pages and removable yellow pages is convenient, and required; the yellow copy can be given to your lab partner so that you both have copies of all data. Loose sheets (computer printouts or the 'yellow sheets' from your partner)

must be glued or taped into your notebook to become part of the permanent record of your experiment.

Your Notebook is the formal record of your experimental procedures and results. It should be a 'running log' of your experiment from the initial thought process and experimental design, through data collection, and finally including analysis. All original data must be recorded in your lab notebook. *Do not use scraps of paper to record data* with the expectation that you will re-enter the data more neatly at a later time. Enter data in real time. If you need to make a correction, make a clear change and annotate the reason for the change, if the reason is not apparent. It is not obvious now, but the entry of *everything* will make it easier to put your data together accurately for your reports.

We will not explicitly grade your notebook, but you must show your notebook to your instructor or TA upon request at any time during the lab. You must also be prepared to show your notebook to support results presented in your assignments. Your commitment to recording things accurately, timely, and appropriately, will be reflected in each assignment's grade.

Course Grade

Each assignment will be graded on a scale of 0-100 but weighted proportional to its complexity. The weight will be indicated on each assignment cover sheet. (In general, early assignments are weighted less than later assignments.) The grade for each assignment will include a subjective component, awarded by the TA that reflects your performance during that specific lab exercise. As a *rough* guide to understanding the numerical grade: 90% is in the range of A–, 85% ~ B, 75% ~ C, <65% ~ F.

Grading policy.

In regard to grades, the final proposal will be 75% of the grade and the weekly revised reports will account for the remaining 25%. The result, divided by the maximum possible number of points, is a final numerical grade between 0 and 100%.

Grading Disputes

As a course policy, TAs are specifically prohibited from regrading any assignments. If you feel that you have a valid reason for having your grade reviewed *you must submit a written request that includes your explanation, including any supporting information*. The TA will then discuss the issue with the instructor and they will determine whether a grade change is justified. (This procedure does not need to be followed to correct bookkeeping errors such as math errors.)

(This syllabus is in part exactly like the syllabus prepared by Dr. Andrew Moiseff for his PNB-3263WQ course and has been done so with his permission.)