

FLORIDA ATLANTIC UNIVERSITY™

Graduate Programs—NEW COURSE PROPOSAL¹

UGPC APPROVAL _____
 UFS APPROVAL _____
 SCNS SUBMITTAL _____
 CONFIRMED _____
 BANNER POSTED _____
 CATALOG _____

DEPARTMENT: BIOMEDICAL SCIENCE

COLLEGE: CHARLES E. SCHMIDT COLLEGE OF MEDICINE

RECOMMENDED COURSE IDENTIFICATION:

PREFIX PCB COURSE NUMBER 6665 LAB CODE (L or C) No Lab

(TO OBTAIN A COURSE NUMBER, CONTACT [MJENNING@FAU.EDU](mailto:mjennin@fau.edu))

COMPLETE COURSE TITLE: HUMAN GENETICS

EFFECTIVE DATE

(first term course will be offered)

SPRING 2015

CREDITS: 3

TEXTBOOK INFORMATION: Thompson & Thompson Genetics in Medicine, 7th Edition

Authors: By Robert L. Nussbaum, MD, Roderick R. McInnes, MD, PhD, FRS(C) and Huntington F. Willard, PhD

GRADING (SELECT ONLY ONE GRADING OPTION): REGULAR SATISFACTORY/UNSATISFACTORY _____

COURSE DESCRIPTION, NO MORE THAN THREE LINES: Human Genetics is a course designed to provide students with a functional understanding of the field of human genetics as it applies to progressive research and medicine. The course will emphasize the integrated understanding and application of Genetic Analysis, Diagnosis and Mechanisms in human disease.

PREREQUISITES *: NONE

COREQUISITES*: NONE

REGISTRATION CONTROLS (MAJOR, COLLEGE, LEVEL)*:

INSTRUCTOR PERMISSION REQUIRED

* PREREQUISITES, COREQUISITES AND REGISTRATION CONTROLS WILL BE ENFORCED FOR ALL COURSE SECTIONS.

MINIMUM QUALIFICATIONS NEEDED TO TEACH THIS COURSE: BIOMEDICAL OR COM FACULTY

Faculty contact, email and complete phone number:

Dr. Marc Kantorow
mkantoro@fau.edu
 (561) 297- 2910

Please consult and list departments that might be affected by the new course and attach comments.

Charles E. Schmidt College of Science (see attached letter)

Approved by:

Department Chair: _____

College Curriculum Chair: _____

College Dean: _____

UGPC Chair: _____

Graduate College Dean: _____

UFS President: _____

Provost: _____

Date:

9/22/14

9/22/14

9/23/14

10/8/14

10-15-14

1. **Syllabus** must be attached; see guidelines for requirements:
www.fau.edu/provost/files/course_syllabus.2011.pdf

2. Review **Provost Memorandum: Definition of a Credit Hour**
www.fau.edu/provost/files/Definition_Credit_Hour_Memo_2012.pdf

3. **Consent** from affected departments (attach if necessary)

Email this form and syllabus to UGPC@fau.edu **one week before** the University Graduate Programs Committee meeting so that materials may be viewed on the UGPC website prior to the meeting.

Human Genetics- Spring 2015

Course # PCB (TBD) – 3 credits
Course Requisites: Instructor Permission
Instructors: Marc Kantorow, Ph.D.
Course hour: MW 4-5:20 (To be confirmed)
Place: TBD
Office hour & place: Office 207 Lab 212
561.297.2910 office/ 561.297.2918 lab
Email: mkantorow@fau.edu
Office hours- Friday 2-4:30 or by appointment

Text: Thompson & Thompson Genetics in Medicine, 7th Edition

Authors: By Robert L. Nussbaum, MD, Roderick R. McInnes, MD, PhD, FRS(C) and Huntington F. Willard, PhD

Course Description:

Human Genetics is a course designed to provide students with a functional understanding of the field of human genetics as it applies to progressive research and medicine. The course will emphasize the integrated understanding and application of Genetic Analysis, Diagnosis and Mechanisms in human disease. Students will be evaluated based on their cumulative performance on one mid-term and one final exam. Exams will be cumulative. Attendance is not mandatory but students are responsible for knowing all information presented during lecture. The instructor reserves the right to alter the schedule or content of the course at anytime. This course will be taught using case-based models for genetic analysis, diagnosis, mechanisms and how they contribute to human disease phenotypes. These models have been chosen for their applicability to illustrate and apply important genetic concepts. Where applicable therapies and treatment options will be discussed. Students will be expected to learn course material independently outside of class since this is case-directed graduate-level course. This self-directed learning will include but not be limited to reading assignments given out bi-weekly during lectures. The majority of these assignments will come from Thompson and Thompson, GENETICS IN MEDICINE, 7th Edition.

Course Objectives: This course will emphasize mechanistic principles of human genetics and disease. These include but are not limited to: pedigree construction and analysis, linkage mapping, modes of inheritance, gene function analysis, genotype-phenotype correlations, disease mechanisms, epigenetic regulation, genetics of sex, signal transduction, cell-transport, DNA replication and repair, genetic mechanisms of immune tolerance, genetics of metabolism, gene expression control, mitochondrial regulation and disease, epidemiology, genetic association,

mosaic gene expression, genetic recombination inheritance, advances in genetic technologies, population inheritance and gene frequency and many more!

Course Schedule:

January 2015

Monday 5th: Intro to the course and Achondroplasia

Wednesday 7th: Alzheimer Disease

Monday 12th: Hereditary Breast and Ovarian Cancer

Wednesday 14th: Chronic Myelogenous Leukemia

Monday 19th: No School- M.L. King Jr. Holiday

Wednesday 20th: Duchenne Muscular Dystrophy

Monday 26th: Familial Hypercholesterolemia

Wednesday 28th: Glucose-6-Phosphate Dehydrogenase Deficiency

February 2015

Monday 2nd: Hereditary Nonpolyposis Colon Cancer

Wednesday 4th: Holoprocencephaly

Monday 9th: Huntington Disease

Wednesday 11th: Insulin-dependent Diabetes Mellitus

February 16-20: EXAM 1- Midterm

Monday 23rd: Marfan Syndrome

Wednesday 25th: Miller-Dieker Syndrome

March 2015

Monday 2nd: SPRING BREAK

Wednesday 4th: SPRING BREAK

Monday 9th: Myoclonic Epilepsy

Wednesday 11th: Non-Syndromic Deafness

Monday 16th: Polycystic Kidney Disease

Wednesday 18th: Prader-Willi Syndrome

Monday 23rd: Retinoblastoma

Wednesday 25th: Sex Reversal

Monday 30th: Cystic fibrosis

April 2015

Wednesday 1st: Tay-Sachs Disease

Monday 6th: Xeroderma Pigmentosum

Wednesday 8th: Rett Syndrome

Monday 13th: Fragile X Syndrome

Wednesday 15th: Exam Preparation Day

Monday 20th: In Class Review

Wednesday 22nd: In Class Review??

March 23-29: FINAL EXAM

Course Policies: Makeup tests and late work are not allowed unless an approved physical problem or schedule conflicting with University-approved activities

Classroom etiquette: Please refer to the FAU Catalog and Student Handbook. Compliance with university rules and regulations is expected of all students.

Academic Honor Code: Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards because it interferes with the University mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the University community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility.

The FAU Honor Code requires a faculty member, student, or staff member to notify an instructor when there is reason to believe an academic irregularity is occurring in a course. The instructor must pursue any reasonable allegation, taking action where appropriate. The following constitute academic irregularities:

1. The use of notes, books or assistance from or to other students while taking an examination or working on other assignments, unless specifically authorized by the instructor, are defined as acts of cheating.
2. The presentation of words or ideas from any other source as one's own is an act defined as plagiarism.
3. Other activities that interfere with the educational mission of the University.

For full details of the FAU Honor Code, see University Regulation 4.001 at www.fau.edu/regulations/chapter4/4.001_Honor_Code.pdf.

Students With Disabilities: In compliance with the American Disabilities Act (ADA), students who require special accommodations due to a disability to properly execute coursework must register with the Office for Students with Disabilities (OSD) – in Boca Raton, SU 133 (561-297-3880); in Davie, MOD 1 (954-236-1222); in Jupiter, SR 117 (561-799-8585); or at the Treasure Coast, CO 128 (772-873-3305) – and follow all OSD procedures.

Human Genetics: Marc Kantorow Ph.D.

Human Genetics is a new required core course for the MS in Biomedical Science curriculum of the Schmidt College of Medicine. It is not related to the Biology Departments genetics courses (PCB 4522 or PCB 3063) since these are general introductory genetics courses that do not specifically focus on human diseases and not appropriate for our programmatic requirements. The COM Human Genetics Course has completely different learning objectives than other genetics courses in biology or at FAU since it focuses on understanding the epidemiology, etiology, disease mechanisms and potential therapies for specific human genetic diseases. The instructor is uniquely qualified to teach this course having a Ph.D. specifically in genetics and a long track record of NIH funded research and published scholarship specific for human genetic disease mechanisms. It is important to the COM that the core courses required for our program are taught in-house to optimize the goals, content and academic outcomes required by our own program. Thanks in advance for your help getting this course evaluated and listed on time.

Subject: RE: Biology Department Feedback on COM New Course Proposals-WE NEED A LETTER
Date: Monday, September 29, 2014 at 4:08:21 PM Eastern Daylight Time
From: William Brooks
To: Carolina Clark
CC: John Newcomer, David Bjorkman, Russell Ivy, Michelle Cavallo, Marc Kantorow, Rodney Murphey, Kenneth Dawson Scully, David Binninger, Colin Hughes, Dale Gawlik, Andrew Oleinikov

Great! We look forward to helping move all of these courses towards approval! Again, for the record, the sentiment was to approve the Advanced Molecular and Cell Biology but clarifications to distinguish this course from our undergraduate course should be articulated.

Randy

W. Randy Brooks, PhD

Professor of Biology
Chair, FAU Biology Undergraduate & MS Graduate Program Committees
Boca Raton, FL 33431, Phone: 561-297-3888, Email: wbrooks@fau.edu

<http://www.science.fau.edu/biology/faculty/wbrooks.html>

<http://www.science.fau.edu/biology/masters/masters.html>

<http://www.science.fau.edu/biology/masters/masters-faq.html>

From: Carolina Clark
Sent: Monday, September 29, 2014 3:39 PM
To: William Brooks
Cc: John Newcomer; David Bjorkman; Russell Ivy; Michelle Cavallo; Marc Kantorow; Rodney Murphey; Kenneth Dawson Scully; David Binninger; Colin Hughes; Dale Gawlik; Carolina Clark; Marc Kantorow; Andrew Oleinikov
Subject: Re: Biology Department Feedback on COM New Course Proposals-WE NEED A LETTER

Dear Randy,

Thanks so much for your help and quick turn around time. We will go ahead and submit all 4 courses to the UGPC noting the concerns about Advanced Mol and Cel Biology course. We will also contact the instructor Dr. Oleinikov to obtain additional information distinguishing this course from the undergraduate molecular biology course that we will forward you as soon as we receive it.

Thank you again for your help and consideration.

Sincerely,

Marc.

From: William Brooks <wbrooks@fau.edu>

Date: Monday, September 29, 2014 at 2:59 PM

To: Marc Kantorow <mkantoro@fau.edu>

Cc: John Newcomer <jnewcomer@fau.edu>, David Bjorkman <dbjorkm1@health.fau.edu>, Russell Ivy <IVY@fau.edu>, Michelle Cavallo <MCAVALLO@fau.edu>, Marc Kantorow <mkantoro@fau.edu>, Carolina Clark <clarkc@fau.edu>, Rodney Murphey <RMURPHEY@fau.edu>, Kenneth Dawson Scully <kdawsons@fau.edu>, David Binninger <binninge@fau.edu>, Colin Hughes <Chughe@fau.edu>, Dale Gawlik <dgawlik@fau.edu>, William Brooks <wbrooks@fau.edu>

Subject: RE: Biology Department Feedback on COM New Course Proposals-WE NEED A LETTER

Hi Marc,

I thought it best if I communicate with you directly. First, Biology appreciates your quick turn-around on the new course proposals we sent your college. We, similarly, have tried to solicit our faculty to reply quickly. We received completed new course proposals from Biomed on Wednesday of last week and immediately sent them out to all potentially interested faculty. Although we did not get some responses (thus, the "no response" notation on the comments list), some comments requiring a response were made for the Advanced Molecular and Cellular Biology course - the remaining courses were fine (i.e., approved) as submitted.

We were asked by your program to reply quickly so that an Oct. 1st deadline of submitting your new courses to the University Programs Committee (UPC) could be met. So, again, we did our best in getting responses. I believe the questions raised can be addressed by the Biomed faculty who plan on teaching Advanced Molecular and Cellular Biology. However, I'm not sure if this can be done with only 48 hours left with your deadline. You "might" be able to go ahead and submit all of the courses to the UPC with the proviso that

additional comments may come in afterwards (again, I am not sure about this). In any case, the UPC will want these concerns brought up by some of our faculty to be clarified before they can be approved. We certainly know this can be inconvenient as one of the courses we recently sent your program was flagged by another college. Before we can move forward on that course, we will need to address their concerns. So please forward responses to our specific comments about Advanced Molecular and Cellular Biology to us (mcavallo@fau.edu & wbrooks@fau.edu). We will then immediately make sure the responses get to our faculty who raised the questions, and in turn ask for an immediate response back from them.

Clearly the system of course approvals has its requirements that are at times tedious. But we certainly want to help your program moving forward as you have done for us.

Cheers,
Randy Brooks

Professor of Biology
Chair, FAU Biology Undergraduate & MS Graduate Program Committees
Boca Raton, FL 33431, Phone: 561-297-3888, Email: wbrooks@fau.edu

<http://www.science.fau.edu/biology/faculty/wbrooks.html>

<http://www.science.fau.edu/biology/masters/masters.html>

<http://www.science.fau.edu/biology/masters/masters-fms.html>

From: Carolina Clark
Sent: Monday, September 29, 2014 2:12 PM
To: William Brooks
Cc: John Newcomer; David Bjorkman; Russell Ivy; Michelle Cavallo; Marc Kantorow; Rodney Murphey
Subject: Re: Biology Department Feedback on COM New Course Proposals-WE NEED A LETTER

Dear Dr. Brooks,

Dr. Kantorow would really appreciate getting your response on the issues below.

Thanking you in advance for your assistance.

Carolina

From: Rodney Murphey <RMURPHEY@fau.edu>
Date: Monday, September 29, 2014 at 1:50 PM
To: Marc Kantorow <mkantoro@fau.edu>, Michelle Cavallo <MCAVALLO@fau.edu>
Cc: Carolina Clark <clarkc@fau.edu>, John Newcomer <jnewcomer@fau.edu>, David Bjorkman <dbjorkm1@health.fau.edu>, Russell Ivy <IVY@fau.edu>, William Brooks <wbrooks@fau.edu>
Subject: Re: Biology Department Feedback on COM New Course Proposals-WE NEED A LETTER

Marc,
Please contact Dr Brooks Professor of Biology the Graduate Program Committee Chair. He handles these issues for Biology.
Cheers,
Rod

From: Marc Kantorow <mkantoro@fau.edu>
Date: Monday, September 29, 2014 1:23 PM
To: Michelle Cavallo <MCAVALLO@fau.edu>
Cc: Carolina Clark <clarkc@fau.edu>, John Newcomer <jnewcomer@fau.edu>, David Bjorkman <dbjorkm1@health.fau.edu>, rmurphey <rmurphey@fau.edu>, Russell Ivy <IVY@fau.edu>
Subject: Re: Biology Department Feedback on COM New Course Proposals-WE NEED A LETTER

Michelle-Thanks for the individual faculty votes. Does this constitute course approval? Could we get a letter from Dr. Brooks approving the courses as we provided for your courses? I think that is what the university graduate program committee needs.
Thanks,
Marc

Marc Kantorow, Ph.D.
Professor and Director of Graduate Programs
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777 Glades Rd. BC71 RM202
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Boca Raton, FL 33431
561-297-2910 (office)
561-297-3806 (lab)
mkantoro@fau.edu

From: Michelle Cavallo <MCAVALLO@fau.edu>
Date: Monday, September 29, 2014 at 1:15 PM
To: Keith Brew <KBREW@fau.edu>
Cc: William Brooks <wbrooks@fau.edu>, Rodney Murphey <RMURPHEY@fau.edu>, marc kantorow <mkantoro@fau.edu>, John Newcomer <jnewcomer@fau.edu>, David Bjorkman <dbjorkm1@health.fau.edu>, John Baldwin <jbaldwin@fau.edu>, Colin Hughes <Chughe@fau.edu>, David Binninger <binninge@fau.edu>, Xing-hai Zhang <xhzhang@fau.edu>, Kailiang Jia <kjia@fau.edu>, John Nambu <jnambu@fau.edu>, Timothy Theisen <TTHEISEN@fau.edu>, Diane Baronas-Lowell <dlowell@fau.edu>, Tanja Godenschwege <godensch@fau.edu>, Gregory Macleod <macleodg@fau.edu>, "M.J. Saunders" <misaund11@fau.edu>, "ken.dawson-scully@fau.edu" <ken.dawson-scully@fau.edu>, Brenda Claiborne <bclaibor@fau.edu>, James Kumi-Diaka <jdiaka@fau.edu>, James Hartmann <jhartman@fau.edu>

Subject: Biology Department Feedback on COM New Course Proposals

Dear Dr. Brew,

Thank you for sending College of Medicine's new course proposals for review by the Biology Department. Please see the below itemized feedback provided by our faculty who teach related courses.

Sincerely,

Randy Brooks,
Professor and Biology Graduate Program Committee Chair

1. Human Genetics

a. Sent to:

- i. **John Baldwin** – no response
- ii. **Colin Hughes** – no response
- iii. **David Binninger** – While a few topics overlap with courses in our department, it is not sufficient to recommend that the *Human Genetics* course not be submitted. This is especially true because the proposed course is a graduate level course. I think it will be an excellent course for a number of our graduate students. Please let me know if you have questions or need a more detailed explanation.
- iv. **Xing-hai Zhang** – response: Regarding college of medicine's new courses, I don't see any conflict for "Human genetics", which focuses on human diseases.
- v. **Kailiang Jia** – no response
- vi. **John Nambu** – no response
- vii. **Timothy Theisen** – no response
- viii. **Diane Baronas-Lowell** – response: Please give my vote to whatever David votes.
- ix. **Tanja Godenschwege** – no response
- x. **Gregory Macleod** – no response

2. Advanced Molecular and Cellular Biology

a. Sent to:

- i. **John Baldwin** – no response
- ii. **Colin Hughes** – no response
- iii. **David Binninger** – no response
- iv. **Xing-hai Zhang** - response: Regarding college of medicine's new courses, I don't see any conflict for "Human genetics", which focuses on human diseases. But for "Advanced Mol, Cell Biology", its content is very similar to what we teach in "Genetics" and will be even more similar to our proposed "Molecular Genetics" (per Colin Hugues). It would be OK if we don't offer graduate level Genetics, Molecular Genetics or Mol Cell Biology courses, only undergrad courses.
- v. **Kailiang Jia** – no response
- vi. **John Nambu** – no response
- vii. **Timothy Theisen** – response: I have reviewed that attached document describing the proposed new course, Advanced Cellular and Molecular Biology, and have the following comments: 1) Their proposed course as described will be different than our undergraduate Molec and Cell course in that it will focus on human physiology, human disease, and potential therapies, topics which are not covered in the undergraduate biology course. 2) Their characterization of our undergraduate Molec and Cell course as a "general introductory course" is inaccurate. We also focus on understanding the physical-chemical basis of biological processes and cell function and the role of evolutionary processes in

Over the Spring

The faculty for existing College of Medicine's new course proposal for review for the Biology Department. Please see the below letterhead provided by our faculty who teach related courses.

Respectfully,

Professor and Biology Graduate Program Coordinator, David

3. Human Genetics

sent for

- i. John Higgins - no response
- ii. John Higgins - no response
- iii. David Higgins - While a few faculty members with courses in our department if I am confident in recommending the Human Genetics course not be submitted. This especially the process of course approval is a graduate level course. I think it will be an excellent course for a number of our graduate students. Please let me know if you have questions or need a more detailed explanation.
- iv. Ming-Jai Sheng - my main regarding college of medicine's new courses I don't see any conflict for "Human Genetics", which focuses on human diseases.
- v. Kimberly He - no response
- vi. John Higgins - no response
- vii. Kimberly Higgins - no response
- viii. David Higgins - I'd like to give my vote to whatever David votes
- ix. Ming-Jai Sheng - no response
- x. Gregory Johnston - no response

3. Advanced Molecular and Cellular Biology

sent for

- i. John Higgins - no response
- ii. John Higgins - no response
- iii. David Higgins - no response
- iv. Ming-Jai Sheng - regarding college of medicine's new courses I don't see any conflict for "Human Genetics", which focuses on human diseases, but for "Advanced Molecular and Cellular Biology", in contrast to what we teach in "Genetics" and will be even more similar to our existing "Molecular Genetics" (see Colin Higgins), it would be OK if we don't recommend a level beyond a level beyond courses.
- v. Kimberly He - no response
- vi. John Higgins - no response
- vii. Kimberly Higgins - no response
- viii. David Higgins - I have reviewed the proposal and I recommend describing the proposed new course "Advanced Molecular and Cellular Biology" as follows: The following comments: (1) This proposed course will be different than our existing courses in that it will focus on advanced molecular biology, human genetics, and general principles, which will be different from the existing molecular biology courses. (2) Their characterization of the proposed course as a "graduate introductory course" makes me think of recommending the physical and molecular basis of biological processes and the molecular and cellular processes in

shaping these interactions. However, we only barely relate these to human pathology or potential therapies. 3) We only barely discuss cancers and do not cover immunology at all, so these are clear points of difference. 4) I am a little curious as to why the syllabus does not reflect these different topics; as it currently reads it is pretty much identical to the undergrad Molec and Cell course, except for the time devoted to student presentations. In conclusion, because the course is designed to cover Molec and Cell with an emphasis on its role in human physiology and disease and possible therapies, I feel that it is sufficiently different than the course currently offered by the biology department. If it is, in fact meant to be an advanced course then I would think an undergraduate Molec and Cell course (taken at FAU or wherever their undergrad degree was earned) would be a mandatory pre-req, not merely a suggestion. Otherwise the course will end up spending a lot of time on review.

- viii. **Diane Baronas-Lowell** – no response
- ix. **Tanja Godenschwege** – response: Not only significantly but totally, with mine and Tim Theissens MCB course as we even use the same textbook. However ours is for undergraduates but theirs is supposed to be for graduates ? Not sure if that makes any difference??
- x. **Gregory Macleod** – response: Seems like their Cell Bio course would overlap significantly with your existing Mol Cell Bio course
- xi. **M.J. Saunders** – no response

3. Neurobiology of Addiction

- a. Sent to:
 - i. **Rodney Murphey**
 - ii. **Tanja Godenschwege** – no response
 - iii. **Ken Dawson-Scully** - I don't have an issues with the proposed course Neurobiology of Addiction. On the contrary I think it will be an excellent addition to the Neuroscience curriculum at FAU.
 - iv. **Brenda Claiborne** – This course looks fine to me.

4. Immunology Seminar

- a. **James Kumi-Diaka** – response: I have just reviewed the College of Medicine's new course proposal in immunology. This course is technically an Immunology Seminar Course at the 5000 level. One would expect a prerequisite for this Seminar; but that is up to the College of Medicine I do not see any conflict with our immunology course – PCB 4233; which is a full upper level course. I suggest they may go ahead and offer the seminar: MY OPINION
- b. **James Hartmann** – response: The biomed seminar in Immunology appears to be different from any Immunology course offerings in biology. I believe this is a formal course to replace the informal seminar series that I have attended in the past.

Michelle Cavallo
Administrative Assistant & Graduate Coordinator
Department of Biological Sciences
Florida Atlantic University
777 Glades Road
Boca Raton, FL 33431
PH: 561-297-0384

shipping these materials. However, we only have the materials listed in human panel 10 in
 potential materials. (3) We only have a few materials and do not have immunology materials
 on these materials (difficulties) - I have a little experience as to why the materials does
 not reflect these difficulties; as it currently seems it is pretty much limited to the
 integrated lecture and lab course. I would like to see the materials for the integrated
 course designed to cover the lab and lab with an emphasis on
 the role in human physiology and disease and present material. I feel that it is especially
 different than the course currently offered by the department. It is in fact more
 to be an integrated course than I would think an integrated lab and lab course
 (taken in MA) or otherwise. I would think that the integrated lab and lab course
 would not have a suggestion. I think that the materials will end up including a lot of time on

review

- vii - Human Physiology - no response
- ix - Human Physiology - no response
- x - Human Physiology - no response
- xi - Human Physiology - no response
- xii - Human Physiology - no response

5. Immunology or Microbiology

- i - Immunology - no response
- ii - Immunology - no response
- iii - Immunology - no response
- iv - Immunology - no response

6. Immunology or Microbiology

- a. Immunology - no response
- b. Immunology - no response

Michele Cavalli
 Administrative Assistant & Graduate Coordinator
 Department of Biological Sciences
 Florida Atlantic University
 777 Galt Ocean Road
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 PH: 561-365-0384