Graduate Council Curriculum Committee
September 21, 2016
2:30 p.m., Millican Hall 395E

Agenda

1. Welcome and call to order
2. General business
    - Introductions
    - Graduate Council Curriculum Committee overview
    - Proxy voting
3. Addition of 3 tracks in the COM Biomedical Sciences MS program
    - Cancer Biology track
    - Infectious Disease track
    - Metabolic and Cardiovascular Science track
4. Addition of COM BSBS split level course: ZOO 4605/5XXX Clinical Embryology and Congenital Malformations
5. Revisions to the CECS Computer Forensics Certificate
6. Revisions to the CECS Computer Science MS, Accelerated BS to MS track
7. Revisions to the CGS Modeling and Simulation MS program
8. Revisions to the CGS Modeling and Simulation PhD program
9. Revisions to the CGS Nanotechnology MS program
10. Suspension of the CGS Conservation Biology PSM program
11. Courses and special topics
12. Adjournment

Members of the Graduate Council Curriculum Committee

Kerry Purmensky, Chair, CAH
Charles Kelliher, CBA
Jim Moharam, Steering Liaison, COP
Elsie Olan, CEHP
Jennifer Sandoval, COS
Asli Tasci, RCHM
Art Weeks, CECS
Diane Andrews, CON
Steven Ebert, COM
Shuo “Sean” Pang, COP
Terrie Sypolt, LIB
Joshua Troche, COHPA
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UNIVERSITY OF CENTRAL FLORIDA
COLLEGE OF GRADUATE STUDIES

NEW FORM – BEGINNING FALL 2015

Program Recommendation Form - ADDITIONS ONLY

This form is to be used to **ADD** degree programs, tracks, or certificate programs. If there are tracks being added to the program, one form may be used for both the program and the track(s).

Please refer to the Graduate Council Curriculum Meeting Schedule for submission deadlines.

Checklist of items to be attached with completed form:

☑ Complete and current Graduate Catalog copy (www.graduatecatalog.ucf.edu), including description, curriculum, contact information, application requirements, and application deadlines.

☐ A list of faculty who will participate in the program, track or certificate and their credentials.

☐ If applicable, a written agreement from all involved units that they are in support of, will provide courses to, or will participate in the program, track, or certificate.

☐ Course Action Request forms, as needed.

☑ Library assessment of resources.

College/Unit(s) Submitting Proposal: COM—BSBS

Proposed Effective Term/Year: Immediately

Unit(s) Housing Program: Burnett School of Biomedical Sciences

Name of program, track and/or certificate: Cancer Biology Track in MS Biomedical Sciences

Please check all that apply: This action affects a: ☐ Program ☑ Track ☐ Certificate

DELIVERY: Program will be delivered: ☑ Face to Face ☐ Completely Online ☐ Mixed Delivery

Will the program be a **market tuition rate** program? ☐ Yes ☑ No

Brief description of program and rationale for the addition: **Do not add complete catalog copy here.**

Cancer Biology Track is a non-thesis option in MS Biomedical Sciences which will attract, educate and train graduate students in the area Cancer Biology. Graduates in this program may pursue doctoral training or pursue professional education focused on Medicine, Physiology, and Cancer.

Impact on Current Students

Will students be moved from an existing program, track, or certificate into this new program, track, or certificate? ☐ Yes ☑ No

If yes, state the name of the program or track where students are currently enrolled and attach a list of students if possible:

Students enrolled in MS Biomedical Sciences may choose to select Cancer Biology Track.

Will students have the option to stay in their existing program, track, or certificate? ☑ Yes ☐ No

If yes, how will current students be impacted by the addition of a program, track or certificate?

Current enrolled students in MS Biomedical Sciences will be given an opportunity to select Cancer Biology Track, if interested. The main goal of the new track is to increase regional/national/international enrollment in the Burnett School of Biomedical Sciences Graduate Program and the College of Graduate Studies.

Future Students

Provide a statement of who is likely to enroll and why. Please state if there is licensure or certification that depends upon this education, etc. Also, complete the following table.

-Students with ambition to pursue a career in Cancer Research.
-Students with ambition to pursue doctoral/Medical/other professional education and in need of additional academic credentials.
-Others seeking professional development in clinical and health careers related to cancer patients.

	Year 1	Year 2	Year 3
Headcount	10	25 (15 1st yr + 10 2nd yr)	35 (20 1st yr + 15 2nd yr)
SCHs	240 (24 hrs for 1st yr)	450 (9 hrs for 2nd yr + 24 hrs for 1st yr)	615 (9 hrs for 2nd yr + 24 hrs for 1st yr)

Indicate likely career or student outcomes upon completion: (What will students do? What will their job titles be?)

Pursue professional education (MD, PHD, DOD...)
Pursue career in Medicine, Physiology, Cancer Biology, or other health/clinical professions.

Please complete the following table on financial support: (Specify all forms of support – assistantships, fellowships, and tuition remission.)

	Number of assistantship students	Source of funds	Number of fellowship students (specify fellowship)	Number of tuition remissions	Source of funds
Year 1	No		No	No	
Year 2	No		No	No	
Year 3	No		No	No	

Signature Page

Recommend Approval (all approval levels must be signed)

Department Chair /Director	(Print) Griffith Parks	(Signature)		Date	8-2-16
College Academic Standards	(Print) Saleh Naser	(Signature)		Date	8-2-16
College Dean	(Print) Richard Peppler	(Signature)		Date	8-3-16
Graduate Council	(Print)	(Signature)		Date	
Graduate Dean	(Print)	(Signature)		Date	

Approval

Provost and Executive Vice President: _____ **Date** _____

Distribution: After approval is received from the Provost, distribution will be to:

Department(s); College; Registrar; Associate Registrar; Institutional Knowledge Management; Academic Services; College of Graduate Studies

Proposal

Cancer Biology (CB)
Non-thesis track in MS Biomedical Sciences

Burnett School of Biomedical Sciences College of Medicine

Dean: Deborah German
Director: Griffith Parks
Coordinator: Saleh Naser

407-823-0955
Saleh.naser@ucf.edu

Non-thesis Cancer Biology track
In MS Biomedical Sciences
Burnett School of Biomedical Sciences; College of Medicine

With new leadership in the Burnett School of Biomedical Sciences (BSBS), a clear roadmap has been developed to advance the academic and research missions of the School, with the goal of becoming a Tier 1academic/research Institution. The new Director's roadmap for the School includes an emphasis on developing cohesive science-based units that have a shared identity. A cornerstone of this plan involves establishing divisions within BSBS, including Neuroscience, Cancer Biology, Infectious disease, and Metabolic and Cardiovascular Sciences. Academic tracks at the MS and PhD level will play an essential role in this plan, since training and educating graduate students in these focused scientific areas will be drivers in the identity, growth, interactions, and sustainability of each of the departments.

MS Biomedical Sciences:
is a non-thesis broadly based graduate program that enables focused education in defined tracks to execute the BSBS Director's plan.

We plan to develop non-thesis tracks in each of BSBS divisions as follow:

1. Non-thesis MS Neuroscience track: approved in Fall 2015
Inauguration class: 30 applications received for Fall 2016, 16 students admitted.

2. Non-thesis MS METABOLIC and CARDIOVASCULAR SCIENCES track: proposal under review (submitted separately)

3. Non-thesis MS Infectious Disease track: proposal under review (submitted separately)

4. Non-thesis MS Cancer Biology track:
The new tracks in the MS Biomedical Sciences Program will:

1. provide significant visibility and marketing of COM graduate programs and ultimately recruitment of more quality national/international students.
2. retain many of the UCF students who are seeking professional education following undergraduate graduation.
3. be self-sustained and will not require development of new courses or recruitment of new instructors.
4 solidify and strengthen partnerships with other UCF units including College of Sciences, Computer Sciences, COHPA and others.
5. form the core from which potential Training Grants and Fellowship Programs can emerge.
6. become a pipeline to the interdisciplinary Biomedical PhD program which should increase the pool of applications and raise the quality of our students.

The MS Biomedical Sciences track in Cancer Biology (CB) will focus on educating and training students on the basic biology of cancer and human disease, with an emphasis on learning the technologies that will advance development of new targets, diagnostics and treatments for cancer. Upon completion of training, the graduates will be better prepared to meet the specialized growing job market demand in the field of cancer.

MS, Biomedical Sciences (Regular Track) Graduate Requirements	Cancer Biology track in Biomedical Sciences (CB) Graduate Requirements
BSC6432 (BMS Core I), 5 cr	BSC6432 (BMS Core I), 5 cr
BSC6433 (BMS Core II), 5 cr	BSC6433 (BMS Core II), 5 cr
MCB6938 or IDS7690 (Grad Seminar), 1 cr (Must complete 2x1cr=2cr)	MCB6938 or IDS7690 (Grad Seminar), 1 c (Must complete 2x1cr=2cr)
BSC6431 (Practice of Biomed Sci), 3 cr	**PCB 5236 Cancer Biology (3 credit hours)**
BSC6407C Laboratory Methods in Molecular Biology, 3 cr	BSC6407C Laboratory Methods in Molecular Biology, 3 cr
Biomedical Specialization (only 2 courses required)	**Cancer Biology Track Elective Courses, 12 cr**
MCB 5225 Molecular Biology of Disease (3 cr) MCB 6226 Molecular Diagnostics (3 cr) PCB 5238 Immunobiology (3 cr) PCB 5236 Cancer Biology (3 cr) PCB 5275 Signal Transduction Mechanisms (3 cr) PCB 5527 Genetic Engineering and Biotechnology (3 cr) PCB 5709C Laboratory Virtual Sim in Physiology (2 cr) PCB 5815 Molec Aspects of Obesity Metabolism (3 cr) PCB 5834C Advanced Human Physiology (4 cr) IDS 5127 Foundation of Bio-Imaging Science (3 cr) BSC 5418 Tissue Engineering (3 cr) GEB 5516 Technological Entrepreneurship (3 cr)	**Must take at least 4 courses of the following:** **(1) PCB 5025 Molecular and Cellular Pharmacology (3 cr)** **(2) MCB 5415 Cellular Metabolism (3 cr)** **(3) PCB 5235 Molecular Immunology (3 cr)** **(4) MCB 5225 Molecular Biology of Disease (3 cr)** **(5) PCB 6595 Regulation of Gene Expression (3 cr)** **(6) MCB 5505 Molecular Virology (3 cr)** **(7) PCB 5275 Signal Transduction Mechanisms (3 cr)** **(8) MCB 6226 Molecular Diagnostics (3 cr)** **(9) IDS 5127 Foundation of Bio-Imaging Science (3 cr)** **(10) BSC 5418 Tissue Engineering (3 cr)** **(11) BSC 5436 Biomedical Informatics:Structure Analysis (3cr)** **(12) PCB 5265 Stem Cell Biology (3 cr)** **Others, must be approved by program coordinator**
Microbiology Specialization (only 2 courses required)	
MCB 5205 Infectious Processes (3 cr) MCB 5505 Molecular Virology (3 cr) MCB 5208 Cellular Microbiology: Host-Pathogen (3 cr) MCB 5654 Applied Microbiology (3 cr) MCB 6417C Microbial Metabolism (3 cr) MCB 5932 Current Topics in Molecular Biology (3 cr) MCB 5415 Cellular Metabolism (3 cr) MCB 5209 Microbial Stress Response (3 cr) PCB 6595 Regulation of Gene Expression (3 cr) PCB 5235 Molecular Immunology (3 cr)	
MCB6026 Capstone Course, 3 cr Anything in Biomedical sciences	**MCB6026 Capstone Course, 3 cr ONLY: in Cancer Biology area**
Pass Oral Comprehensive Exam (Capstone)	Pass Oral Comprehensive Exam (Capstone)
Teaching Requirements: 2 semesters	**Teaching Requirement: 1 semester**
Research Shadowing: No	**Research Shadowing in Cancer Biology area: Optional (1 semester)**
TOTAL CREDITS = 33	TOTAL CREDITS = 33

Burnett School of Biomedical Sciences College of Medicine

MS BIOMEDICAL SCIENCES PROGRAM

Cancer Biology (CB) Track

PROGRAM DESCRIPTION

The Master of Science in Biomedical Sciences Program *Cancer Biology (CB) Track* is a non-thesis option for students wanting to further their knowledge in the area of Cancer Biology and applications in related disciplines like pharmacology, immunology, metabolism, stem cell biology or informatics and who may pursue doctoral training or pursue professional education focused on medicine and cancer research.

Students interested in research and thesis work should apply to the Master of Science in Biotechnology program.

CURRICULUM

The Biomedical Sciences Cancer Biology (track) non-thesis program requires a minimum of 33 credit hours of courses that includes a capstone experience. The Program addresses the need of applicants who want to further their knowledge in the basic and applied areas of Cancer Biology and want to pursue doctoral training or professional education with a focus on medicine and related cancer research and technology. Students will take a series of required Core courses, with the remaining courses relevant to Cancer Biology and related disciplines and will be required to complete a Capstone project related to the mission of the track.

Non-thesis students are not considered for departmental graduate assistantships or tuition assistance.

NON-THESIS OPTION - 33 Credit Hours minimum

REQUIRED COURSES - 18 Credit Hours

- BSC 6432 Structure-Function-Relationships of Biomedical Sciences I (5 credit hours)
- BSC 6433 Structure-Function-Relationships of Biomedical Sciences II (5 credit hours)
- BSC 6407C Laboratory Methods in Molecular Biology (3 credit hours)
- PCB 5236 Cancer Biology (3 cr)
- MCB 6938 Seminar or IDS 7690 Seminar (1 credit hour, to be repeated by all students)

ELECTIVE COURSES - 12 Credit Hours

Non-thesis students must take 12 credit hours of electives in related disciplines:

Must take at least 4 courses of the following:

- **PCB 5025 Molecular and Cellular Pharmacology (3 credit hours)**
- **MCB 5415 Cellular Metabolism (3 credit hours)**
- **PCB 5235 Molecular Immunology (3 credit hours)**
- **MCB 5225 Molecular Biology of Disease (3 credit hours)**

- **PCB 6595 Regulation of Gene Expression (3 credit hours)**
- **MCB 5505 Molecular Virology (3 cfredit hours)**
- **PCB 5275 Signal Transduction Mechanisms (3 credit hours)**
- **MCB 6226 Molecular Diagnostics (3 credit hours)**
- **IDS 5127 Foundation of Bio-Imaging Science (3 credit hours)**
- **BSC 5418 Tissue Engineering (3 credit hours)**
- **BSC 5436 Biomedical Informatics: Structure Analysis (3 credit hours)**
- **PCB 5265 Stem Cell Biology (3 credit hours)**
- **Others, must be approved by program coordinator**

CAPSTONE-(Cancer Biology) 3 Credit Hours

- MCB 6026 Capstone Course (3 credit hours minimum)

An in-depth current literature research report in the area of Cancer Biology and related disciplines will be required for each student. The student will select a faculty adviser to chair a faculty committee of three members for evaluation of the report.

An oral presentation on the written capstone report will be used as a final examination. A majority of the Committee must be present for the final examination. Before graduation, the report should be submitted for consideration of publication as a review article in appropriate journals.

LABORATORY OBSERVATION (Optional)

Students are encouraged to spend one semester of research shadowing in the lab of the Capstone project chair.

COMPREHENSIVE EXAM

Non-thesis students must pass an oral comprehensive exam to qualify for the Master of Science degree.

Students must successfully pass an oral comprehensive examination to test the understanding of the basic concepts in the field and relevant applications. The comprehensive examination will be conducted during the capstone defense and will be administered by the capstone committee. Should the student fail this exam, a second opportunity will be provided within 2 weeks of the first attempt. A second failure will result in dismissal from the program.

TEACHING REQUIREMENT

Students without significant prior teaching experience, such as, but not limited to, a minimum of a year in secondary schools or colleges, are required to serve as Classroom Laboratory Assistants (CLA) for a minimum of one semester (one semester in at least one lab section).

INDEPENDENT LEARNING

In the final semester of study, non-thesis students will complete a capstone course that requires an in-depth current literature research report on a relevant subject, which will serve as the independent learning experience. The student will select a faculty adviser to chair a faculty committee of three members for evaluation of the report.

Suggested Choreography
Year I
Fall

- BSC 6432 Structure-Function- Relationships of Biomedical Sciences I(5.0)
- MCB 6938 Lecture/Seminar (1.0)
- MCB 6407C (Laboratory Methods in Molecular Biology) (3.0)

Semester Total: 9 credit hours

Spring

- BSC 6433 Structure-Function- Relationships of Biomedical Sciences II(5.0)
- PCB 5236 Cancer Biology (3.0)
- MCB 6938 Lecture/Seminar (1.0)

Semester Total: 9 credit hours

Summer

- Elective 1 (3.0)
- MCB 6026
- Capstone/Comprehensive Exam (3.0)
- Teaching One Lab Section

Semester Total: 6 credit hours

Year 2
Fall

- Elective 2 (3.0)
- Elective 3 (3.0)
- Elective 4 (3.0)
- Research Shadowing (optional)

Semester Total: 9 credit hours

Students are required to complete a Plan of Study specifying course degree requirements

College: Medicine
Degree: MS Biomedical Sciences
Track: Interdisciplinary Cancer Biology (ICB)
Department: Molecular Biology and Microbiology
Program Websites: http://biomed.ucf.edu

Memo

To: Requesting faculty

Dr. Deborah German, Dean, UCF College of Medicine

Dr. Griffith Parks, Director, Burnett School of Biomedical Sciences

Dr. Saleh A. Naser, Associate Director, Graduate Affairs

Dr. Richard Peppler, Associate Dean of Faculty and Academic Affairs, UCF College of Medicine

Mrs. Nadine Dexter, Library Director, UCF College of Medicine

Mrs. Ying Zhang, Dept. Head, Acquisitions & Collections

Ms. Mary Page, Assoc. Director, Technical Services

Mr. Barry Baker, Director of Libraries

Dr. John Weishampel, College of Graduate Studies/Undergraduate Studies

Dr. Elizabeth A. Klonoff, Vice President of Research and Dean of the College of Graduate Studies

From: Deedra Walton, Head of Electronic Resources and Pammy Herring, Electronic Resources Librarian UCF College of Medicine Harriet F. Ginsburg Health Sciences Library

Subject: Library Evaluation of the Proposal to add Cancer Biology Non-thesis track in M.S. Biomedical Sciences in the Burnett School of Biomedical Sciences College of Medicine

Date: September 2, 2016

When reviewing library support for a new Cancer Biology Track in M.S. program in Biomedical Sciences, Dr. Saleh Naser and I selected the following institutions for the comparison:

- University of Florida, PhD in Cancer Biology Concentration
- Emory University, PhD in Cancer Biology
- Drexel University, M.S. in Cancer Biology
- Washington University in St. Louis, Pre/Postdoctoral Program in Cancer Biology Pathway

Databases:
Overall, the UCF Libraries database list compares favorably with the chosen institutions and will support a Master's degree in Cancer Biology. However, we are lacking several databases held by the other institutions compared to ours.

- EMBASE is a biomedical literature database providing in-depth coverage of pharmacology, pharmaceutical science and clinical research. 30% of the journal titles indexed are unique to EMBASE and are not indexed in MEDLINE. Only Emory University subscribes to EMBASE. While this database may be beneficial to the Cancer Biology program, it is not a necessary database.

- Scopus, like Web of Science, is an abstract and citation database of peer reviewed literature across the fields of science, math, technology, engineering and medicine. Emory, Drexel and Washington University subscribe to Scopus. While this database may be beneficial to the Cancer Biology program, it is not a necessary database.

- Current Protocols is a collection of 18 peer-reviewed, regularly updated laboratory procedures. The UCF Health Sciences Library currently subscribes to **Current Protocols in Cell Biology** and **Current Protocols in Microbiology**. If other Current Protocols are needed, we will ask the College of Medicine for funds to support the subscriptions for the requested protocols.

Journals:
Overall, the UCF Libraries and the Health Sciences Library journal holdings list compare favorably with the chosen institutions and will support a Master's degree in Cancer Biology. However, we do not provide access to 5 journals: **Advances in Cancer Research**, **Cold Spring Harbor Protocols**, **Current Opinion in Oncology**, **Epigenetics,** and **Journal of Immunotherapy**. We will gauge inter-library loan requests for these journals, and if faculty and students requests warrant it, we will ask the College of Medicine for funds to support the subscriptions to these journals.

Books:
The analysis of the book collection shows that UCF Libraries compares favorably with Emory University, Drexel University, and Washington University in monograph holdings. The University of Florida has more volumes than all other institutions compared, except in the subject of stem cell biology in which Washington University is higher. While UCF Libraries book holdings will support a Master's degree in Cancer Biology, we are requesting funds in the amount of $5,000 for the first year, $4,000 for the second year and $3,000 for the subsequent years to increase e-book holdings in subject areas that are lacking when compared to other institutions, such as stem cell biology, cell biology and oncology.

Summary:
In comparing library collections at the selected aspiring programs, monograph holdings should increase in certain subject areas. The total cost for library materials is $5,000 for the first year, $4,000 for the second year and $3,000 for the subsequent years (see the chart below). After the five year period, ongoing funds will need to be added to the library budget to cover ongoing expenses. Currently, UCF Libraries subscribes to the databases and journals needed to support the M.S. in Cancer Biology. However, the library will monitor faculty and students requests for additional resources and will subscribe to new resources as needed provided that funding is supplied by the College of Medicine.

In the unfortunate event library budget shortfalls occur, some existing resource subscriptions may be cut or scaled back.

Estimates on costs needed to acquire library materials to support the new M.S. in Cancer Biology

	2016	**2017**	**2018**	**2019**	**2020**	**2021**
Books	$5,000	$4,000	$3,000	$3,000	$3,000	$3,000

Comparative Analysis on key library resources supporting the new M.S In Cancer Biology

Databases

	UCF	UF	Emory	Drexel	WU
Access Medicine	X	X	X	X	X
ClinicalKey	X		X	X	
Cochrane Library	X	X	X	X	X
Current Protocols (Wiley)	X	X	X	X	X
EMBASE			X		
National Academies Press (Free)	X	X	X	X	X
Ovid	X	X	X	X	X
PubMed	X	X	X	X	X
NCBI Bookshelf	X		X	X	X
Scopus			X	X	X
Springer E-Book Collection	X	X	X		X
Springer Protocols	X	X	X	X	X
STAT!Ref (COM Only)	X	X		X	X
UpToDate (COM Only)	X	X			X
Web of Science (Science Citation Index)	X	X	X	X	X
Wiley Online Library	X	X	X	X	X

Key Journals

	UCF	UF	Emory	Drexel	WU
Advances in Biological Regulation	X	X	X	X	X
Advances in Cancer Research			X		X
American Journal of Cancer Research	X	X	X	X	X
Angiogenesis	X	X	X	X	X
Biochimica et Biophysica Acta - Reviews on Cancer	X	X	X	X	X
Breast Cancer Research	X	X	X	X	X
Breast Cancer Research and Treatment	X	X	X	X	X
British Journal of Cancer	X	X	X	X	X
Cancer	X	X	X	X	X
Cancer and Metastasis Reviews	X	X	X	X	X
Cancer Cell	X	X	X	X	X
Cancer Immunology, Immunotherapy	X	X	X	X	X
Cancer Journal	X	X	X	X	X
Cancer Letters	X	X	X	X	X
Cancer Prevention Research	X	X	X	X	X
Cancer Research	X	X	X	X	X

DW & PH Aug 2016

Carcinogenesis	X	X	X	X	X
Cell Death and Disease	X	X	X	X	X
Cell Host and Microbe	X	X	X	X	X
Clinical Cancer Research	X	X	X	X	X
Cold Spring Harbor Protocols		X	X		X
Current Opinion in Oncology		X	X	X	X
Drug Resistance Updates	X	X	X	X	X
Endocrine-Related Cancer	X	X			X
Epigenetics		X	X	X	X
European Journal of Cancer	X	X	X	X	X
Frontiers in Oncology	X	X	X	X	X
Genes and Cancer	X	X	X	X	X
Genes Chromosomes and Cancer	X	X	X	X	X
International Journal of Cancer	X	X	X	X	X
International Journal of Radiation Oncology Biology Physics	X	X	X	X	X
Journal of Clinical Oncology	X	X	X	X	X
Journal of Hematology and Oncology	X	X		X	X
Journal of Immunotherapy (Hagerstown, MD. : 1997)		X	X	X	X
Journal of Mammary Gland Biology and Neoplasia	X	X	X	X	X
Journal of the National Cancer Institute	X	X	X	X	X
JoVE	X	X		X	X
Leukemia	X	X	X	X	X
Lung Cancer (open access)	X	X	X	X	X
Molecular Cancer (open access)	X	X	X	X	X
Molecular Cancer Research	X	X	X	X	X
Molecular Cancer Therapeutics	X	X	X	X	X
Molecular Oncology	X	X	X	X	X
Nature Methods	X	X	X	X	X
Nature Protocols	X	X	X	X	X
Nature Reviews Cancer	X	X	X	X	X
Neoplasia	X	X	X	X	X
Neuro-Oncology	X	X	X	X	X
Oncogene	X	X	X	X	X
Oncogenesis	X	X	X	X	X
Oncologist	X	X	X	X	X
PLoS Genetics	X	X	X	X	X
Seminars in Cancer Biology	X	X	X	X	X
Seminars in Radiation Oncology	X	X	X	X	X

Books *(by the Subject headings, keywords provided or LC ranges)*
Year range: 2002-2017

Subject	**UCF**	**UF**	**Emory**	**Drexel**	**WU**
Cancer	2,151	2,975	1,312	1,467	896
Metastasis	62	99	16	33	61
Molecular Biology	841	1,988	525	1,102	485
Stem Cell Biology	59	224	11	77	1,146
Biochemistry	987	3,703	344	1,188	236
Genetics	2,978	5,646	1,322	2,742	1,672
Cell Biology	490	1,990	218	622	73
Oncology	531	2,012	125	612	119
Immunology	724	1,350	394	503	563
Cellular Metabolism	31	69	10	16	102
Cellular Signal Transduction	261	269	120	66	95
Nanotechnology	1,854	1,871	585	911	317

Books: We are requesting funds to increase holdings in subject areas that are lacking when compared to other institutions, such as stem cell biology, cell biology and oncology. The total cost for library materials is $5,000 for the first year, $4,000 for the second year and $3,000 for the subsequent years.

UNIVERSITY OF CENTRAL FLORIDA
COLLEGE OF GRADUATE STUDIES

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☐ Course Action Request forms, as needed.

☑ Library assessment of resources.

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Proposed Effective Term/Year: Immediately

Unit(s) Housing Program: Burnett School of Biomedical Sciences

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Please check all that apply: This action affects a: ☐ Program ☑ Track ☐ Certificate

DELIVERY: Program will be delivered: ☐ Face to Face ☐ Completely Online ☐ Mixed Delivery

Will the program be a **market tuition rate** program? ☐ Yes ☐ No

Brief description of program and rationale for the addition: **Do not add complete catalog copy here.**

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If yes, state the name of the program or track where students are currently enrolled and attach a list of students if possible:

Students enrolled in MS Biomedical Sciences may choose to select Cancer Biology Track.

Will students have the option to stay in their existing program, track, or certificate? ☐ Yes ☐ No

If yes, how will current students be impacted by the addition of a program, track or certificate?

Current enrolled students in MS Biomedical Sciences will be given an opportunity to select Cancer Biology Track, if interested. The main goal of the new track is to increase regional/national/international enrollment in the Burnett School of Biomedical Sciences Graduate Program and the College of Graduate Studies.

Future Students

Provide a statement of who is likely to enroll and why. Please state if there is licensure or certification that depends upon this education, etc. Also, complete the following table.

-Students with ambition to pursue a career in Cancer Research.
-Students with ambition to pursue doctoral/Medical/other professional education and in need of additional academic credentials.
-Others seeking professional development in clinical and health careers related to cancer patients.

	Year 1	Year 2	Year 3
Headcount	10	25 (15 1st yr + 10 2nd yr)	35 (20 1st yr + 15 2nd yr)
SCHs	240 (24 hrs for 1st yr)	450 (9 hrs for 2nd yr + 24 hrs for 1st yr)	615 (9 hrs for 2nd yr + 24 hrs for 1st yr)

Indicate likely career or student outcomes upon completion: (What will students do? What will their job titles be?)

Pursue professional education (MD, PHD, DOD...)
Pursue career in Medicine, Physiology, Cancer Biology, or other health/clinical professions.

Please complete the following table on financial support: (Specify all forms of support – assistantships, fellowships, and tuition remission.)

	Number of assistantship students	Source of funds	Number of fellowship students (specify fellowship)	Number of tuition remissions	Source of funds
Year 1	No		No	No	
Year 2	No		No	No	
Year 3	No		No	No	

Signature Page

Recommend Approval (all approval levels must be signed)

Department Chair /Director (Print) Griffith Parks (Signature) _____ Date 8-2-16

College Academic Standards (Print) Saleh Naser (Signature) _____ Date 8/2/2016

College Dean (Print) Richard Peppler (Signature) _____ Date 8-3-16

Graduate Council (Print) _____ (Signature) _____ Date _____

Graduate Dean (Print) _____ (Signature) _____ Date _____

Approval

Provost and Executive Vice President: _____ Date _____

Distribution: After approval is received from the Provost, distribution will be to:

Department(s); College; Registrar; Associate Registrar; Institutional Knowledge Management; Academic Services; College of Graduate Studies

Proposal

Infectious Disease (ID)

Non-thesis track in MS Biomedical Sciences

Burnett School of Biomedical Sciences College of Medicine

Dean: Deborah German
Director: Griffith Parks
Coordinator: Saleh Naser

407-823-0955
Saleh.naser@ucf.edu

Non-thesis Infectious Disease track

In MS Biomedical Sciences

Burnett School of Biomedical Sciences; College of Medicine

With new leadership in the Burnett School of Biomedical Sciences (BSBS), there is now a clearer roadmap to advance the academic and research missions In the School, with the goal of becoming a Tier 1 academic/research Institution. The new Director's roadmap for the School includes an emphasis on developing cohesive science-based units that have a shared identity. A cornerstone of this plan involves establishing divisions within BSBS, including Neuroscience, Cancer Biology, Infectious disease, and Metabolic and Cardiovascular Sciences. Academic tracks at the MS and PhD level will play an essential role in this plan, since training and educating graduate students in these focused scientific areas will be drivers in the identity, growth, interactions, and sustainability of each of the departments.

MS Biomedical Sciences:

is a non-thesis broadly based graduate program which we identified as a starting point to execute the BSBS Director's plan.

We plan to develop non-thesis tracks in each of BSBS divisions as follow:

1. Non-thesis MS Neuroscience track: approved in Fall 2015
   Inauguration class:
   30 applications received for Fall 2016
   16 students admitted.
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   proposal under your review (submitted separately)
3. Non-thesis MS Infectious Disease track:
   proposal under your review
4. Non-thesis MS Cancer Biology track:
   proposal in preparation

The new tracks will:

1- provide significant visibility and marketing of COM graduate programs and ultimately recruitment of more quality national/international students.

2- retain many of the UCF students who are seeking professional education following undergraduate graduation.

3- be self-sustained and will not require development of new courses or recruitment of new instructors.

4- solidify and strengthen partnerships with other UCF units including Computer Sciences, COHPA and others.

5- form the core from which potential Training Grants and Fellowship Programs can emerge.

6- become a pipeline to the interdisciplinary Biomedical PhD program which should increase the pool of applications and raise the quality of our students.

MS Biomedical Sciences track in Infectious Disease (ID) will focus on educating and training students in the area of Infectious diseases. The graduates will be better prepared to meet a more specialized growing job market demand.

MS, Biomedical Sciences (Regular Track) Graduate Requirements	**Infectious Disease track in Biomedical Sciences (ID) Graduate Requirements**
BSC6432 (BMS Core I), 5 cr	**BSC6432 (BMS Core I), 5 cr**
BSC6433 (BMS Core II), 5 cr	**BSC6433 (BMS Core II), 5 cr**
MCB6938 or IDS7690 (Grad Seminar), 1 cr (Must complete 2x1cr=2cr)	**MCB6938 or IDS7690 (Grad Seminar), 1 cr** **(Must complete 2x1cr=2cr)**
BSC6431 (Practice of Biomed Sci), 3 cr	MCB 5208 Cellular Microbiology: Host-Pathogen Interactions (3 cr)
BSC6407C Laboratory Methods in Molecular Biology, 3 cr	**BSC6407C Laboratory Methods** **in Molecular Biology, 3 cr**
Biomedical Specialization (only 2 courses required) MCB 5225 Molecular Biology of Disease (3 cr) MCB 6226 Molecular Diagnostics (3 cr) PCB 5238 Immunobiology (3 cr) PCB 5236 Cancer Biology (3 cr) PCB 5275 Signal Transduction Mechanisms (3 cr) PCB 5527 Genetic Engineering and Biotechnology (3 cr) PCB 5709C Laboratory Virtual Sim in Physiology (2 cr) PCB 5815 Molec Aspects of Obesity Metabolism (3 cr) PCB 5834C Advanced Human Physiology (4 cr) IDS 5127 Foundation of Bio-Imaging Science (3 cr) BSC 5418 Tissue Engineering (3 cr) GEB 5516 Technological Entrepreneurship (3 cr) Microbiology Specialization (only 2 courses required) MCB 5205 Infectious Processes (3 cr) MCB 5505 Molecular Virology (3 cr) MCB 5208 Cellular Microbiology: Host-Pathogen (3 cr) MCB 5654 Applied Microbiology (3 cr) MCB 6417C Microbial Metabolism (3 cr) MCB 5932 Current Topics in Molecular Biology (3 cr) MCB 5415 Cellular Metabolism (3 cr) MCB 5209 Microbial Stress Response (3 cr) PCB 6595 Regulation of Gene Expression (3 cr) PCB 5235 Molecular Immunology (3 cr)	**Infectious Disease Track Elective Courses, 12 cr** **Must take at least 4 courses of the following:** • **PCB 5527 Genetic Engineering and Biotechnology (3 credit hours)** • **MCB 5205 Infectious Processes (3 credit hours)** • **MCB 5505 Molecular Virology (3 credit hours)** • **MCB 5654 Applied Microbiology (3 credit hours)** • **MCB 6417C Microbial Metabolism (3 credit hours)** • **MCB 5932 Current Topics in Molecular Biology (3 credit hours)** • **MCB 5415 Cellular Metabolism (3 credit hours)** • **MCB 5209 Microbial Stress Response (3 credit hours)** • **PCB 6595 Regulation of Gene Expression (3 credit hours)** • **PCB 5235 Molecular Immunology (3 credit hours)** • **MCB 5225 Molecular Biology of Disease (3 credit hours)** • **PCB 5238 Immunobiology (3 credit hours)** • **PCB 5275 Signal Transduction Mechanisms (3 credit hours)** • **Others, must be approved by program coordinator**
MCB6026 Capstone Course, 3 cr Anything in Biomedical sciences	**MCB6026 Capstone Course, 3 cr ONLY in Infectious Disease area**
Pass Oral Comprehensive Exam (Capstone)	**Pass Oral Comprehensive Exam (Capstone)**
Teaching Requirements 2	**Teaching Requirement 1 semester teaching**
Research Shadowing No	**Research Shadowing in Infectious Disease area** **Optional (1 semester)**
TOTAL CREDITS = 33	TOTAL CREDITS = 33

Burnett School of Biomedical Sciences

College of Medicine

MS BIOMEDICAL SCIENCES PROGRAM

Infectious Disease (ID) Track

PROGRAM DESCRIPTION

The Master of Science in Biomedical Sciences Program *Infectious Disease (ID) Track* is a non-thesis option for students wanting to further their knowledge in the area of Infectious diseases and who may pursue doctoral training or pursue professional education focused on medicine and research in Infectious disease.

Students interested in research and thesis work should apply to the Master of Science in Biotechnology program.

CURRICULUM

The Biomedical Sciences Infectious Disease (track) non-thesis program requires a minimum of 33 credit hours of courses that includes a capstone experience. The Program addresses the need of applicants who want to further their knowledge in the area of Infectious diseases and want to pursue doctoral training or professional education with a focus on medicine and related research. Students will take a series of required Core courses, with the remaining courses relevant to Infectious diseases and will be required to complete a Capstone project related to the mission of the track.

Non-thesis students are not considered for departmental graduate assistantships or tuition assistance.

NON-THESIS OPTION - 33 Credit Hours minimum

REQUIRED COURSES - 18 Credit Hours

- BSC 6432 Structure-Function-Relationships of Biomedical Sciences I (5 credit hours)
- BSC 6433 Structure-Function-Relationships of Biomedical Sciences II (5 credit hours)
- BSC 6407C Laboratory Methods in Molecular Biology (3 credit hours)
- Cellular Microbiology: Host-Pathogen Interactions (3 cr)
- MCB 6938 Seminar or IDS 7690 Seminar (1 credit hour, to be repeated by all students)

ELECTIVE COURSES - 12 Credit Hours

Non-thesis students must take 12 credit hours of electives listed for Metabolic and Cardiovascular Sciences courses:

Must take at least 4 courses of the following:

- **PCB 5527 Genetic Engineering and Biotechnology (3 credit hours)**
- **MCB 5205 Infectious Processes (3 credit hours)**
- **MCB 5505 Molecular Virology (3 credit hours)**
- **MCB 5654 Applied Microbiology (3 credit hours)**
- **MCB 6417C Microbial Metabolism (3 credit hours)**
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- **MCB 5225 Molecular Biology of Disease (3 credit hours)**
- **PCB 5238 Immunobiology (3 credit hours)**
- **PCB 5275 Signal Transduction Mechanisms (3 credit hours)**
- **Others (must be approved by Program Coordinator)**

CAPSTONE-(Infectious Disease) 3 Credit Hours

• MCB 6026 Capstone Course (3 credit hours minimum)

An in-depth current literature research report in the area of Infectious Disease will be required for each student. The student will select a faculty adviser to chair a faculty committee of three members for evaluation of the report.

An oral presentation on the written capstone report will be used as a final examination. A majority of the Committee must be present for the final examination. Before graduation, the report should be submitted for consideration of publication as a review article in appropriate journals.

LABORATORY OBSERVATION (Optional)

Students are encouraged to spend one semester of research shadowing in the lab of the Capstone project chair.

COMPREHENSIVE EXAM

Non-thesis students must pass an oral comprehensive exam to qualify for the Master of Science degree.

Students must successfully pass an oral comprehensive examination to test the understanding of the basic concepts in the field and relevant applications. The comprehensive examination will be conducted during the capstone defense and will be administered by the capstone committee. Should the student fail this exam, a second opportunity will be provided within 2 weeks of the first attempt. A second failure will result in dismissal from the program.

TEACHING REQUIREMENT

Students without significant prior teaching experience, such as, but not limited to, a minimum of a year in secondary schools or colleges, are required to serve as Classroom Laboratory Assistants (CLA) for a minimum of one semester (one semester in at least one lab section).

INDEPENDENT LEARNING

In the final semester of study, non-thesis students will complete a capstone course that requires an in-depth current literature research report on a relevant subject, which will serve as the independent learning experience. The student will select a faculty adviser to chair a faculty committee of three members for evaluation of the report.

Suggested Choreography

Year 1

Fall

- BSC 6432 Structure-Function-Relationships of Biomedical Sciences I (5.0)
- MCB 6938 Lecture/Seminar (1.0)
- MCB 6407C (Laboratory Methods in Molecular Biology) (3.0)

Semester Total: 9 credit hours

Spring

- BSC 6433 Structure-Function-Relationships of Biomedical Sciences II (5.0)
- Elective 1 (3.0)
- MCB 6938 Lecture/Seminar (1.0)

Semester Total: 9 credit hours

Summer

- Elective 2 (3.0)
- MCB 6026 Capstone/Comprehensive Exam (3.0)
- Teaching One Lab Section

Semester Total: 6 credit hours

Year 2

Fall

- MCB 5208 Cellular Microbiology: Host-Pathogen Interaction (3 cr)
- Elective 3 (3.0)
- Elective 4 (3.0)
- Teaching One Lab Section

Semester Total: 9 credit hours

Students are required to complete a Plan of Study specifying course degree requirements

College: Medicine
Degree: MS Biomedical Sciences
Track: Infectious Disease (ID)
Department: Molecular Biology and Microbiology
Program Websites: http://biomed.ucf.edu

Memo

To: **Dr. Deborah German, Dean, UCF College of Medicine**

Dr. Griffin Parks, Director, Burnett School of Biomedical Sciences

Dr. Saleh A. Naser, Associate Director, Graduate Affairs

Ms. Nadine Dexter, Library Director, UCF College of Medicine

Mrs. Ying Zhang, Interim Dept. Head, Acquisitions & Collections

Ms. Mary Page, Assoc. Director, Technical Services

Mr. Barry Baker, Director of Libraries

Dr. John Weishampel, College of Graduate Studies/Undergraduate Studies

Dr. Mubarkar Shah, Interim Vice Provost and Dean, Graduate School

From: Deedra J. Walton, Head of Electronic Resources, Harriet F. Ginsburg Health Sciences Library

Subject: Library Evaluation of the Proposal to add Infectious Disease Non-Thesis Track in the M.S. in Biomedical Sciences

Date: March 29, 2016

Hereafter, the faculty member requesting the library evaluation should submit the request 6-weeks prior to the due date to allow the library faculty member the adequate time necessary to conduct the evaluation while taking into consideration the librarian's other job responsibilities.

When reviewing library support for a new Infectious Disease Non-thesis Track in the M.S. in Biomedical Sciences, Dr. Saleh Naser and I selected the following institutions for the comparison:

- University of Florida (MS, PhD)
- Emory University (PhD)
- Drexel University (MS)

Databases Analysis: UCF Libraries has the databases to support the proposed master's program. The libraries lack 2 databases (Embase and Scopus) held by one of the comparison institutions. Should this program expand into a Ph.D., a subscription to **Embase** should be considered.

- **Embase** increases the discovery of biomedical evidence to support critical life sciences functions, delivering relevant, up-to-date biomedical information to the global biomedical research community. Over 30 million abstracts and indices from published, peer-reviewed biomedical literature, in-press publications and conferences are available on Embase.
- **Scopus** is similar to Web of Science. It is an abstract and citation database of peer reviewed literature across the fields of science, math, technology, engineering and medicine. This has

been on the Library's wish list for some time. While it would be beneficial, it is not a necessary database.

Databases Cost: $0.00. If the program expands to a Ph.D program, the estimated cost of subscribing to **EMBASE is $10,000 plus 7% inflation each year thereafter.**

Journals Analysis: UCF Libraries journal holdings list compares favorably with the institutions chosen for comparison. No additional journals are needed at this time. UCF Libraries is only missing 1 journal from the journal analysis list: **Current Opinion in HIV and AIDS**. This title is part of a large, very expensive online journal package from OVID. However, **a print subscription costs $1,093.00 plus 7% inflation each year.**

Journals Cost: $0.00.

Books: The analysis of the book collection shows that UCF Libraries compares favorably with the other institutions. Only UF has more volumes than UCF.

Books Costs: $ 0.00

Estimated cost needed to acquire library materials to support the new Infectious Diseases M.S is $0.00

See chart below for estimated total cost of additional resources for the Infectious Diseases program per year.

	2016	2017	2018	2019	2020	2021
Databases (Ph.D. Only)	**$10,000**	**$10,700**	**$11,449**	**$12,215**	**$13,108**	**$14,026**
Journal (print only)	**$1,093**	**$1,170**	**$1,252**	**$1,340**	**$1,434**	**1,535**
Books	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Total	**$11,093**	**$11,870**	**$12,701**	**$13,555**	**$14,542**	**$15,561**

Summary: The Infectious Diseases M.S may currently be offered at no additional cost for library materials. If the program chooses to add the missing journal, UCF Libraries will need funds to start the subscription. Should the program expand to a Ph.D., a subscription to EMBASE should be considered. Please see the chart above for cost estimates. After the initial five-year period, costs will continue to increase. Money will need to be added to the Library budget to cover those expenses, especially the subscriptions of databases and journals. In the unfortunate event of library budget shortfalls occurring some existing resource subscriptions may be cut or scaled back.

DW March 2016

Comparative Analysis on key library resources supporting the new Infectious Diseases M.S.

Databases

	UCF	UF	Emory	Drexel
Access Medicine	X	X	X	X
Access Pharmacy	X	X		
ARRS Goldminer (free)	X			
BioMed Central	X	X		
BioOne	X	X		
BIOSIS Citation Index	X	X		
Biotechnology Research Abstract	X	X		
ClinicalKey	X		X	X
Cochrane Library	X	X	X	X
EMBASE			X	
Facts & Comparison	X			
Google Scholar	X	X	X	X
Lexi-Comp	X			
Medline	X	X	X	X
National Academies Press	X	X		
Natural Medicines	X	X		X
National Center for Biotechnology Information (NCBI) (free)	X	X		
PsycINFO	X	X	X	X
PubMed	X	X	X	X
PubMed Central	X	X		
R2 Digital Library	X	X	X	
Science Direct	X	X	X	X
Scopus			X	
SpringerLink	X	X		
STAT!Ref	X	X	X	X
Virology & AIDS Abstract	X	X		
Web of Sciences	X	X	X	X

Journals

Journal Titles	UCF	UF	Emory	Drexel
Advances in Virus Research	X	X	X	
AIDS	X	X	X	X
AIDS and Behavior	X	X	X	X
AIDS Patient Care and STDs	X	X	X	X
AIDS Reviews	X	X	X	
Antimicrobial Agents and Chemotherapy	X	X	X	X
Antiviral Therapy	X	X	X	
BMC Infectious Diseases	X	X	X	X
Cellular and Molecular Immunology	X	X	X	X
Clinical Infectious Disease	X	X	X	X

DW March 2016

Clinical Microbiology and Infection	X	X	X	X
Clinical Microbiology Reviews	X	X	X	X
Current HIV/AIDS Reports	X	X	X	X
Current Opinion in HIV and AIDS		X	X	X
Current Opinion in Infectious Diseases	X	X	X	X
Current Opinion in Microbiology	X	X	X	X
Drug Resistance Updates	X	X	X	X
Emerging Infectious Diseases	X	X	X	X
FEMS Microbiology Reviews	X	X	X	X
Frontiers in Cellular and Infection Microbiology	X	X	X	X
HIV Medicine	X	X	X	X
Infection and Immunity	X	X	X	X
Infection Control and Hospital Epidemiology	X	X	X	X
Immunity	X	X	X	X
International Journal of Antimicrobial Agents	X	X	X	X
International Journal of Medical Microbiology	X	X	X	X
International Journal of Parasitology	X	X	X	X
Journal of Acquired Immune Deficiency Syndromes	X	X	X	X
Journal of Clinical Virology	X	X	X	X
Journal of Infection	X	X	X	X
Journal of Infectious Diseases	X	X	X	X
Journal of the International AIDS Society	X	X	X	X
Journal of Viral Hepatitis	X	X	X	X
Lancet Infectious Diseases	X	X	X	X
Malaria Journal	X	X	X	X
Microbes and Infection	X	X	X	X
Open AIDS Journal	X	X	X	X
Parasites and Vectors	X	X	X	X
Pediatric Infectious Disease Journal	X	X	X	X
PLoS Neglected Tropical Diseases	X	X	X	X
Retrovirology	X	X	X	X
Reviews in Medical Virology	X	X	X	X
Sexually Transmitted Diseases	X	X	X	X
Sexually Transmitted Infections	X	X	X	X
Topics in Antiviral Medicine	X	X		
Trends in Microbiology	X	X	X	X
Trends in Parasitology	X	X	X	X
Vaccine	X	X	X	X
Viruses	X	X	X	X

Books *(by the Subject headings, keywords provided or LC ranges)*

Book publication range is 2000-2017

	UCF	**UF**	**Emory**	**Drexel**
Biotechnology--Research	40	64	70	412
Cell--Metabolism	19	30	44	148
Communicable Diseases	565	849	549	351
Emerging Infectious Diseases	74	83	37	93
Epidemiology	902	1236	1363	897
Genetic Engineering -- Research	40	58	28	164
Immunology	843	1298	666	363
Infection	1154	1951	193	611
Infectious Diseases	234	281	123	540
Microbial Metabolism	39	46	15	46
Molecular Biology	1039	1522	798	922
Medical History Taking--Methods	24	21	29	35
Public Health	4208	4783	3435	2614
Total books	**9181**	**12222**	**7350**	**7196**

Proposal

Infectious Disease (ID)

Non-thesis track in MS Biomedical Sciences

Burnett School of Biomedical Sciences College of Medicine

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Director: Griffith Parks
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Burnett School of Biomedical Sciences

College of Medicine

MS BIOMEDICAL SCIENCES PROGRAM

Infectious Disease (ID) Track

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- BSC 6407C Laboratory Methods in Molecular Biology (3 credit hours)
- Cellular Microbiology: Host-Pathogen Interactions (3 cr)
- MCB 6938 Seminar or IDS 7690 Seminar (1 credit hour, to be repeated by all students)

ELECTIVE COURSES - 12 Credit Hours

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Must take at least 4 courses of the following:

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- **MCB 5205 Infectious Processes (3 credit hours)**
- **MCB 5505 Molecular Virology (3 credit hours)**
- **MCB 5654 Applied Microbiology (3 credit hours)**
- **MCB 6417C Microbial Metabolism (3 credit hours)**
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- **PCB 5235 Molecular Immunology (3 credit hours)**
- **MCB 5225 Molecular Biology of Disease (3 credit hours)**
- **PCB 5238 Immunobiology (3 credit hours)**
- **PCB 5275 Signal Transduction Mechanisms (3 credit hours)**
- **Others (must be approved by Program Coordinator)**

CAPSTONE-(Infectious Disease) 3 Credit Hours

• MCB 6026 Capstone Course (3 credit hours minimum)

An in-depth current literature research report in the area of Infectious Disease will be required for each student. The student will select a faculty adviser to chair a faculty committee of three members for evaluation of the report.

An oral presentation on the written capstone report will be used as a final examination. A majority of the Committee must be present for the final examination. Before graduation, the report should be submitted for consideration of publication as a review article in appropriate journals.

LABORATORY OBSERVATION (Optional)

Students are encouraged to spend one semester of research shadowing in the lab of the Capstone project chair.

COMPREHENSIVE EXAM

Non-thesis students must pass an oral comprehensive exam to qualify for the Master of Science degree.

Students must successfully pass an oral comprehensive examination to test the understanding of the basic concepts in the field and relevant applications. The comprehensive examination will be conducted during the capstone defense and will be administered by the capstone committee. Should the student fail this exam, a second opportunity will be provided within 2 weeks of the first attempt. A second failure will result in dismissal from the program.

TEACHING REQUIREMENT

Students without significant prior teaching experience, such as, but not limited to, a minimum of a year in secondary schools or colleges, are required to serve as Graduate Teaching Assistants for a minimum of one semester (one semester in at least one lab section).

INDEPENDENT LEARNING

In the final semester of study, non-thesis students will complete a capstone course that requires an in-depth current literature research report on a relevant subject, which will serve as the independent learning experience. The student will select a faculty adviser to chair a faculty committee of three members for evaluation of the report.

Suggested Choreography

Year 1

Fall

- BSC 6432 Structure-Function-Relationships of Biomedical Sciences I (5.0)
- MCB 6938 Lecture/Seminar (1.0)
- MCB 6407C (Laboratory Methods in Molecular Biology) (3.0)

Semester Total: 9 credit hours

Spring

- BSC 6433 Structure-Function-Relationships of Biomedical Sciences II (5.0)
- Elective 1 (3.0)
- MCB 6938 Lecture/Seminar (1.0)

Semester Total: 9 credit hours

Summer

- Elective 2 (3.0)
- MCB 6026 Capstone/Comprehensive Exam (3.0)
- Teaching One Lab Section

Semester Total: 6 credit hours

Year 2

Fall

- MCB 5208 Cellular Microbiology: Host-Pathogen Interaction (3 cr)
- Elective 3 (3.0)
- Elective 4 (3.0)
- Teaching One Lab Section

Semester Total: 9 credit hours

Students are required to complete a Plan of Study specifying course degree requirements

College: Medicine
Degree: MS Biomedical Sciences
Track: Infectious Disease (ID)
Department: Molecular Biology and Microbiology
Program Websites: http://biomed.ucf.edu

Memo

To: **Dr. Deborah German, Dean, UCF College of Medicine**

Dr. Griffin Parks, Director, Burnett School of Biomedical Sciences

Dr. Saleh A. Naser, Associate Director, Graduate Affairs

Ms. Nadine Dexter, Library Director, UCF College of Medicine

Mrs. Ying Zhang, Interim Dept. Head, Acquisitions & Collections

Ms. Mary Page, Assoc. Director, Technical Services

Mr. Barry Baker, Director of Libraries

Dr. John Weishampel, College of Graduate Studies/Undergraduate Studies

Dr. Mubarkar Shah, Interim Vice Provost and Dean, Graduate School

From: Deedra J. Walton, Head of Electronic Resources, Harriet F. Ginsburg Health Sciences Library

Subject: Library Evaluation of the Proposal to add Infectious Disease Non-Thesis Track in the M.S. in Biomedical Sciences

Date: March 29, 2016

Hereafter, the faculty member requesting the library evaluation should submit the request 6-weeks prior to the due date to allow the library faculty member the adequate time necessary to conduct the evaluation while taking into consideration the librarian's other job responsibilities.

When reviewing library support for a new Infectious Disease Non-thesis Track in the M.S. in Biomedical Sciences, Dr. Saleh Naser and I selected the following institutions for the comparison:

- University of Florida (MS, PhD)
- Emory University (PhD)
- Drexel University (MS)

Databases Analysis: UCF Libraries has the databases to support the proposed master's program. The libraries lack 2 databases (Embase and Scopus) held by one of the comparison institutions. Should this program expand into a Ph.D., a subscription to **Embase** should be considered.

- **Embase** increases the discovery of biomedical evidence to support critical life sciences functions, delivering relevant, up-to-date biomedical information to the global biomedical research community. Over 30 million abstracts and indices from published, peer-reviewed biomedical literature, in-press publications and conferences are available on Embase.
- **Scopus** is similar to Web of Science. It is an abstract and citation database of peer reviewed literature across the fields of science, math, technology, engineering and medicine. This has

been on the Library's wish list for some time. While it would be beneficial, it is not a necessary database.

Databases Cost: $0.00. If the program expands to a Ph.D program, the estimated cost of subscribing to **EMBASE is $10,000 plus 7% inflation each year thereafter.**

Journals Analysis: UCF Libraries journal holdings list compares favorably with the institutions chosen for comparison. No additional journals are needed at this time. UCF Libraries is only missing 1 journal from the journal analysis list: **Current Opinion in HIV and AIDS**. This title is part of a large, very expensive online journal package from OVID. However, **a print subscription costs $1,093.00 plus 7% inflation each year.**

Journals Cost: $0.00.

Books: The analysis of the book collection shows that UCF Libraries compares favorably with the other institutions. Only UF has more volumes than UCF.

Books Costs: $ 0.00

Estimated cost needed to acquire library materials to support the new Infectious Diseases M.S is $0.00

See chart below for estimated total cost of additional resources for the Infectious Diseases program per year.

	2016	2017	2018	2019	2020	2021
Databases (Ph.D. Only)	**$10,000**	**$10,700**	**$11,449**	**$12,215**	**$13,108**	**$14,026**
Journal (print only)	**$1,093**	**$1,170**	**$1,252**	**$1,340**	**$1,434**	**1,535**
Books	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Total	**$11,093**	**$11,870**	**$12,701**	**$13,555**	**$14,542**	**$15,561**

Summary: The Infectious Diseases M.S may currently be offered at no additional cost for library materials. If the program chooses to add the missing journal, UCF Libraries will need funds to start the subscription. Should the program expand to a Ph.D., a subscription to EMBASE should be considered. Please see the chart above for cost estimates. After the initial five-year period, costs will continue to increase. Money will need to be added to the Library budget to cover those expenses, especially the subscriptions of databases and journals. In the unfortunate event of library budget shortfalls occurring some existing resource subscriptions may be cut or scaled back.

DW March 2016

Comparative Analysis on key library resources supporting the new Infectious Diseases M.S.

Databases

	UCF	UF	Emory	Drexel
Access Medicine	X	X	X	X
Access Pharmacy	X	X		
ARRS Goldminer (free)	X			
BioMed Central	X	X		
BioOne	X	X		
BIOSIS Citation Index	X	X		
Biotechnology Research Abstract	X	X		
ClinicalKey	X		X	X
Cochrane Library	X	X	X	X
EMBASE			X	
Facts & Comparison	X			
Google Scholar	X	X	X	X
Lexi-Comp	X			
Medline	X	X	X	X
National Academies Press	X	X		
Natural Medicines	X	X		X
National Center for Biotechnology Information (NCBI) (free)	X	X		
PsycINFO	X	X	X	X
PubMed	X	X	X	X
PubMed Central	X	X		
R2 Digital Library	X	X	X	
Science Direct	X	X	X	X
Scopus			X	
SpringerLink	X	X		
STAT!Ref	X	X	X	X
Virology & AIDS Abstract	X	X		
Web of Sciences	X	X	X	X

Journals

Journal Titles	UCF	UF	Emory	Drexel
Advances in Virus Research	X	X	X	
AIDS	X	X	X	X
AIDS and Behavior	X	X	X	X
AIDS Patient Care and STDs	X	X	X	X
AIDS Reviews	X	X	X	
Antimicrobial Agents and Chemotherapy	X	X	X	X
Antiviral Therapy	X	X	X	
BMC Infectious Diseases	X	X	X	X
Cellular and Molecular Immunology	X	X	X	X
Clinical Infectious Disease	X	X	X	X

DW March 2016

Clinical Microbiology and Infection	X	X	X	X
Clinical Microbiology Reviews	X	X	X	X
Current HIV/AIDS Reports	X	X	X	X
Current Opinion in HIV and AIDS		X	X	X
Current Opinion in Infectious Diseases	X	X	X	X
Current Opinion in Microbiology	X	X	X	X
Drug Resistance Updates	X	X	X	X
Emerging Infectious Diseases	X	X	X	X
FEMS Microbiology Reviews	X	X	X	X
Frontiers in Cellular and Infection Microbiology	X	X	X	X
HIV Medicine	X	X	X	X
Infection and Immunity	X	X	X	X
Infection Control and Hospital Epidemiology	X	X	X	X
Immunity	X	X	X	X
International Journal of Antimicrobial Agents	X	X	X	X
International Journal of Medical Microbiology	X	X	X	X
International Journal of Parasitology	X	X	X	X
Journal of Acquired Immune Deficiency Syndromes	X	X	X	X
Journal of Clinical Virology	X	X	X	X
Journal of Infection	X	X	X	X
Journal of Infectious Diseases	X	X	X	X
Journal of the International AIDS Society	X	X	X	X
Journal of Viral Hepatitis	X	X	X	X
Lancet Infectious Diseases	X	X	X	X
Malaria Journal	X	X	X	X
Microbes and Infection	X	X	X	X
Open AIDS Journal	X	X	X	X
Parasites and Vectors	X	X	X	X
Pediatric Infectious Disease Journal	X	X	X	X
PLoS Neglected Tropical Diseases	X	X	X	X
Retrovirology	X	X	X	X
Reviews in Medical Virology	X	X	X	X
Sexually Transmitted Diseases	X	X	X	X
Sexually Transmitted Infections	X	X	X	X
Topics in Antiviral Medicine	X	X		
Trends in Microbiology	X	X	X	X
Trends in Parasitology	X	X	X	X
Vaccine	X	X	X	X
Viruses	X	X	X	X

Books *(by the Subject headings, keywords provided or LC ranges)*

Book publication range is 2000-2017

	UCF	**UF**	**Emory**	**Drexel**
Biotechnology--Research	40	64	70	412
Cell--Metabolism	19	30	44	148
Communicable Diseases	565	849	549	351
Emerging Infectious Diseases	74	83	37	93
Epidemiology	902	1236	1363	897
Genetic Engineering -- Research	40	58	28	164
Immunology	843	1298	666	363
Infection	1154	1951	193	611
Infectious Diseases	234	281	123	540
Microbial Metabolism	39	46	15	46
Molecular Biology	1039	1522	798	922
Medical History Taking--Methods	24	21	29	35
Public Health	4208	4783	3435	2614
Total books	**9181**	**12222**	**7350**	**7196**

UNIVERSITY OF CENTRAL FLORIDA
COLLEGE OF GRADUATE STUDIES

NEW FORM – BEGINNING FALL 2015

Program Recommendation Form - ADDITIONS ONLY

This form is to be used to **ADD** degree programs, tracks, or certificate programs. If there are tracks being added to the program, one form may be used for both the program and the track(s).

Please refer to the Graduate Council Curriculum Meeting Schedule for submission deadlines.

Checklist of items to be attached with completed form:

☑ Complete and current Graduate Catalog copy (www.graduatecatalog.ucf.edu), including description, curriculum, contact information, application requirements, and application deadlines.

☐ A list of faculty who will participate in the program, track or certificate and their credentials.

☐ If applicable, a written agreement from all involved units that they are in support of, will provide courses to, or will participate in the program, track, or certificate.

☐ Course Action Request forms, as needed.

☑ Library assessment of resources.

College/Unit(s) Submitting Proposal: COM—BSBS

Proposed Effective Term/Year: Immediately

Unit(s) Housing Program: Burnett School of Biomedical Sciences

Name of program, track and/or certificate: Cancer Biology Track in MS Biomedical Sciences

Please check all that apply: This action affects a: ☐ Program ☑ Track ☐ Certificate

DELIVERY: Program will be delivered: ☐ Face to Face ☐ Completely Online ☐ Mixed Delivery

Will the program be a **market tuition rate** program? ☐ Yes ☐ No

Brief description of program and rationale for the addition: **Do not add complete catalog copy here.**

Cancer Biology Track is a non-thesis option in MS Biomedical Sciences which will attract, educate and train graduate students in the area Cancer Biology. Graduates in this program may pursue doctoral training or pursue professional education focused on Medicine, Physiology, and Cancer.

Impact on Current Students

Will students be moved from an existing program, track, or certificate into this new program, track, or certificate? ☐ Yes ☐ No

If yes, state the name of the program or track where students are currently enrolled and attach a list of students if possible:

Students enrolled in MS Biomedical Sciences may choose to select Cancer Biology Track.

Will students have the option to stay in their existing program, track, or certificate? ☐ Yes ☐ No

If yes, how will current students be impacted by the addition of a program, track or certificate?

Current enrolled students in MS Biomedical Sciences will be given an opportunity to select Cancer Biology Track, if interested. The main goal of the new track is to increase regional/national/international enrollment in the Burnett School of Biomedical Sciences Graduate Program and the College of Graduate Studies.

Future Students

Provide a statement of who is likely to enroll and why. Please state if there is licensure or certification that depends upon this education, etc. Also, complete the following table.

-Students with ambition to pursue a career in Cancer Research.
-Students with ambition to pursue doctoral/Medical/other professional education and in need of additional academic credentials.
-Others seeking professional development in clinical and health careers related to cancer patients.

	Year 1	Year 2	Year 3
Headcount	10	25 (15 1st yr + 10 2nd yr)	35 (20 1st yr + 15 2nd yr)
SCHs	240 (24 hrs for 1st yr)	450 (9 hrs for 2nd yr + 24 hrs for 1st yr)	615 (9 hrs for 2nd yr + 24 hrs for 1st yr)

Indicate likely career or student outcomes upon completion: (What will students do? What will their job titles be?)

Pursue professional education (MD, PHD, DOD...)
Pursue career in Medicine, Physiology, Cancer Biology, or other health/clinical professions.

Please complete the following table on financial support: (Specify all forms of support – assistantships, fellowships, and tuition remission.)

	Number of assistantship students	Source of funds	Number of fellowship students (specify fellowship)	Number of tuition remissions	Source of funds
Year 1	No		No	No	
Year 2	No		No	No	
Year 3	No		No	No	

Signature Page

Recommend Approval (all approval levels must be signed)

Department Chair /Director (Print) Griffith Parks (Signature) _____ Date 8-2-16

College Academic Standards (Print) Saleh Naser (Signature) _____ Date 8/2/2016

College Dean (Print) Richard Peppler (Signature) _____ Date 8-3-16

Graduate Council (Print) _____ (Signature) _____ Date _____

Graduate Dean (Print) _____ (Signature) _____ Date _____

Approval

Provost and Executive Vice President: _____ Date _____

Distribution: After approval is received from the Provost, distribution will be to:

Department(s); College; Registrar; Associate Registrar; Institutional Knowledge Management; Academic Services; College of Graduate Studies

From:	Andres Campiglia
To:	Saleh Naser
Cc:	Griffith Parks
Subject:	RE: permission to offer CHM 5305 Applied Biological Chemistry to Biomedical students
Date:	Tuesday, August 23, 2016 2:10:20 PM

Dr. Naser:
We are glad to hear that CHM 5305 Applied Biological Chemistry is of potential interest to graduate students enrolled in your program. We support its inclusion in your list of elective courses.
Best regards,
Andres.

Dr. Andres D. Campiglia
Professor and Graduate Coordinator
Department of Chemistry
University of Central Florida
Phone: 407-823-4162
E-mail: andres.campiglia@ucf.edu

From: Saleh Naser
Sent: Tuesday, August 23, 2016 2:02 PM
To: Andres Campiglia
Cc: Griffith Parks; Saleh Naser
Subject: permission to offer CHM 5305 Applied Biological Chemistry to Biomedical students

Dr. Campiglia,
We are interested in listing CHM 5305 Applied Biological Chemistry (3 cr) in our Biomedical Sciences curricula among recommended courses.

Our students especially those in Metabolic and Cardiovascular Sciences Masters will be interested in this course.

We hope you grant us permission to list CHM 5305 in our elective courses list. A reply of approval to this email will suffice.

Thanks for your support.

Regards,

Saleh

Saleh A. Naser, Ph.D.
Associate Director of Graduate Studies
Professor of Medicine
Burnett School of Biomedical Sciences
University of Central Florida | College of Medicine
Building 20, BMS 136. 4110 Libra Drive. Orlando, FL 32816
Office 407.823.0955 | Fax 407.823.0956 | Lab 407.823.0950
http://med.ucf.edu/biomed/academics/graduate-programs/phd-biomedical-sciences/

Please note: Florida has a very broad open records law (F. S. 119). E-mails may be subject to public disclosure.

From: Jay Hoffman
To: Saleh Naser
Cc: Griffith Parks
Subject: RE: permission to offer PET courses to Biomedical students
Date: Wednesday, August 24, 2016 10:16:48 PM

Saleh,

As we traded messages back and forth today, this is not a problem. Looking forward to further collaboration.

Regards,

Jay

Jay R. Hoffman, Ph.D., FACSM, FNSCA
Director, Institute of Exercise Physiology and Wellness
Chair, Education and Human Sciences
Professor, Sport and Exercise Science
College of Education and Human Performance
Professor of Medicine
Burnett School of Biomedical Science
University of Central Florida

From: Saleh Naser
Sent: Tuesday, August 23, 2016 1:53 PM
To: Jay Hoffman
Cc: Griffith Parks; Saleh Naser
Subject: permission to offer PET courses to Biomedical students

Dr. Hoffman,
We are very interested in listing PET 6366 Exercise, Nutrition, and Weight Control (3 cr) and PET 6388 Cardiovascular Physiology (3 cr) in our Biomedical Sciences curricula as recommended courses.

Our students especially those in Metabolic and Cardiovascular Sciences Masters will be very interested in these course.

We hope you grant us permission to list the two courses in our elective courses list. A reply of approval to this email will suffice.

Thanks for your support.

Regards,

Saleh

Saleh A. Naser, Ph.D.
Associate Director of Graduate Studies

Professor of Medicine
Burnett School of Biomedical Sciences
University of Central Florida | College of Medicine
Building 20, BMS 136. 4110 Libra Drive. Orlando, FL 32816
Office 407.823.0955 | Fax 407.823.0956 | Lab 407.823.0950
http://med.ucf.edu/biomed/academics/graduate-programs/phd-biomedical-sciences/

DraftProposal

METABOLIC and CARDIOVASCULAR SCIENCES (MACS)

Non-thesis track in MS Biomedical Sciences

Burnett School of Biomedical Sciences College of Medicine

Dean: Deborah German
Director: Griffith Parks
Coordinator: Saleh Naser

407-823-0955
Saleh.naser@ucf.edu

Non-thesis METABOLIC and CARDIOVASCULAR SCIENCES track

In MS Biomedical Sciences

Burnett School of Biomedical Sciences; College of Medicine

With new leadership in the Burnett School of Biomedical Sciences (BSBS), there is now a clearer roadmap to advance the academic and research missions In the School, with the goal of becoming a Tier 1 academic/research Institution. The new Director's roadmap for the School includes an emphasis on developing cohesive science-based units that have a shared identity. A cornerstone of this plan involves establishing divisions within BSBS, including Neuroscience, Cancer Biology, Infectious disease, and Metabolic and Cardiovascular Sciences. Academic tracks at the MS and PhD level will play an essential role in this plan, since training and educating graduate students in these focused scientific areas will be drivers in the identity, growth, interactions, and sustainability of each of the departments.

MS Biomedical Sciences:

is a non-thesis broadly based graduate program which we identified as a starting point to execute the BSBS Director's plan.

We plan to develop non-thesis tracks in each of BSBS divisions as follow:

1. Non-thesis MS Neuroscience track: approved in Fall 2015
   30 applications received for Fall 2016
   16 students admitted.
2. Non-thesis MS METABOLIC and CARDIOVASCULAR SCIENCES track:
   proposal under your review
3. Non-thesis MS Infectious Disease track:
   proposal under your review
4. Non-thesis MS Cancer Biology track:
   Proposal in preparation

The new tracks will:

1- provide significant visibility and marketing of COM graduate programs and ultimately recruitment of more quality national/international students.

2- retain many of the UCF students who are seeking professional education following undergraduate graduation.

3- be self-sustained and will not require development of new courses or recruitment of new instructors.

4- solidify and strengthen partnerships with other UCF units including including Computer Science, COHPA and others.

5- form the core from which potential Training Grants and Fellowship Programs can emerge.

6- become a pipeline to the interdisciplinary Biomedical PhD program which should increase the pool of applications and raise the quality of our students.

MS Biomedical Sciences track in METABOLIC and CARDIOVASCULAR SCIENCES (MACS) will focus on educating and training students the area of cardiovascular diseases and metabolic syndrome including Diabetes and obesity as both are the leading cause of morbidity and mortality in the US and around the world. The graduates will be better prepared to meet more specialized growing job market demand.

MS, Biomedical Sciences (Regular Track) Graduate Requirements	**Metabolic and Cardiovascular Sciences track in Biomedical Sciences (MACS) Graduate Requirements**
BSC6432 (BMS Core I), 5 cr	**BSC6432 (BMS Core I), 5 cr**
BSC6433 (BMS Core II), 5 cr	**BSC6433 (BMS Core II), 5 cr**
MCB6938 or IDS7690 (Grad Seminar), 1 cr (Must complete 2x1cr=2cr)	**MCB6938 or IDS7690 (Grad Seminar), 1 cr (Must complete 2x1cr=**
BSC6431 (Practice of Biomed Sci), 3 cr	PCB 5815 Molecular of Obesity, Diabetes and Metabolism(3 cr)
BSC6407C Laboratory Methods in Molecular Biology, 3 cr	**BSC6407C Laboratory Methods in Molecular Biology, 3 cr**
Biomedical Specialization (only 2 courses required) MCB 5225 Molecular Biology of Disease (3 cr) MCB 6226 Molecular Diagnostics (3 cr) PCB 5238 Immunobiology (3 cr) PCB 5236 Cancer Biology (3 cr) PCB 5275 Signal Transduction Mechanisms (3 cr) PCB 5527 Genetic Engineering and Biotechnology (3 cr) PCB 5709C Laboratory Virtual Sim in Physiology (2 cr) PCB 5815 Molec Aspects of Obesity Metabolism (3 cr) PCB 5834C Advanced Human Physiology (4 cr) IDS 5127 Foundation of Bio-Imaging Science (3 cr) BSC 5418 Tissue Engineering (3 cr) GEB 5516 Technological Entrepreneurship (3 cr) Microbiology Specialization (only 2 courses required) Microbiology Specialization (only 2 courses required) MCB 5205 Infectious Processes (3 cr) MCB 5505 Molecular Virology (3 cr) MCB 5208 Cellular Microbiology: Host-Pathogen (3 cr) MCB 5654 Applied Microbiology (3 cr) MCB 6417C Microbial Metabolism (3 cr) MCB 5932 Current Topics in Molecular Biology (3 cr) MCB 5415 Cellular Metabolism (3 cr) MCB 5209 Microbial Stress Response (3 cr) PCB 6595 Regulation of Gene Expression (3 cr) PCB 5235 Molecular Immunology (3 cr)	**Metabolic and Cardiovascular Sciences Track Elective Courses, 12 cr** **Must take at least 4 courses of the following:** • **MCB 5415 Cellular Metabolism (3 cr)** • **PCB 5834C Advanced Human Physiology (4 cr)** • **PCB 5265 Stem Cell Biology (3 cr)** • **CHM 5305 Applied Biological Chemistry (3 cr)** • **BSC 5436 Biomedical Informatics: Structure Analysis (3 cr)** • **BSC 5418 Tissue Engineering (3 cr)** • **PCB 5709C Laboratory Virtual Simulations in Physiology (2 cr)** • **MCB 5225 Molecular Biology of Disease (3 cr)** • **PCB 5709C Laboratory Virtual Simulation in Physiology (2 cr)** • **PET 6366 Exercise, Nutrition, and Weight Control (3 cr)** • **PET 6388 Cardiovascular Physiology (3 cr)** • **Others (must be approved by Program Coordinator)**
MCB6026 Capstone Course, 3 cr Anything in Biomedical sciences	**MCB6026 Capstone Course, 3 cr ONLY in Metabolic and Cardiovascular Sciences**
Pass Oral Comprehensive Exam (Capstone)	**Pass Oral Comprehensive Exam (Capstone)**
Teaching Requirements 2	**Teaching Requirement 1 semester teaching**
Research Shadowing No	**Research Shadowing in Metabolic and Cardiovascular Sciences Optional (1 semester)**
TOTAL CREDITS = 33	TOTAL CREDITS = 33

Burnett School of Biomedical Sciences

College of Medicine

MS BIOMEDICAL SCIENCES PROGRAM

Metabolic and Cardiovascular Sciences" (MACS) Track

PROGRAM DESCRIPTION

The Master of Science in Biomedical Sciences Program *Metabolic and Cardiovascular Sciences" (MACS) Track* is a non-thesis option for students wanting to further their knowledge in the Metabolic and Cardiovascular Sciences field and who may pursue doctoral training or pursue professional education focused on medicine and cardiovascular and metabolic syndromes.

Students interested in research and thesis work should apply to the Master of Science in Biotechnology program.

CURRICULUM

The Biomedical Sciences Metabolic and Cardiovascular Sciences non-thesis program requires a minimum of 33 credit hours of courses that includes a capstone experience. The Program addresses the need of applicants who want to further their knowledge in the Metabolic and Cardiovascular Sciences field and want to pursue doctoral training or professional education with a focus on medicine and related research. Students will take a series of required Core courses, with the remaining courses relevant to Metabolic and cardiovascular sciences and will be required to complete a Capstone project related to the mission of the track.

Non-thesis students are not considered for departmental graduate assistantships or tuition assistance.

NON-THESIS OPTION - 33 Credit Hours minimum

REQUIRED COURSES - 18 Credit Hours

- BSC 6432 Structure-Function-Relationships of Biomedical Sciences I (5 credit hours)
- BSC 6433 Structure-Function-Relationships of Biomedical Sciences II (5 credit hours)
- BSC 6407C Laboratory Methods in Molecular Biology (3 credit hours)
- PCB 5815 Molecular of Obesity, Diabetes and Metabolism (3 cr)
- MCB 6938 Seminar or IDS 7690 Seminar (1 credit hour, to be repeated by all students)

ELECTIVE COURSES - 12 Credit Hours

Non-thesis students must take 12 credit hours of electives listed for Metabolic and Cardiovascular Sciences courses:

Must take at least 4 courses of the following:

- **MCB 5415 Cellular Metabolism (3 cr)**
- **PCB 5834C Advanced Human Physiology (4 cr)**
- **PCB 5265 Stem Cell Biology (3 cr)**
- **CHM 5305 Applied Biological Chemistry (3 cr)**
- **BSC 5436 Biomedical Informatics: Structure Analysis (3 cr)**
- **BSC 5418 Tissue Engineering (3 cr)**
- **PCB 5709C Laboratory Virtual Simulations in Physiology (2 cr)**
- **MCB 5225 Molecular Biology of Disease (3 cr)**
- **PCB 5709C Laboratory Virtual Simulation in Physiology (2 cr)**
- **PET 6366 Exercise, Nutrition, and Weight Control (3 cr)**
- **PET 6388 Cardiovascular Physiology (3 cr)**
- **Others (must be approved by Program Coordinator)**

CAPSTONE -(Metabolic and Cardiovascular Sciences) 3 Credit Hours

- MCB 6026 Capstone Course (3 credit hours minimum)

An in-depth current literature research report in the area of Metabolic and cardiovascular Sciences will be required for each student. The student will select a faculty adviser to chair a faculty committee of three members for evaluation of the report.

An oral presentation on the written capstone report will be used as a final examination. A majority of the Committee must be present for the final examination. Before graduation, the report should be submitted for consideration of publication as a review article in appropriate journals.

LABORATORY OBSERVATION (Optional)

Students are encouraged to spend one semester of research shadowing in the lab of the Capstone project chair.

COMPREHENSIVE EXAM

Non-thesis students must pass an oral comprehensive exam to qualify for the Master of Science degree.

Students must successfully pass an oral comprehensive examination to test the understanding of the basic concepts in the field and relevant applications. The comprehensive examination will be conducted during the capstone defense and will be administered by the capstone committee. Should the student fail this exam, a second opportunity will be provided within 2 weeks of the first attempt. A second failure will result in dismissal from the program.

TEACHING REQUIREMENT

Students without significant prior teaching experience, such as, but not limited to, a minimum of a year in secondary schools or colleges, are required to serve as Classroom Laboratory Assistants (CLA) for a minimum of one semester (one semester in at least one lab section).

INDEPENDENT LEARNING

In the final semester of study, non-thesis students will complete a capstone course that requires an in-depth current literature research report on a relevant subject, which will serve as the independent learning experience. The student will select a faculty adviser to chair a faculty committee of three members for evaluation of the report.

Suggested Choreography

Year1

Fall	Spring	Summer
• BSC 6432 Structure-Function-Relationships of Biomedical Sciences I(5.0) • MCB 6938 Lecture/Seminar (1.0) • MCB 6407C (Laboratory Methods in Molecular Biology) (3.0)	• BSC 6433 Structure-Function-Relationships of Biomedical Sciences II(5.0) • Elective 1 (3.0) • MCB 6938 Lecture/Seminar (1.0)	• Elective 2 (3.0) • MCB 6026 Capstone/Comprehensive Exam (3.0) • Teaching One Lab Section
Semester Total: 9 credit hours	Semester Total: 9 credit hours	Semester Total: 6 credit hours

Year 2

Fall

- PCB 5815 Molecular of Obesity, Diabetes and Metabolism (3 cr)
- Elective 3 (3.0)
- Elective 4 (3.0)
- Teaching One Lab Section

Semester Total: 9 credit hours

Students are required to complete a Plan of Study specifying course degree requirements

College : Medicine
Degree : MS Biomedical Sciences
Track: Metabolic and Cardiovascular Sciences
Department : Molecular Biology and Microbiology
Program Websites : http://biomed.ucf.edu

Memo

To: Requesting faculty

Dr. Deborah German, Dean, UCF College of Medicine

Dr. Griffith Parks, Director, Burnett School of Biomedical Sciences

Dr. Saleh A. Naser, Associate Director, Graduate Affairs

Mrs. Nadine Dexter, Library Director, UCF College of Medicine

Mrs. Ying Zhang, Interim Dept. Head, Acquisitions & Collections

Ms. Mary Page, Assoc. Director, Technical Services

Mr. Barry Baker, Director of Libraries

Dr. John Weishampel, College of Graduate Studies/Undergraduate Studies

Dr. Mubaraek Shah, Interim Vice Provost and Dean, Graduate School

From: Pamela Herring, Electronic Resources Librarian, Harriet F. Ginsburg Health Sciences Library

Subject: Library Evaluation of the Proposal to add Metabolic and Cardiovascular Sciences Non-thesis Track in M.S. in Biomedical Sciences

Date: March 28, 2016

Hereafter, the faculty member requesting the library evaluation should submit the request 6-weeks prior to the due date to allow the library faculty member the adequate time necessary to conduct the evaluation while taking into consideration the librarian's other job responsibilities.

When reviewing library support for a new Metabolic and Cardiovascular Sciences Non-thesis Track in M.S. in Biomedical Sciences, Dr. Saleh Naser and I selected the following institutions for the comparison:

- Duke University (MS, PhD)
- University of South Florida (MS)
- University of Toledo (MS, PhD)

Databases: UCF Libraries' databases support the proposed Master of Science in Biomedical Sciences Program Metabolic and Cardiovascular Sciences Non-thesis Track. The UCF Libraries' database list lacks one database (Embase) held by the majority of the institutions. A description of the database follows the database analysis. When or if the program expands to a Ph.D., it would need to consider subscribing to Embase**.**

Database Cost: $0.00.

If the program expands to a Ph.D. program, the estimated cost of subscribing to **Embase** is **$10,000.00 plus 7% inflation for each year thereafter**

Journals: UCF Libraries' journal holdings list compares favorably with the three institutions chosen for comparison. No additional journals are needed at this time. UCF Libraries is only missing two journals from the journal analysis list: Current Opinion in Lipidology and Microbiology Spectrum. Of those two journals, **Current Opinion in Lipidology** is the only journal all three comparison institutions have. Should this journal be needed, the **estimated cost would be $1,986 + 7% inflation for each year thereafter**.

Journals total costs: $0.00

Books: The analysis of the book collection shows that UCF Libraries compares favorably with the other institutions. Only Duke University has more volumes than UCF.

Books total costs: $ 0.00

Total cost needed to acquire library materials to support the new Metabolic and Cardiovascular Sciences M.S. is $0.00.

See chart below for total cost for the Metabolic and Cardiovascular Sciences Ph.D. per year.

	2016	2017	2018	2019	2020	2021
Databases	**$10,000**	**$10,700**	**$11,449**	**$12,251**	**$13,108**	**$14,026**
Journals	**$1,986**	**$2,125**	**$2,274**	**$2,433**	**$2,603**	**$2,786**
Books	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Total	**$11,986**	**$12,825**	**$13,723**	**$14,684**	**$15,711**	**$16,812**

Summary: While the Metabolic and Cardiovascular Sciences M.S. can be offered at no additional cost for library materials, should the program expand to include a Ph.D. program, the UCF Libraries will need $11,986 for the first year. For costs in subsequent years, see the chart above. After the five-year period, costs will continue so money will need to be added to the Library budget to cover those expenses, especially the subscriptions of databases and journals. In the unfortunate event library budget shortfalls occur, some existing resource subscriptions may be cut or scaled back.

Comparative Analysis on key library resources supporting the new Metabolic and Cardiovascular Sciences M.S.

Databases *(5-10 depending on your needs)*

	UCF	Duke	USF	Toledo
Access Medicine	X	X	X	X
BIOSIS Citation Index	X	X	X	X
BioMed Central	X	X	X	X
BioOne	X	X		
Biotechnology Research Abstracts	X	X	X	
ClinicalKey	X	X		X
Cochrane Library	X	X	X	X
Embase		X	X	X
ERIC	X	X	X	X
NCBI	X		X	X
PsychINFO	X	X	X	X
PubMed/Medline	X	X	X	X
PubMed Central	X			X
Science Direct	X	X	X	X
SciFinder	X	X	X	X
Scopus		X		
SpringerLink	X	X	X	X
Virology and AIDS Abstracts	X		X	
Web of Science	X	X	X	X

Embase increases the discovery of biomedical evidence to support critical life sciences functions, delivering relevant, up-to-date biomedical information to the global biomedical research community. Over 30 million abstracts and indices from published, peer-reviewed biomedical literature, in-press publications and conferences are available on Embase.

Key Journals *(5-10 depending on the needs)*

Journal Titles	UCF	Duke	USF	Toledo
American Heart Journal	X	X	X	X
American Journal of Clinical Nutrition	X	X	X	X
Annual Review of Biochemistry	X	X	X	X
Annual Review of Cell and Developmental Biology	X	X	X	X
Annual Review of Genetics	X	X	X	X
Annual Review of Nutrition	X	X	X	X
Antimicrobial Agents and Chemotherapy	X	X	X	X
Applied and Environmental Microbiology	X	X	X	X
Cell	X	X	X	X
Cell Metabolism	X	X	X	X
Cell Stem Cell	X	X	X	X

Circulation	X	X	X	X
Circulation: Cardiovascular Interventions	X	X	X	X
Circulation: Cardiovascular Quality and Outcomes	X	X	X	X
Circulation Research	X	X	X	X
Clinical and Vaccine Immunology	X	X	X	X
Clinical Microbiology Reviews	X	X	X	X
Current Opinion in Lipidology		X	X	X
EMBO Molecular Medicine	X	X	X	X
Eukaryotic Cell	X	X	X	X
European Heart Journal	X	X	X	X
European Journal of Heart Failure	X	X	X	X
Genome Announcements	X	X	X	X
Genome Research	X	X	X	X
Infection and Immunity	X	X	X	X
International Journal of Obesity	X	X	X	X
JACC: Cardiovascular Interventions	X	X	X	X
Journal of Bacteriology	X	X	X	X
Journal of Clinical Microbiology	X	X	X	X
Journal of Microbiology and Biology Education	X	X	X	X
Journal of Molecular and Cellular Cardiology	X	X	X	X
Journal of the American College of Cardiology	X	X	X	X
Journal of Virology	X	X	X	X
mBio	X	X	X	X
Microbiology and Molecular Biology Reviews	X	X	X	X
Microbiology Spectrum		X		
Molecular and Cellular Biology	X	X	X	X
Molecular Aspects of Medicine	X	X	X	X
Molecular Cell	X	X	X	X
Nature Biotechnology	X	X	X	X
Nature Methods	X	X	X	X
Nature Reviews Genetics	X	X	X	X
Nature Reviews Molecular Cell Biology	X	X	X	X
Nature Structural and Molecular Biology	X	X	X	X
Nutrition Reviews	X	X	X	X
Physiological Reviews	X	X	X	X
Stem Cells	X	X	X	X
Stroke	X	X	X	X
Trends in Biochemical Sciences	X	X	X	X
Trends in Molecular Medicine	X	X	X	X

Journals: The UCF Libraries journal list compares favorably with the chosen institutions. We have the journals needed to support the Metabolic and Cardiovascular Sciences M.S.

PH March 2016

Books *(by the Subject headings, keywords provided or LC ranges).* Limited to year range 2000-2017.

Subjects	UCF	Duke	USF	Toledo
Biological chemistry	583	112	586	134
Cardiology	312	270	353	335
Cell Metabolism	141	86	137	187
Exercise	1,103	1,255	348	304
Human Physiology	764	673	733	153
Human Physiology—Cardiovascular system	10	9	9	2
Metabolism	1,281	1,166	1,112	305
Molecular biology	1,039	1,052	1,248	906
Nutrition	2,123	3,800	1, 242	906
Obesity Metabolism	27	43	31	17
Overweight Prevention & control	6	70	6	6
Stem cells	578	639	515	269
Tissue engineering	161	182	165	73
Weight loss	134	256	83	61
Total books:	**8,262**	**9,613**	**6,568**	**3,658**

Books: The UCF Libraries books subject heading search list compares favorably with the chosen institutions. We have the resources needed to support the Metabolic and Cardiovascular Sciences M.S.

Abbrev: (26 of 30 chars) Adv Ener Eff Nanoelec Devs
Discussion with others: PHY 5704 Physics of Nanoelectronic Devices: Had thorough discussion with Professor Saiful Khondaker to avoid any overlap between the two courses. While PHY 5704 discusses the physics of several nanoelectronic devices, this course would focus on the design and working of the latest technology innovations for minimizing power consumption for future generation electronics.
Rationale: This course is a new elective course for the recently established Professional Science Master's (PSM) and Master of Science programs in Nanotechnology.
Majors taking course: PSM and MS programs in Nanotechnology

IDS 6XXX GRDST-INTERDIS 3(3,0)
Properties of Materials at Nanoscale: PR: Admission to the PSM or MS in Nanotechnology or C.I. Aims to integrate multidisciplinary approaches covering materials science and nanosciences to understand how intrinsic properties of materials are governed by their structural variations at nanoscales. *Spring.*
Abbrev: (30 of 30 chars) Prop of Materials at Nanoscale
Rationale: As the development of new nanomaterials and their application to emerging technologies are progressively changing our daily life, it is very important for students to acquire a basic understanding and knowledge of how/why materials behave differently at nanoscales. This newly developed course aims to integrate multidisciplinary approaches covering materials science and nanosciences to understand how the intrinsic properties of materials are governed by their structural variations, a subject that has not been covered by any existing courses offered from outside the department.
Majors taking course: PSM and MS programs in Nanotechnology, Materials Science

College of Medicine Course Additions

ZOO 5XXX COM-BSBS 3(3,0)
Clinical Embryology and Congenital Malformations: PR: ZOO 3733C or equivalent. Functional human embryology in a clinically oriented way to study the human development and congenital malformations as a result of genetic, environmental and toxic conditions. *Spring, Summer.*
Abbrev: (28 of 30 chars) Clinical Embryology Cong Mal
Rationale: ZOO 4605 Clinical Embryology and Congenital Malformations is an advanced course currently only offered to undergraduate students. We propose to add a graduate section to this course so that it may be included as one of the key elective courses available to students in a new "Integrated Medical Sciences" ("IMS") track that we are developing in our Biomedical Sciences MS (nonthesis) Program. The IMS track is being developed to provide students with an opportunity to enhance their knowledge and skills in preparation for careers in the health sciences professions. Students accepted into this program will take a combination of first-year medical school courses together with graduate courses in biomedical sciences.
Majors taking course: Neuroscience M.S.

ZOO 5XXXC COM-BSBS 4(3,3)

Vertebrate Histology: PR: Graduate standing and college-level Human Anatomy, Human Physiology or Introduction to Histology. Microanatomical detail plus appropriate developmental and functional considerations of major cell types, primary tissues, organs, and organ systems. Survey of modern animal-tissue microtechnique. *Spring.*
Abbrev: (20 of 30 chars) Vertebrate Histology
Rationale: ZOO4753C Vertebrate Histology is an advanced course currently only offered to undergraduate students. We propose to add a graduate section to this course so that it may be included as one of the key elective courses available to students in a new "Integrated Medical Sciences" ("IMS") track that we are developing in our Biomedical Sciences MS (non-thesis) Program. The IMS track is being developed to provide students with an opportunity to enhance their knowledge and skills in preparation for careers in the health sciences professions. Students accepted into this program will take a combination of first-year medical school courses together with graduate courses in biomedical sciences.
Majors taking course: Biomed MS and tracks

MDE 8XXX **COM-MED** **6(6,0)**
Elective in Gynecology: PR: Completion of the M3 year. The Gynecology elective is available to 4th year medical students to acquire a comprehensive experience with commonly treated gynecologic issues for women. The experience will include performing inpatient and emergency gynecologic consultations, attending outpatient clinics, assisting in the operating room with gynecologic cases and participating in following gynecologic patients with breast disorders in the breast clinic. *Spring, Summer, Fall.*
Abbrev: (22 of 30 chars) Elective in Gynecology
Majors taking course: None

MDE 8XXX **COM-MED** **6(6,0)**
Obstetrics and Gynecology Ambulatory Elective: PR: Completion of the M3 year. The Ob/Gyn Ambulatory elective is available to 4th year medical students to acquire a comprehensive experience in obstetrics and gynecology. The experience will be both outpatient and inpatient and include participation in all aspects of care for women. The student will participate in obstetric and gynecologic consultations, attending outpatient clinics, assisting in the operating room with obstetric and gynecologic cases, and participating in pre-op and post-op care. *Spring, Summer, Fall.*
Abbrev: (26 of 30 chars) Ob/Gyn Ambulatory Elective
Majors taking course: none

MDE 8XXX **COM-MED** **6(6,0)**
Pediatric Anesthesia Elective: PR: Completion of the M3 year. This two- or four-week elective rotation, open to fourth year medical students, will provide a broad learning experience in pediatric anesthesiology. *Spring, Summer, Fall.*
Abbrev: (24 of 30 chars) Peds Anesthesia Elective
Majors taking course: none

MDE 8XXX **COM-MED** **6(6,0)**

UNIVERSITY OF CENTRAL FLORIDA
COLLEGE OF GRADUATE STUDIES

NEW FORM – BEGINNING FALL 2015

Program Recommendation Form - REVISIONS ONLY

This form is to be used to **REVISE** degree programs, tracks, or certificate programs. If there are changes to a program and the changes will also affect the program tracks, one form may be used for both the program and the track(s).

Please refer to the Graduate Council Curriculum Meeting Schedule for submission deadlines.

Checklist of items to be attached with completed form:

☐ Complete and current Graduate Catalog copy (www.graduatecatalog.ucf.edu), including description, curriculum, contact information, application requirements, and application deadlines. Use Track Changes in Word to show revisions.

☐ A list of faculty who will participate in the program, track or certificate and their credentials.

☐ All course action requests that will be needed to implement the curriculum changes.

☐ If applicable, a written agreement from all involved units that they are in support of the revisions.

College/Unit(s) Submitting Proposal: College of Engineering and Computer Science

Proposed Effective Term/Year: Spring 2017

Unit(s) Housing Program: Department of Computer Science

Name of program, track and/or certificate: Computer Forensics Graduate Certificate

Please check all that apply: This action affects a: ☐ Program ☐ Track ☑ Certificate

If the revision applies to multiple tracks, please list them here:

Brief description of **program and rationale** of the revision: **Do not add complete catalog copy here.**

We propose to move the Computer Forensics Graduate Certificate from the Chemistry Department in the College of Sciences to the Computer Science Department in the College of Engineering and Computer Science.

The CS department currently hosts and administrates the Digital Forensics MS program (MSDF). The Computer Forensics Certificate is a sub-plan of the MSDF program, and currently it is also administrated by Dr. Cliff Zou, the program coordinator of MSDF program. This revision will streamline the administrative tasks and eliminate potential confusion to students.

Briefly list curriculum changes in bullet format. If there are changes to the credit hours of the program, required courses or other requirements, please state those changes. **Remember to attach the catalog copy showing changes, using Track Changes in Word.**

The Computer Forensics Graduate Certificate program will not have any program change. Specifically, the Chemistry course CHS 5504 (Topics in Forensic Science) will be kept in the required course list of the certificate. The Chemistry Department is in approval of transferring the certificate program to Computer Science. In her email to Dr. Cliff Zou, Dr. Cherie Yestrebsky (Chemistry Interim Chair) indicated that Dr. Mike Sigman and the Dean's office all approve the transfer as long as the course CHS 5504 will be kept in the program of study.

Name Change

Are you changing the name of an existing program, track, or certificate? ☐ Yes ☑ No

If yes, provide the new name of the program, track, or certificate: _____

A proposed name change will apply to the record of all students who are currently enrolled, readmitted or newly admitted into this program as of the effective date of this change.

Impact on Current Students

Will students be moved from an existing program, track, or certificate into this new program, track, or certificate? ☐ Yes ☑ No

If yes, state the name of the program or track where students are currently enrolled and attach a list of students if possible:

Will students have the option to stay in their existing program, track, or certificate? ☐ Yes ☐ No

If yes, how will current students be impacted by this change?

If there are substantial revisions, please complete the following table on financial support: (Specify all forms of support – assistantships, fellowships, and tuition remission.)

	Number of assistantship students	Source of funds	Number of fellowship students (specify fellowship)	Number of tuition remissions	Source of funds
Year 1					
Year 2					
Year 3					

Signature Page

Recommend Approval (all approval levels must be signed)

Graduate Faculty Program Coordinator (Print) Cliff Zou (Signature) _____ Date 05/17/16

Department Chair /Director (Print) Gary T. Leavens (Signature) Gary T. Leavens cn=Gary T. Leavens, l=US, ou=UCF Computer Science, ou=Computer Science, email=t.leavens@ucf.edu, c=United States, givenName=Gary T. Leavens 2016.06.06 18:14:03 -04'00' Date 06/06/2016

College Academic Standards (Print) Mostafa Bassiouni (Signature) M. Bassiouni Digitally signed by Mostafa Bassiouni DN: cn=Mostafa Bassiouni, o=University of Central Florida, ou=College of Engineering and Computer Science, email=bassiouni@ucf.edu, c=US Date: 2016.06.10 15:41:57 -04'00' Date 06/10/2016

College Dean (Print) Michael Georgiopoulos (Signature) _____ Date 06/10/2016

Graduate Council (Print) _____ (Signature) _____ Date _____

Graduate Dean (Print) _____ (Signature) _____ Date _____

Approval

Provost and Executive Vice President: _____ Date _____

Distribution: After approval is received from the Provost, distribution will be to:

Department(s); College; Registrar; Associate Registrar; Institutional Knowledge Management; Academic Services; College of Graduate Studies

From: "Cliff C. Zou" <czou@cs.ucf.edu>
To: "M. Bassiouni" <bassi@cs.ucf.edu>
Sent: Wednesday, June 1, 2016 8:29:12 PM
Subject: Fwd: Re: Computer Forensics Certificate Program

Dr. Yestrebsky has approved the movement of certificate program on computer forensics.

best,
cliff,

---------- Forwarded message ----------
From: Cherie Yestrebsky <Cherie.Yestrebsky@ucf.edu>
To: "czou@cs.ucf.edu" <czou@cs.ucf.edu>
Subject: Re: Computer Forensics Certificate Program
Date: Wed, 1 Jun 2016 22:09:41 +0000

Ok. Let me know if you need anything else from this end.
Best wishes
Cherie

> On Jun 1, 2016, at 5:56 PM, Cliff C. Zou <czou@cs.ucf.edu> wrote:
>
> Hi, Dr. Yestrebsky:
>
> Yeah, the certificate program will not have any program change, and the CHS5504 will be kept in the required course list. Thanks.
>
> best,
> cliff,
>
>> On Jun 1 2016, Cherie Yestrebsky wrote:
>>
>> Hi Cliff, Thank you for the email and allowing me a bit of time to respond. I wanted to check with Mike Sigman and the Dean's office before replying. We are agreeable to this move if we can get an MOU that the certificate program will keep the 'Topics in Forensic Science' course (CHS 5504) in the program of study. Let me know if you are in agreement with this and then we can move ahead with transferring this program to CS. Best regards, Cherie
>>
>> ----------
>> From: cliff.zou@gmail.com [mailto:cliff.zou@gmail.com] On Behalf Of Cliff Zou Sent: Friday, May 20, 2016 9:55 PM To: Cherie Yestrebsky <Cherie.Yestrebsky@ucf.edu> Subject: Fwd: Computer Forensics Certificate Program
>>

>> Hi, Dr. Yestrebsky:
>>
>> I'm Dr. Cliff Zou, an associate professor from Computer Science department, and is also the program coordinator for Digital Forensic MS program. Since I'm the coordinator for the Computer Forensics Certificate program but this program is currently in Chemistry department, I have sent a request to our college requesting to move this certificate program to CS department for simplified administration reason. Our College's Associate Dean, Dr. Bassiouni, in the following email asking me to get approval from your department. Could you help me in this process?
>>
>> Thanks!
>> best,
>> cliff,
>>
>>
>> On Tue, May 17, 2016 at 11:32 AM, M. Bassiouni <bassi@cs.ucf.edu<mailto:bassi@cs.ucf.edu>> wrote: Thank you Cliff, but communications with the Chemistry Department is essential to get their approval. We need to document by email that they are in support of the move. Normally the program graduate coordinator contacts his counterpart in the other program (Sheau-Dong Lang may help in providing contact names or Gary may help in contacting the chair). Please keep me posted about your communications. If needed, I will seek the approval of COS Associate Dean but that comes at a later stage after securing program approval.
>>
>>
>>
>> _____

From: "Cliff C. Zou" <czou@cs.ucf.edu<mailto:czou@cs.ucf.edu>> To: "M. Bassiouni" <bassi@cs.ucf.edu<mailto:bassi@cs.ucf.edu>> Cc: "Gary Leavens" <leavens@eecs.ucf.edu<mailto:leavens@eecs.ucf.edu>>, "Kim Small" <kim.small@ucf.edu<mailto:kim.small@ucf.edu>>, "Heather Houser" <hstevens@ucf.edu<mailto:hstevens@ucf.edu>>, "Paul Edlen" <paul.edlen@ucf.edu<mailto:paul.edlen@ucf.edu>> Sent: Tuesday, May 17, 2016 11:04:49 AM Subject: Re: Computer Forensics Certificate Program
>>
>> Hi, Dr. Bassiouni:
>> Attached is the form filled and signed by me. Thanks!
>> best,
>> cliff,
>>
>> On Tue, May 17, 2016 at 10:20 AM, M. Bassiouni <bassi@cs.ucf.edu<mailto:bassi@cs.ucf.edu>> wrote: Hi Cliff
>>
>> I am supportive of your request to move the Computer Forensics Certificate Program to CS.

>>
>> Please initiate the request to move the Computer Forensics Certificate Program from COS-Chemistry to CECS-Computer Science. Follow the instructions in Debra's message below. Once you and Gary sign the form, I will get college approval and the dean's signature. There is no need to get the approval of GPCC on this request.
>>
>> Please let me know if you have any questions.
>>
>> Regards,
>>
>> Mostafa Bassiouni / Bassi
>>
>> _____

From: "Debra Winter" <Debra.Winter@ucf.edu<mailto:Debra.Winter@ucf.edu>> To: "M. Bassiouni" <bassi@cs.ucf.edu<mailto:bassi@cs.ucf.edu>> Cc: "John Weishampel" <John.Weishampel@ucf.edu<mailto:John.Weishampel@ucf.edu>>, "Jana Jasinski" <Jana.Jasinski@ucf.edu<mailto:Jana.Jasinski@ucf.edu>>, "Rhonda Nelson" <Rhonda.Nelson@ucf.edu<mailto:Rhonda.Nelson@ucf.edu>>, "Robin Mccormick" <Robin.Mccormick@ucf.edu<mailto:Robin.Mccormick@ucf.edu>> Sent: Tuesday, May 17, 2016 9:58:20 AM Subject: RE: Computer Forensics Certificate Program
>>
>> Good morning, Dr. Bassiouni,
>>
>> To move the Computer Forensics Graduate Certificate from the Chemistry Department in the College of Sciences to the Computer Science Department in the College of Engineering and Computer Science, please complete the attached Program Recommendation Form (Revisions) and send it to Dr. Weishampel. The request will need to be reviewed by the Graduate Council Curriculum Committee in Fall 2016 and you can use Spring 2017 as the start term for the revisions.
>>
>> Along with the completed form, please also include communication with the College of Sciences that shows they are in support of the revisions. If there are any courses that must be moved that are part of the certificate's curriculum, please include instructions for them as well.
>>
>> Thanks,
>> Debra
>>
>> Debra Winter, PhD Director, Communications UCF College of Graduate Studies Debra.Winter@ucf.edu<mailto:Debra.Winter@ucf.edu> or 407-823-3567<tel:407-823-3567>
>>

>> --
>> Cliff C. Zou

>> Associate Professor
>> Program Coordinator of Master of Science in Digital Forensics
>> Department of Computer Science
>> University of Central Florida
>> 4000 Central Florida Blvd., HEC-243
>> Orlando, FL 32816-2362
>> http://www.cs.ucf.edu/~czou/
>>
--

Mostafa Bassiouni, Professor
Department of Computer Science, Room HEC-307
College of Engineering and Computer Science
University of Central Florida
Orlando, Florida 32816 USA
Phone: (407) 823-2837
Email: bassi@cs.ucf.edu
Web Profile: http://www.cs.ucf.edu/people/profiles.php?id=2
Web Page: http://www.cs.ucf.edu/~bassi

Computer Forensics Graduate Certificate

Program TRACKS

Out of State Cohort

College : Sciences	**Degree** :CRT
Department : Chemistry	**Option** : N/A
Program Websites : http://gccf.ucf.edu/	

CURRICULUM

The Computer Forensics certificate requires four graduate courses (12 credit hours) in forensics study.

Total Credit Hours Required:
12 Credit Hours Minimum beyond the Bachelor's Degree

Required Courses—12 Credit Hours

- CHS 5504 Topics in Forensic Science (3 credit hours)
- CHS 5518 The Forensic Collection and Examination of Digital Evidence (3 credit hours) or CHS 5596 The Forensic Expert in the Courtroom (3 credit hours)
- CGS 5131 Computer Forensics I: Seizure and Examination of Computer Systems (3 credit hours)
- CNT 6418 Computer Forensics II: Network Security, Intrusion Detection, and Forensic Analysis (3 credit hours)

Note: A graduate-level digital evidence course approved by the graduate program director may be used to substitute for CGS 5131 or CNT 6418.

Contact INFO

Request Information

Graduate Program

Cliff Zou PhD
Associate Professor
CZou@cs.ucf.edu
Telephone: 407-823-5015
HEC 243 Map

Graduate Admissions

Computer Forensics Graduate Certificate

Out of State Cohort Track

Program TRACKS

Out of State Cohort

College : Sciences	**Degree** :CRT
Department : Chemistry	**Option** : N/A
Program Websites : http://gccf.ucf.edu/	

CURRICULUM

The Computer Forensics certificate requires four graduate courses (12 credit hours) in forensics study.

Total Credit Hours Required:
15 Credit Hours Minimum beyond the Bachelor's Degree

Required Courses—12 Credit Hours

- CHS 5504 Topics in Forensic Science (3 credit hours)
- CHS 5518 The Forensic Collection and Examination of Digital Evidence (3 credit hours) or CHS 5596 The Forensic Expert in the Courtroom (3 credit hours)
- CGS 5131 Computer Forensics I: Seizure and Examination of Computer Systems (3 credit hours)
- CNT 6418 Computer Forensics II: Network Security, Intrusion Detection, and Forensic Analysis (3 credit hours)

Elective Courses—3 Credit Hours

Choose one course from the following list:

- CIS 6207 The Practice of Digital Forensics (3 credit hours)
- CAP 6133 Advanced Topics in Computer Security and Computer Forensics (3 credit hours)

Cost Per Credit Hour

For the Computer Forensics Cohort Certificate, the cost per credit hour is $333.*

*Fee is subject to change.

Contact INFO

Request Information

UNIVERSITY OF CENTRAL FLORIDA
COLLEGE OF GRADUATE STUDIES

NEW FORM – BEGINNING FALL 2015

Program Recommendation Form - REVISIONS ONLY

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Please refer to the Graduate Council Curriculum Meeting Schedule for submission deadlines.

Checklist of items to be attached with completed form:

☐ Complete and current Graduate Catalog copy (www.graduatecatalog.ucf.edu), including description, curriculum, contact information, application requirements, and application deadlines. Use Track Changes in Word to show revisions.

☐ A list of faculty who will participate in the program, track or certificate and their credentials.

☐ All course action requests that will be needed to implement the curriculum changes.

☐ If applicable, a written agreement from all involved units that they are in support of the revisions.

College/Unit(s) Submitting Proposal: CECS/Computer Science Department

Proposed Effective Term/Year: Spring 2017

Unit(s) Housing Program:

Name of program, track and/or certificate: Accelerated BS to MS track in Computer Science

Please check all that apply: This action affects a: ☑ Program ☐ Track ☐ Certificate

If the revision applies to multiple tracks, please list them here:

Brief description of **program and rationale** of the revision: **Do not add complete catalog copy here.**

The accelerated BS to MS program in the Computer Science Department allows highly qualified undergraduate CS students to take graduate-level courses that will count towards their MS degree while completing their BS degree program. This revision corrects the original classification of the program started in 2006/2007 as an undergraduate rather than a graduate program.

Briefly list curriculum changes in bullet format. If there are changes to the credit hours of the program, required courses or other requirements, please state those changes. **Remember to attach the catalog copy showing changes, using Track Changes in Word.**

No curriculum changes.

Name Change

Are you changing the name of an existing program, track, or certificate? ☐ Yes ☑ No

If yes, provide the new name of the program, track, or certificate: _____

A proposed name change will apply to the record of all students who are currently enrolled, readmitted or newly admitted into this program as of the effective date of this change.

Impact on Current Students

Will students be moved from an existing program, track, or certificate into this new program, track, or certificate? ☐ Yes ☑ No

If yes, state the name of the program or track where students are currently enrolled and attach a list of students if possible:

_____

Will students have the option to stay in their existing program, track, or certificate? ☐ Yes ☐ No

If yes, how will current students be impacted by this change?

If there are substantial revisions, please complete the following table on financial support: (Specify all forms of support – assistantships, fellowships, and tuition remission.)

	Number of assistantship students	Source of funds	Number of fellowship students (specify fellowship)	Number of tuition remissions	Source of funds
Year 1					
Year 2					
Year 3					

Signature Page

Recommend Approval (all approval levels must be signed)

Department Chair /Director (Print) Gary T. Leavens (Signature) Gary T. Leavens cn=Gary T. Leavens, l=US, o=UCF Computer Science, ou=Computer Science, email=Leavens@ucf.edu, c=United States, givenName=Gary T. Leavens 2016.08.29 14:17:17 -04'00' **Date** 08/29/2016

College Academic Standards (Print) Mostafa Bassiouni (Signature) M. Bas **Date** 08/30/2016

College Dean (Print) Michael Georgiopoulos (Signature) **Date** 09/01/2016

Graduate Council (Print) _____ (Signature) _____ **Date** _____

Graduate Dean (Print) _____ (Signature) _____ **Date** _____

Approval

Provost and Executive Vice President: _____ **Date** _____

Distribution: After approval is received from the Provost, distribution will be to:

Department(s); College; Registrar; Associate Registrar; Institutional Knowledge Management; Academic Services; College of Graduate Studies

Track Description

The accelerated BS to MS program in Computer Science allows highly qualified UCF undergraduate majors in Computer Science to take graduate-level courses that will count toward their MS degree while completing their BS degree program.

Curriculum

The BS degree in Computer Science is awarded after completing university requirements for the degree, including 120 undergraduate credit hours as defined in the Undergraduate Catalog. Courses designated in the General Education Program and Common Program Prerequisites follow the general engineering major requirements and are usually completed in the first 60 hours (see engineering major requirements in the Undergraduate Catalog).

The master's program requires 30 credit hours beyond the bachelor's degree and offers thesis and nonthesis options. The MS degree in Computer Science is awarded upon completion of the master's program.

Up to 12 credit hours of 5000- and 6000-level courses with a grade "B" (3.0) or better may be counted toward the accelerated BS to MS program. Two additional requirements for the students in this program are:

1. Students must earn at least a "B" (3.0) in each undergraduate- or graduate-level course counted for the program.
2. Students must opt for this program no later than the beginning of their Junior year.

Undergraduate Requirements

See the current version of the Undergraduate Catalog and the College of Engineering and Computer Science website for additional requirements for accelerated programs.

Graduate Requirements

For the thesis option, students must take at least 18 credit hours beyond the 12 credit hours counted toward the undergraduate degree and include 6 credit hours of thesis. For both the thesis and nonthesis options, the 18 credit hours need to include

- CDA 5106 and COT 5405, both with a grade of "B" (3.0) or better (6 credit hours)
- Any approved pair of Computer Science courses (a 5000/6000 pair) in a single area of discourse, both with a grade of "B" (3.0) or better (6 credit hours)

Plan of Study

The Plan/Program of Study (POS) is an agreement between the student, the program and the University that lists the coursework taken to satisfy the requirements for completing the degree. The POS for students is flexible and unique to each student. However, it must meet university, college, and department rules for minimum number of hours, etc.

All graduate students must have a Plan of Study (POS) on file, approved by the adviser and graduate coordinator, by the completion of 9 credit hours after entering the program. The College of Graduate Studies automatically places a "hold" on future registration for noncompliance. The default adviser for nonthesis MS students is the Graduate Coordinator.

Application Requirements

For information on general UCF graduate admissions requirements that apply to all prospective students, please visit the Admissions section of the Graduate Catalog. Applicants must apply online and all required documents must be submitted by the established deadline.

Students may apply for admission to the accelerated program *only after passing the Foundation Exam in either their sophomore or junior year.* The application should be done directly through the College of Engineering and Computer Science. If accepted and ready to enroll as a full-time graduate student in the Computer Science MS program, the student must submit the University Graduate application.

In addition to the general UCF graduate application requirements, applicants to this program must provide:

- One official transcript (in a sealed envelope) from each college/university attended.
- Official, competitive GRE score taken within the last five years.
- Resume
- Letters of recommendation (encouraged but not required)

Application Deadlines

Fall Priority – January 15
Fall - July 15
Spring – December 1
Summer – April 15

UNIVERSITY OF CENTRAL FLORIDA
COLLEGE OF GRADUATE STUDIES

NEW FORM – BEGINNING FALL 2015

Program Recommendation Form - REVISIONS ONLY

This form is to be used to **REVISE** degree programs, tracks, or certificate programs. If there are changes to a program and the changes will also affect the program tracks, one form may be used for both the program and the track(s).

Please refer to the Graduate Council Curriculum Meeting Schedule for submission deadlines.

Checklist of items to be attached with completed form:

☑ Complete and current Graduate Catalog copy (www.graduatecatalog.ucf.edu), including description, curriculum, contact information, application requirements, and application deadlines. Use Track Changes in Word to show revisions.

☐ A list of faculty who will participate in the program, track or certificate and their credentials.

☑ All course action requests that will be needed to implement the curriculum changes.

☐ If applicable, a written agreement from all involved units that they are in support of the revisions.

College/Unit(s) Submitting Proposal: COM—BSBS

Proposed Effective Term/Year: Immediately

Unit(s) Housing Program: Burnett School of Biomedical Sciences

Name of program, track and/or certificate: Cancer Biology Track in MS Biomedical Sciences

Please check all that apply: This action affects a: ☐ Program ☑ Track ☐ Certificate

If the revision applies to multiple tracks, please list them here:

Brief description of **program and rationale** of the revision: **Do not add complete catalog copy here.**

The Modeling and Simulation (M&S) MS program is intended to expose students to M&S techniques as tools for understanding and researching different areas of focus. This program revision is proposed to add a new core course to ensure that students can properly identify and utilize the most common simulation techniques. Upon increasing the core requirements by one course, the elective requirements will be decreased by the same amount in order to keep the total program hours unchanged. The elective requirement will also be further defined for the non-thesis option.

Adding this specific core course is recommended based on feedback from external consultants that was part of our recent 7-year academic program review. It reflects the growing need to ensure students are knowledgeable of the most common simulation techniques.

The overall credit hours for the program (30hrs) will not be changed.

Briefly list curriculum changes in bullet format. If there are changes to the credit hours of the program, required courses or other requirements, please state those changes. **Remember to attach the catalog copy showing changes, using Track Changes in Word.**

A revision to the Modeling and Simulation MS is proposed to increase the core requirements by one course and decrease the elective requirement by the same amount while further defining the non-thesis elective requirement. These changes are outlined below:

* Core: Currently require 12 credit hours; propose increase to 15 credit hours.
  * New course IDS 6XXX Simulation Techniques will be added as a requirement for MS degree (regardless of thesis or non-thesis option).
  * Thesis option will require new course IDS 6XXX Research Design for M&S instead of previously required IDS 6916 Practicum
  * Non-thesis option will continue requirement of IDS 6916 Practicum

* Electives: Reduce by 3 credit hours for thesis and non-thesis options.
  * Thesis option will now require 9hrs of unrestricted electives (instead of 12hrs) + same requirement of 6hrs of thesis. No change to composition of elective choices.
  * Non-thesis option will now require 15hrs of electives instead of 18hrs. These 15hrs will be further defined to require at least one restricted M&S elective (3hrs), while the remaining 12hrs will remain unrestricted pending advisor and program director approval. This will be monitored by the M&S Graduate Program Office.

Name Change

Are you changing the name of an existing program, track, or certificate? ☐ Yes ☑ No

If yes, provide the new name of the program, track, or certificate: n/a

A proposed name change will apply to the record of all students who are currently enrolled, readmitted or newly admitted into this program as of the effective date of this change.

Impact on Current Students

Will students be moved from an existing program, track, or certificate into this new program, track, or certificate? ☐ Yes ☐ No

If yes, state the name of the program or track where students are currently enrolled and attach a list of students if possible:

Students enrolled in MS Biomedical Sciences may choose to select Cancer Biology Track.

Will students have the option to stay in their existing program, track, or certificate? ☐ Yes ☐ No

If yes, how will current students be impacted by this change?

This change will impact new, incoming students admitted for Fall 2016.

Existing students with previous catalog years will have the option to move to this updated curriculum if they wish to do so, but it will not be required of them.

If there are substantial revisions, please complete the following table on financial support: (Specify all forms of support – assistantships, fellowships, and tuition remission.)

	Number of assistantship students	Source of funds	Number of fellowship students (specify fellowship)	Number of tuition remissions	Source of funds
Year 1	No		No	No	
Year 2	No		No	No	
Year 3	No		No	No	

Signature Page

Recommend Approval (all approval levels must be signed)

Graduate Faculty Program Coordinator (Print) Joseph J. LaViola (Signature) _____ Date 6/14/2016

Department Chair /Director (Print) Randall Shumaker (Signature) _____ Date 6/15/2016

College Academic Standards (Print) _____ (Signature) _____ Date _____

College Dean (Print) _____ (Signature) _____ Date _____

Graduate Council (Print) _____ (Signature) _____ Date _____

Graduate Dean (Print) _____ (Signature) _____ Date _____

Approval

Provost and Executive Vice President: _____ Date _____

Distribution: After approval is received from the Provost, distribution will be to:

Department(s); College; Registrar; Associate Registrar; Institutional Knowledge Management; Academic Services; College of Graduate Studies

Modeling and Simulation MS

College : Graduate Studies	**Degree :**XMA
Department :	**Option :** Thesis, Nonthesis
Program Websites : http://www.ist.ucf.edu/grad/index.html	

PROGRAM DESCRIPTION

Simulation is the quintessential utility tool. In one way or another, just about every engineering or scientific field uses simulation as an exploration, modeling, or analysis technique. Simulation is not limited to engineering or science. Simulation is used in training, management, and concept exploration and involves constructing human-centered, equipment-centered, and/or stand-alone computer-based models of existing as well as conceptual systems or processes. The purpose of simulation is to evaluate the behavior of the human, organization, equipment, and/or systems under study through the evaluation of output from the corresponding simulation construct. Because of the scale and complexity of modeling and simulation, practitioners have developed both generalized and specialized skills.

Show Program Description

CURRICULUM

The Modeling and Simulation Master of Science program requires a minimum of 30 credit hours beyond the bachelor's degree.

The M&S MS program offers a thesis option and a nonthesis option. Each option requires ~~12~~ 15 credit hours of required core courses.

- Students who select the thesis option must take ~~12~~ 9 credit hours of unrestricted electives and 6 thesis credit hours.
- Students who select the nonthesis option must take ~~18~~ 3 credit hours of restricted electives and 12 credit hours of unrestricted electives.

The culminating experience for thesis-option students in the MS program is the final thesis document and the oral defense of the thesis research.

The culminating, capstone experience for nonthesis students is a technical project, which requires a written and oral presentation of the work, completed as part of the required core course IDS 6916 Simulation Research Methods and Practicum. This project is reviewed by panel experts.

Total Credit Hours Required:
30 Credit Hours Minimum beyond the Bachelor's Degree

Required Courses—~~12~~ 15 Credit Hours

Core—~~12~~ 15 Credit Hours

Core courses provide an interdisciplinary framework for all Modeling and Simulation students. Teams of Modeling and Simulation program faculty teach these core courses. Course descriptions can be found in the Catalog Menu at the top of the page under the heading "Courses."

- IDS 6147 Perspectives on Modeling and Simulation (3 credit hours)
- DIG 5876 Quantitative Aspects of Modeling and Simulation (3 credit hours) ~~or an advanced higher level quantitative course as approved by the Graduate Program Director~~
- IDS 6148 Human Systems Integration for Modeling and Simulation (3 credit hours) or EIN 6258 Human Computer Interaction (3 credit hours) or EXP 6541 Advanced Human-Computer Interaction (3 credit hours)
- IDS 6XXX Simulation Techniques (3 credit hours)
- Thesis Option: IDS 6XXX Research Design for Modeling and Simulation (3 credit hours)
- Nonthesis Option: IDS 6916 Simulation Research Methods and Practicum (3 credit hours)

Unrestricted Electives—~~12~~ 9 Credit Hours

All Modeling and Simulation MS students must take at least ~~12~~ 9 credit hours of unrestricted electives that support the student's area of graduate study. Unrestricted electives must consist of at least ~~12~~ 9 credit hours of formal courses, which may include independent study (up to 6 credit hours). The remaining credit may consist of additional thesis (for thesis option students only), directed research, and additional courses as advised appropriately by the faculty adviser and/or program director.

Thesis Option—6 Credit Hours

Thesis students are required to take an additional 6 credit hours of thesis.

- IDS 6971 Thesis (6 credit hours)

Nonthesis Option—6 Credit Hours

Restricted Elective – 3 Credit Hours

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Nonthesis students must select an elective course from the Modeling and Simulation Graduate Program. Appropriate courses include those that follow. Others may be added over time with Program Director approval.

- IDC 5602 Cybersecurity: A Multidisciplinary Approach (3 credit hours)
- IDC 6601 Behavioral Aspects of Cybersecurity (3 credit hours)
- IDC 6700 Interdisciplinary Approach to Data Visualization (3 credit hours)
- IDS 5XXX Instructional Design for Modeling and Simulation (3 credit hours)
- IDS 6146 Modeling and Simulation Systems (3 credit hours)
- IDS 6149 Modeling and Simulation for Test and Evaluation (3 credit hours)
- IDS 6916 Simulation Research Methods and Practicum (3 credit hours)
- IDS 6938 Intelligent Tutoring System (ITS) Design (3 credit hours)

Unrestricted Elective – 3 Credit Hours

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Nonthesis students are required to take an additional ~~6~~3 credit hours of unrestricted electives that support the student's area of graduate study.

Participating Faculty

Attachment for Program Recommendation Form

Faculty Teaching Core Courses:

- Patricia Bockelman Morrow, Ph.D.
- R. Paul Wiegand, Ph.D.
- Joseph Kider, Ph.D.
- Pamela Douglas, Ph.D.

Graduate Faculty:

(Taken from the UCF Graduate Catalog as of June 8, 2016 - http://graduatecatalog.ucf.edu/GradFaculty/)

- Abdel-Aty, Mohamed
- Al-Deek, Haitham
- Barber, Daniel
- Bowers, Clint
- Chin, Matthew
- Cooper, David
- Fiore, Stephen
- Garibay, Ivan
- Goldiez, Brian
- Gonzalez, Avelino
- Hancock, Peter
- Hirumi, Atsusi
- Hughes, Charles
- Jentsch, Florian
- Karwowski, Waldemar
- Kaup, David
- Khaled, Annette
- Kincaid, Peter
- Lackey, Stephanie
- Laviola II, Joseph
- Martin, Glenn
- Matthews, Gerald
- McCauley, Pamela
- McDaniel, Rudy
- Mollaghasemi, Mansooreh
- Morrow, Patricia Bockelman
- Pensky, Marianna
- Proctor, Michael
- Rabelo, Luis
- Radwan, Essam
- Reilly, Chuck
- Reinerman, Lauren
- Salas, Eduardo
- Schott, Jim
- Sepulveda, Jose
- Shumaker, Randall
- Sims, Valerie
- Smith, Peter
- Wang, Morgan
- Weishampel, John
- Wiegand, Paul
- Wu, Annie

Graduate Faculty Scholars:

(Taken from the UCF Graduate Catalog as of June 8, 2016 - http://graduatecatalog.ucf.edu/GradFaculty/scholar.aspx)

- Abich, Julian
- Akbas, Ilhan
- Allen, Christine
- Andrews, Anya
- Bailenson, Jeremy
- Berman, Stephen
- Blumberg, Fran
- Boustique, Hatim
- Burgess, Deborah
- Cannon-Bowers, Janis
- Cuty Ruiz, Laura
- deWinter, Jennifer
- Divo, Eduardo *
- Dwyer, Daniel
- Everett, George
- Fidopiastis, Cali
- Finch, Craig
- Funke, Gregory
- Gallagher, Shaun
- Gerber, Matthew
- Gilson, Richard
- Goldberg, Stephen
- Graniela Ortiz, Benito
- Griego, Regina
- Cho, Hyoung
- Jaganathan, Sivakumar
- Keebler, Joseph
- Lang, Sheau-Dong
- Lemacks, Jennifer
- Leonessa, Alexander
- Lindgren, Robb
- Lisle, Curtis
- Liu, Alan
- Maraj, Crystal
- Maxwell, Douglas
- Metcalf, David
- Misquitta, Leonie
- Mohammad, Syed
- Mondesire, Sean
- Morgan, Justin
- Morie, Jacquelyn
- Morris, Cliff
- Moshell, Michael
- Muhs, Tammy
- Nagendran, Arjun
- Ness, James
- Neville, Kelly
- Nicholson, Denise
- Panganiban Fallon, April
- Quijada, Sergio
- Rehman, Zia
- Salcedo, Julie
- Schatz, Sae
- Smith, Roger

- Sotomayor, Teresita
- Sottilare, Robert
- Stevens, Jonathan
- Talbot, Brett
- Taylor, Grant
- Taylor, Gregory
- Ullrich, Andreas
- VanderVeen, Cornelius
- Vogel-Walcutt, Jennifer
- Whitmire, James
- Williams, Kent
- Wittman, Robert LeRoy
- Yonekura, Francisca

UNIVERSITY OF CENTRAL FLORIDA
COLLEGE OF GRADUATE STUDIES

NEW FORM – BEGINNING FALL 2015

Program Recommendation Form - REVISIONS ONLY

This form is to be used to **REVISE** degree programs, tracks, or certificate programs. If there are changes to a program and the changes will also affect the program tracks, one form may be used for both the program and the track(s).

Please refer to the Graduate Council Curriculum Meeting Schedule for submission deadlines.

Checklist of items to be attached with completed form:

☑ Complete and current Graduate Catalog copy (www.graduatecatalog.ucf.edu), including description, curriculum, contact information, application requirements, and application deadlines. Use Track Changes in Word to show revisions.

☐ A list of faculty who will participate in the program, track or certificate and their credentials.

☑ All course action requests that will be needed to implement the curriculum changes.

☐ If applicable, a written agreement from all involved units that they are in support of the revisions.

College/Unit(s) Submitting Proposal: COM—BSBS

Proposed Effective Term/Year: Immediately

Unit(s) Housing Program: Burnett School of Biomedical Sciences

Name of program, track and/or certificate: Cancer Biology Track in MS Biomedical Sciences

Please check all that apply: This action affects a: ☐ Program ☑ Track ☐ Certificate

If the revision applies to multiple tracks, please list them here:

Brief description of **program and rationale** of the revision: **Do not add complete catalog copy here.**

The Modeling and Simulation (M&S) MS program is intended to expose students to M&S techniques as tools for understanding and researching different areas of focus. This program revision is proposed to add a new core course to ensure that students can properly identify and utilize the most common simulation techniques. Upon increasing the core requirements by one course, the elective requirements will be decreased by the same amount in order to keep the total program hours unchanged. The elective requirement will also be further defined for the non-thesis option.

Adding this specific core course is recommended based on feedback from external consultants that was part of our recent 7-year academic program review. It reflects the growing need to ensure students are knowledgeable of the most common simulation techniques.

The overall credit hours for the program (30hrs) will not be changed.

Briefly list curriculum changes in bullet format. If there are changes to the credit hours of the program, required courses or other requirements, please state those changes. **Remember to attach the catalog copy showing changes, using Track Changes in Word.**

A revision to the Modeling and Simulation MS is proposed to increase the core requirements by one course and decrease the elective requirement by the same amount while further defining the non-thesis elective requirement. These changes are outlined below:

* Core: Currently require 12 credit hours; propose increase to 15 credit hours.
  * New course IDS 6XXX Simulation Techniques will be added as a requirement for MS degree (regardless of thesis or non-thesis option).
  * Thesis option will require new course IDS 6XXX Research Design for M&S instead of previously required IDS 6916 Practicum
  * Non-thesis option will continue requirement of IDS 6916 Practicum

* Electives: Reduce by 3 credit hours for thesis and non-thesis options.
  * Thesis option will now require 9hrs of unrestricted electives (instead of 12hrs) + same requirement of 6hrs of thesis. No change to composition of elective choices.
  * Non-thesis option will now require 15hrs of electives instead of 18hrs. These 15hrs will be further defined to require at least one restricted M&S elective (3hrs), while the remaining 12hrs will remain unrestricted pending advisor and program director approval. This will be monitored by the M&S Graduate Program Office.

Name Change

Are you changing the name of an existing program, track, or certificate? ☐ Yes ☐ No

If yes, provide the new name of the program, track, or certificate: n/a

A proposed name change will apply to the record of all students who are currently enrolled, readmitted or newly admitted into this program as of the effective date of this change.

Impact on Current Students

Will students be moved from an existing program, track, or certificate into this new program, track, or certificate? ☐ Yes ☐ No

If yes, state the name of the program or track where students are currently enrolled and attach a list of students if possible:

Students enrolled in MS Biomedical Sciences may choose to select Cancer Biology Track.

Will students have the option to stay in their existing program, track, or certificate? ☐ Yes ☐ No

If yes, how will current students be impacted by this change?

This change will impact new, incoming students admitted for Fall 2016.

Existing students with previous catalog years will have the option to move to this updated curriculum if they wish to do so, but it will not be required of them.

If there are substantial revisions, please complete the following table on financial support: (Specify all forms of support – assistantships, fellowships, and tuition remission.)

	Number of assistantship students	Source of funds	Number of fellowship students (specify fellowship)	Number of tuition remissions	Source of funds
Year 1	No		No	No	
Year 2	No		No	No	
Year 3	No		No	No	

Signature Page

Recommend Approval (all approval levels must be signed)

Graduate Faculty Program Coordinator (Print) Joseph J. LaViola (Signature) _____ Date 6/14/2016

Department Chair /Director (Print) Randall Shumaker (Signature) _____ Date 6/15/2016

College Academic Standards (Print) _____ (Signature) _____ Date _____

College Dean (Print) _____ (Signature) _____ Date _____

Graduate Council (Print) _____ (Signature) _____ Date _____

Graduate Dean (Print) _____ (Signature) _____ Date _____

Approval

Provost and Executive Vice President: _____ Date _____

Distribution: After approval is received from the Provost, distribution will be to:

Department(s); College; Registrar; Associate Registrar; Institutional Knowledge Management; Academic Services; College of Graduate Studies

Modeling and Simulation PhD

College : Graduate Studies	**Degree :**
Department :	**Option :** Dissertation
Program Websites : http://www.ist.ucf.edu/grad/index.html	

PROGRAM DESCRIPTION

The Modeling and Simulation PhD is an interdisciplinary degree primarily intended for students with an academic or work background in mathematics, sciences, engineering, or computer science who wish to pursue a career in academia, government, defense, entertainment, technology, service or manufacturing.

Show Program Description

CURRICULUM

The Modeling and Simulation PhD requires a minimum of 72 credit hours of coursework beyond the bachelor's degree, including a minimum of 15 dissertation hours.

The M&S PhD program requires 15 credit hours of 5 required core courses. These core courses will provide an interdisciplinary framework for all students.

The remaining 42 credit hours may consist of additional unrestricted elective courses and research hours. At least 27 hours of the total program must consist of formal coursework, exclusive of independent study.

Total Credit Hours Required:
72 Credit Hours Minimum beyond the Bachelor's Degree
42 Credit Hours Minimum beyond the Master's Degree

Students may fulfill the restricted elective requirements through the courses chosen in the restricted core. Such students will meet the total credit hour requirements with additional unrestricted elective courses.

Required Courses—15 Credit Hours

Core—15 Credit Hours

- IDS 6147 Perspectives on Modeling and Simulation (3 credit hours)
- DIG 5876 Quantitative Aspects of Modeling and Simulation (3 credit hours)* ~~or an advanced higher level quantitative course as approved by the Graduate Program Director~~
- IDS 6148 Human Systems Integration for Modeling and Simulation (3 credit hours) or EIN 6258 Human Computer Interaction (3 credit hours) or EXP 6541 Advanced Human-Computer Interaction (3 credit hours)
- IDS 6XXX Simulation Techniques (3 credit hours)
- IDS 6XXX Research Design for Modeling and Simulation (3 credit hours)
- ~~IDS 6916 Simulation Research Methods and Practicum (3 credit hours)~~

- ~~An advanced research methods course (at least 3 credit hours). The purpose of the advanced research methods course is to provide background and analysis of the interpretive act in all educational research and to prepare students to perform independent research for their dissertations. Topics covered in these types of courses typically include research questions/hypotheses formulation, critical analysis of journal articles when performing a survey of the open literature, data collection and sampling methods, experimental and quasi-experimental designs, statistical methods, quantitative and qualitative data analysis and research report writing. Eligible advanced research methods courses for the M&S PhD program are:~~
  - ~~DIG 6825 Digital Media Research Methods (3 credit hours)~~
  - ~~ESI 6247 Experimental Design and Taguchi Methods (3 credit hours)~~
  - ~~ESI 6891 IEMS Research Methods (3 credit hours)~~
  - ~~PHI 5340 Research Methods in the Cognitive Sciences (3 credit hours)~~
  - ~~PSY 6216C Research Methodology (4 credit hours)~~
  - ~~STA 5205 Experimental Design (3 credit hours)~~
  - ~~A graduate-level advanced research methods course approved by a M&S Program Director~~

* Students that are deemed to have strong mathematical preparation can be waived from the requirement of Quantitative Methods (DIG 5876) and can instead take an additional elective course so long as the total program credit hours are met. This determination will be made by the M&S Graduate Program Office.

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Restricted Elective – 3 Credit Hours

Students must select an elective course from the Modeling and Simulation Graduate Program. Appropriate courses include those that follow. Others may be added over time with Program Director approval.

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- IDC 5602 Cybersecurity: A Multidisciplinary Approach (3 credit hours)
- IDC 6601 Behavioral Aspects of Cybersecurity (3 credit hours)
- IDC 6700 Interdisciplinary Approach to Data Visualization (3 credit hours)
- IDS 5XXX Instructional Design for Modeling and Simulation (3 credit hours)
- IDS 6146 Modeling and Simulation Systems (3 credit hours)
- IDS 6149 Modeling and Simulation for Test and Evaluation (3 credit hours)
- IDS 6916 Simulation Research Methods and Practicum (3 credit hours)
- IDS 6938 Intelligent Tutoring System (ITS) Design (3 credit hours)

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Unrestricted Electives—~~42~~ 39 Credit Hours

All M&S PhD degree program students must take at least ~~42~~ 39 credit hours of unrestrictive elective courses that reflect at least two disciplines that support the student's area of graduate study.

A student must carefully select a set of courses in order to design an appropriate plan of coursework. The purpose of the courses is to ensure that students have depth in their research area as well as have breadth in the interdisciplinary area of modeling and simulation. The set of courses should also support a student's area of graduate study and to meet the specific educational needs, goals and objectives of that student.

Unrestricted electives must consist of at least ~~12~~ 9 credit hours of formal courses, excluding independent study. The remaining credits may consist of additional coursework, directed research, independent study, and additional dissertation as advised appropriately by faculty adviser and/or program director.

Waived Credits

The doctoral program will allow up to 30 credit hours to be waived from an earned master's degree.

Dissertation—15 Credit Hours Minimum

- XXX 7980 Dissertation Research (15 credit hours minimum)

Participating Faculty

Attachment for Program Recommendation Form

Faculty Teaching Core Courses:

- Patricia Bockelman Morrow, Ph.D.
- R. Paul Wiegand, Ph.D.
- Joseph Kider, Ph.D.
- Pamela Douglas, Ph.D.

Graduate Faculty:

(Taken from the UCF Graduate Catalog as of June 8, 2016 - http://graduatecatalog.ucf.edu/GradFaculty/)

- Abdel-Aty, Mohamed
- Al-Deek, Haitham
- Barber, Daniel
- Bowers, Clint
- Chin, Matthew
- Cooper, David
- Fiore, Stephen
- Garibay, Ivan
- Goldiez, Brian
- Gonzalez, Avelino
- Hancock, Peter
- Hirumi, Atsusi
- Hughes, Charles
- Jentsch, Florian
- Karwowski, Waldemar
- Kaup, David
- Khaled, Annette
- Kincaid, Peter
- Lackey, Stephanie
- Laviola II, Joseph
- Martin, Glenn
- Matthews, Gerald
- McCauley, Pamela
- McDaniel, Rudy
- Mollaghasemi, Mansooreh
- Morrow, Patricia Bockelman
- Pensky, Marianna
- Proctor, Michael
- Rabelo, Luis
- Radwan, Essam
- Reilly, Chuck
- Reinerman, Lauren
- Salas, Eduardo
- Schott, Jim
- Sepulveda, Jose
- Shumaker, Randall
- Sims, Valerie
- Smith, Peter
- Wang, Morgan
- Weishampel, John
- Wiegand, Paul
- Wu, Annie

Graduate Faculty Scholars:

(Taken from the UCF Graduate Catalog as of June 8, 2016 - http://graduatecatalog.ucf.edu/GradFaculty/scholar.aspx)

- Abich, Julian
- Akbas, Ilhan
- Allen, Christine
- Andrews, Anya
- Bailenson, Jeremy
- Berman, Stephen
- Blumberg, Fran
- Boustique, Hatim
- Burgess, Deborah
- Cannon-Bowers, Janis
- Cuty Ruiz, Laura
- deWinter, Jennifer
- Divo, Eduardo *
- Dwyer, Daniel
- Everett, George
- Fidopiastis, Cali
- Finch, Craig
- Funke, Gregory
- Gallagher, Shaun
- Gerber, Matthew
- Gilson, Richard
- Goldberg, Stephen
- Graniela Ortiz, Benito
- Griego, Regina
- Cho, Hyoung
- Jaganathan, Sivakumar
- Keebler, Joseph
- Lang, Sheau-Dong
- Lemacks, Jennifer
- Leonessa, Alexander
- Lindgren, Robb
- Lisle, Curtis
- Liu, Alan
- Maraj, Crystal
- Maxwell, Douglas
- Metcalf, David
- Misquitta, Leonie
- Mohammad, Syed
- Mondesire, Sean
- Morgan, Justin
- Morie, Jacquelyn
- Morris, Cliff
- Moshell, Michael
- Muhs, Tammy
- Nagendran, Arjun
- Ness, James
- Neville, Kelly
- Nicholson, Denise
- Panganiban Fallon, April
- Quijada, Sergio
- Rehman, Zia
- Salcedo, Julie
- Schatz, Sae
- Smith, Roger

- Sotomayor, Teresita
- Sottilare, Robert
- Stevens, Jonathan
- Talbot, Brett
- Taylor, Grant
- Taylor, Gregory
- Ullrich, Andreas
- VanderVeen, Cornelius
- Vogel-Walcutt, Jennifer
- Whitmire, James
- Williams, Kent
- Wittman, Robert LeRoy
- Yonekura, Francisca

UNIVERSITY OF CENTRAL FLORIDA
COLLEGE OF GRADUATE STUDIES

NEW FORM – BEGINNING FALL 2015

Program Recommendation Form - REVISIONS ONLY

This form is to be used to **REVISE** degree programs, tracks, or certificate programs. If there are changes to a program and the changes will also affect the program tracks, one form may be used for both the program and the track(s).

Please refer to the Graduate Council Curriculum Meeting Schedule for submission deadlines.

Checklist of items to be attached with completed form:

☑ Complete and current Graduate Catalog copy (www.graduatecatalog.ucf.edu), including description, curriculum, contact information, application requirements, and application deadlines. Use Track Changes in Word to show revisions.

☐ A list of faculty who will participate in the program, track or certificate and their credentials.

☑ All course action requests that will be needed to implement the curriculum changes.

☐ If applicable, a written agreement from all involved units that they are in support of the revisions.

College/Unit(s) Submitting Proposal: COM—BSBS

Proposed Effective Term/Year: Immediately

Unit(s) Housing Program: Burnett School of Biomedical Sciences

Name of program, track and/or certificate: Cancer Biology Track in MS Biomedical Sciences

Please check all that apply: This action affects a: ☐ Program ☑ Track ☐ Certificate

If the revision applies to multiple tracks, please list them here:

Brief description of **program and rationale** of the revision: **Do not add complete catalog copy here.**

The Modeling and Simulation (M&S) MS program is intended to expose students to M&S techniques as tools for understanding and researching different areas of focus. This program revision is proposed to add a new core course to ensure that students can properly identify and utilize the most common simulation techniques. Upon increasing the core requirements by one course, the elective requirements will be decreased by the same amount in order to keep the total program hours unchanged. The elective requirement will also be further defined for the non-thesis option.

Adding this specific core course is recommended based on feedback from external consultants that was part of our recent 7-year academic program review. It reflects the growing need to ensure students are knowledgeable of the most common simulation techniques.

The overall credit hours for the program (30hrs) will not be changed.

Briefly list curriculum changes in bullet format. If there are changes to the credit hours of the program, required courses or other requirements, please state those changes. **Remember to attach the catalog copy showing changes, using Track Changes in Word.**

A revision to the Modeling and Simulation MS is proposed to increase the core requirements by one course and decrease the elective requirement by the same amount while further defining the non-thesis elective requirement. These changes are outlined below:

* Core: Currently require 12 credit hours; propose increase to 15 credit hours.
  * New course IDS 6XXX Simulation Techniques will be added as a requirement for MS degree (regardless of thesis or non-thesis option).
  * Thesis option will require new course IDS 6XXX Research Design for M&S instead of previously required IDS 6916 Practicum
  * Non-thesis option will continue requirement of IDS 6916 Practicum

* Electives: Reduce by 3 credit hours for thesis and non-thesis options.
  * Thesis option will now require 9hrs of unrestricted electives (instead of 12hrs) + same requirement of 6hrs of thesis. No change to composition of elective choices.
  * Non-thesis option will now require 15hrs of electives instead of 18hrs. These 15hrs will be further defined to require at least one restricted M&S elective (3hrs), while the remaining 12hrs will remain unrestricted pending advisor and program director approval. This will be monitored by the M&S Graduate Program Office.

Name Change

Are you changing the name of an existing program, track, or certificate? ☐ Yes ☐ No

If yes, provide the new name of the program, track, or certificate: n/a

A proposed name change will apply to the record of all students who are currently enrolled, readmitted or newly admitted into this program as of the effective date of this change.

Impact on Current Students

Will students be moved from an existing program, track, or certificate into this new program, track, or certificate? ☐ Yes ☐ No

If yes, state the name of the program or track where students are currently enrolled and attach a list of students if possible:

Students enrolled in MS Biomedical Sciences may choose to select Cancer Biology Track.

Will students have the option to stay in their existing program, track, or certificate? ☐ Yes ☐ No

If yes, how will current students be impacted by this change?

This change will impact new, incoming students admitted for Fall 2016.

Existing students with previous catalog years will have the option to move to this updated curriculum if they wish to do so, but it will not be required of them.

If there are substantial revisions, please complete the following table on financial support: (Specify all forms of support – assistantships, fellowships, and tuition remission.)

	Number of assistantship students	Source of funds	Number of fellowship students (specify fellowship)	Number of tuition remissions	Source of funds
Year 1	No		No	No	
Year 2	No		No	No	
Year 3	No		No	No	

Signature Page

Recommend Approval (all approval levels must be signed)

Department Chair /Director (Print) _____ (Signature) _____ Date _____

College Academic Standards (Print) _____ (Signature) _____ Date _____

College Dean (Print) _____ (Signature) _____ Date _____

Graduate Council (Print) _____ (Signature) _____ Date _____

Graduate Dean (Print) _____ (Signature) _____ Date _____

Approval

Provost and Executive Vice President: _____ Date _____

Distribution: After approval is received from the Provost, distribution will be to:

Department(s); College; Registrar; Associate Registrar; Institutional Knowledge Management; Academic Services; College of Graduate Studies

PROGRAM DESCRIPTION

The Master of Science in Nanotechnology program provides students with scientific knowledge and research training in nanoscience and nanotechnology. The program prepares students for seeking employment in industry and academia involved in nanotechnology research, product development and commercialization, or to pursue advanced PhD degrees in related areas.

The Nanotechnology MS program consists of 30 credit hours of study that covers Fall, Spring and Summer consecutive academic terms. Admissions to the program occur in both the Fall and Spring semester of each year, and students are expected to finish the degree in two years.

The program of study includes a balanced course offering including interdisciplinary scientific courses and research training in the field of nanotechnology. The curriculum of courses is delivered via face-to-face instruction. The program includes 3 credit hours of ~~directed research~~ independent study and 6 credit hours of thesis research under the supervision of a faculty at the NanoScience Technology Center. This training will provide students with hands-on research experiences on nanomaterial synthesis, nanostructure fabrication and characterization, and application development in their interested areas.

CURRICULUM

The Nanotechnology MS program consists of 30 credit hours of graduate courses including 12 credit hours of required (core) courses in nanotechnology, 9 credit hours of elective courses in physics, engineering, chemistry, biology or other related field, 3 credit hours of ~~directed research~~ independent study, and 6 credit hours of thesis research.

From the core courses in nanotechnology and elective courses in related science/engineering areas, students will gain basic and broader understanding of the most advanced techniques, developments and applications of nanoscale materials and devices. From the ~~directed research~~ independent study and thesis research training, the students will gain hands-on experiences to work on problems and product development involving nanoscience and nanotechnology.

Total Credit Hours Required:

30 Credit Hours Minimum beyond the Bachelor's Degree

Required Courses—15 Credit Hours

Core Courses—12 Credit Hours

Select four courses from the following list of courses.

IDS 6250 Introduction to Nanoscience and Nanotechnology (3 credit hours)

IDS 6254 Nanofabrication and Characterization (3 credit hours)

IDS 6252 Biomedical Nanotechnology (3 credit hours)

IDS 6255 Nanotechnology in Energy and Sustainability (3 credit hours)

IDS 6253 Bioanalytical Technology (3 credit hours)

~~Directed Research~~ Independent Study —3 Credit Hours

~~Students will receive basic training under the supervision of a NanoScience Technology Center faculty to conduct research, including ethical training, safety training, attending seminar presentations, conducting a literature survey, and using various instrumentation techniques for research.~~

Students will take 3 credit hours of independent study, resulting in a required research report of independent learning experience. Independent Study must have a formally defined core of knowledge to be learned by the student. In accordance with the policy of the College of Graduate Studies, the core of knowledge to be learned by the student must be specified in written form and approved by the student, the instructor, and the program coordinator prior to enrollment in Independent Study.

~~IDS 6918 Directed Research (3 credit hours)~~

Elective Courses—9 Credit Hours

Elective courses may be chosen from the following recommended course list. Core courses taken beyond the 4-core course requirement may be used to satisfy the elective course requirement. Other courses may be taken as elective courses upon the approval of graduate program director.

EMA 5586 Photovoltaic Solar Energy Materials (3 credit hours)
EMA 5060 Polymer Science and Engineering (3 credit hours)
EMA 6518 Transmission Electron Microscopy (3 credit hours)
EMA 5505 Scanning Electron Microscopy (3 credit hours)
EMA 6605 Materials Processing Techniques (3 credit hours)
EMA 5587C Characterization and Reliability of PV Cells (3 credit hours)
PHY 5704 Physics of Nanoelectronic Devices (3 credit hours)
OSE 5312 Light Matter Interaction (3 credit hours)
OSE 6938 ST: Photonic Polymer Materials (3 credit hours)
IDS 5127 Foundation of Bio-Imaging Science (3 credit hours)
MCB 5225 Molecular Biology of Disease (3 credit hours)
PCB 5238 Immunobiology (3 credit hours)
PCB 5236 Cancer Biology (3 credit hours)
IDS 6251 Computation, Simulation and Modeling in Nanotechnology (3 credit hours)

Thesis—6 Credit Hours

Students will conduct and complete an independent thesis research project under the supervision of a NanoScience Technology Center faculty. The student will defend the thesis at the completion of the study. Students will gain hands-on research experiences on nanomaterial synthesis, nanostructure fabrication and characterization, and application development in their interested areas.

IDS 6971 (6 credit hours)

APPLICATION REQUIREMENTS

For information on general UCF graduate admissions requirements that apply to all prospective students, please visit the Admissions section of the Graduate Catalog. Applicants must apply online. All requested materials must be submitted by the established deadline.

Applicants should have obtained an undergraduate degree in one of the following areas: physics, chemistry, biology, or engineering.

In addition to the general UCF graduate application requirements, applicants to this program must provide:

One official transcript (in a sealed envelope) from each college/university attended

Résumé or Curriculum Vitae

Goal Statement

The goal statement should discuss all relevant professional background and any previous research and/or teaching experience. The statement should explain the motivation behind the pursuit of a Professional Science Master's degree in Nanotechnology. Future career goals after the completion of the applicant's master study should be discussed.

The goal statement should between 500 and 1,000 words.

Three letters of recommendation

Applicants applying to this program who have attended a college/university outside the United States must provide a course-by-course credential evaluation with GPA calculation. Credential evaluations are accepted from World Education Services (WES) or Josef Silny and Associates, Inc. only.

The acceptance decision will be based on the assessment of the applicant's GPA from previous college/university, past work experience, recommendation letters and the statement of interest and objectives. Additionally, the committee will evaluate other academic indicators such as having completed a senior thesis, authorship on publications, internship, involvement in scientific research projects, and/or presentations at major scientific meetings and non-academic indicators such as evidence of leadership, extracurricular activities, work or military experience, and/or volunteer activities. For applicants that already have had working experiences in STEM (Science, Technology, Engineering, Mathematics) fields, emphasis will be placed on their past experiences and recommendation letters.

Readmission

Applicants who are applying for readmission need not resubmit transcripts if the transcripts are previously on file with UCF. However, the following application requirements do need to be current for the new readmission application:

Résumé/Curriculum Vitae

Goal Statement

Letters of Recommendation
Application Deadlines

Nanotechnology MS *Fall Priority Fall Spring Summer
Domestic Applicants
-
Jul 15 Dec1
-
International Applicants
-

Jan 15 Jul 1
-

International Transfer Applicants
-

Mar 1 Sep 1
-

*Applicants who plan to enroll full time in a degree program and who wish to be considered for university fellowships or assistantships should apply by the Fall Priority date.
FINANCIALS

Graduate students may receive financial assistance through fellowships, assistantships, tuition support, or loans. For more information, see the College of Graduate Studies Funding website, which describes the types of financial assistance available at UCF and provides general guidance in planning your graduate finances. The Financial Information section of the Graduate Catalog is another key resource.
Fellowships

Fellowships are awarded based on academic merit to highly qualified students. They are paid to students through the Office of Student Financial Assistance, based on instructions provided by the College of Graduate Studies. Fellowships are given to support a student's graduate study and do not have a work obligation. For more information, see UCF Graduate Fellowships, which includes descriptions of university fellowships and what you should do to be considered for a fellowship.

University of Central Florida

Graduate Program Recommendation Form - INACTIVATIONS / SUSPENSIONS ONLY

This form is to be used to **INACTIVATE** or **SUSPEND** degree programs, tracks, or certificate programs.

Please refer to the Graduate Council Curriculum Meeting Schedule for submission deadlines.

Checklist of Items to be attached with completed form:

☐ If applicable, a written agreement from all involved units that they are in support of this inactivation or suspension.

☐ If applicable, attach a teach out plan.

College/Unit(s) Submitting Proposal: College of Graduate Studies

☐ **INACTIVATION - Proposed Effective Term/Year:** _____

Admissions will be permanently suspended for new students and the program will be removed from the online application. Students active in the program are eligible to complete the program under the appropriate criteria and an appropriate teach out plan is required. The program will be removed from the graduate catalog as of the approved term.

☒ **SUSPENSION - Proposed Effective Term/Year:** Spring 2017

Admissions will be temporarily suspended for new students and the program will be removed from the online application. A notation will be entered in the graduate catalog indicating the program is not accepting applications. Currently enrolled students will not experience any issues with continued enrollment. **Suspension is limited to no more than three years.**

Unit(s) Housing Program: Interdisciplinary Studies

Name of program, track and/or certificate: Conservation Biology PSM

Please check all that apply: This action affects a: ☒ **Program** ☐ **Track** ☐ **Certificate**

If the inactivation/suspension applies to multiple tracks, please list them here:

Brief description of **program and rationale** for the inactivation/suspension: **Do not add complete catalog copy here.**

The Department of Biology, the original home of the program, is not interested in supporting this program at any administrative level (e.g., admission, advising, assessment). The College of Graduate Studies does not have the staff or expertise to support and administer the program.

The date for the original suspension was incorrect as the last cohort prior to suspension was to begin in fall 2016.

Impact on Current Students

Are students currently enrolled in the program? ☒ Yes ☐ No

If yes, number of current students: 10

If program, track, or certificate is being inactivated or suspended, then attach a "teach out" plan for all current students specifying how they can finish the program or where students will be placed if moving to another program. The "teach out" plan should specify when courses will be offered to enable students to finish. Specify whether students will remain in the existing program to finish, and if yes, when the completion date will be, whether students will be moved to another program, etc.

See below.

Enter the terms and courses that will be taught for each term throughout the last semester.

Fall	Spring	Summer	Fall	Spring

The PSM courses are run through other departments primarily biology, business, public administration and policy. The internships are organized by the College of Graduate Studies and will continue until the students graduate from the program. These typically occur during the last spring or summer semester of their program.

Signature Page

Recommend Approval (all approval levels must be signed)

Graduate Faculty Program Coordinator (Print) John Weishampel (Signature) _____ Date 9/9/16

Department Chair /Director (Print) John Weishampel (Signature) _____ Date 9/9/16

College Academic Standards (Print) N/A (Signature) _____ Date _____

College Dean (Print) Tracy Jones (Signature) _____ Date _____

Graduate Council (Print) _____ (Signature) _____ Date _____

Vice President for Research and Dean of the College of Graduate Studies
(Print) Elizabeth Klonoff (Signature) _____ Date _____

Approval

Provost and Executive Vice President _____ Date _____

Distribution: After approval is received from the Provost, distribution will be to:

Department(s); College; Registrar; Associate Registrar; Institutional Knowledge Management; Academic Services; College of Graduate Studies

UNIVERSITY OF CENTRAL FLORIDA
COLLEGE OF GRADUATE STUDIES

Split-Level Class Action Request Form

The Graduate Council Curriculum Committee discourages the establishment of split-level classes. Graduate students are entitled to more challenging content, instruction, and assessment, which are difficult to provide in classes offered to undergraduates as well. Circumstances may compel a unit to propose a split-level class. In these cases, the proposal should indicate the reasons a split-level class is necessary and what long-term measures are being taken to provide undergraduates and graduates with appropriate coursework. In addition, it is important to differentiate each of the undergraduate and graduate course elements. To provide reviewers with a clear delineation of the differences between the 4000 and 5000 courses, Summary Tables 1 and 2 should be completed.

Please submit this form along with the completed Course Action Request (CAR) form. Include both the 4000 syllabus and the 5000 syllabus. **The 5000 syllabus should bold any additions or differences.**

Provide narrative rationale for split-level class:

ZOO4605 Clinical Embryology and Congenital Malformations is an advanced course currently only offered to undergraduate students. We propose to add a graduate section to this course so that it may be included as one of the key elective courses available to students in a new "Integrated Medical Sciences" ("IMS") track that we are developing in our Biomedical Sciences MS (non-thesis) Program. The IMS track is being developed to provide students with an opportunity to enhance their knowledge and skills in preparation for careers in the health sciences professions. Students accepted into this program will take a combination of first-year medical school courses together with graduate courses in biomedical sciences.

Table 1— List any **course objectives or content:**

1) that is common to both the undergraduate and graduate syllabi but have been differentiated for undergraduate and graduate students. For example, an objective for undergraduates may require identification of a concept where the graduate objective may require application;

or

2) in cases where entirely new objectives or content have been added to the existing undergraduate objectives and content, in the 5000 course column list any course elements that the graduate syllabus requires in addition to the elements of the undergraduate syllabus. For example, if there are 3 course readings in the undergraduate syllabus and a 4th reading was added for the graduate syllabus, list it in the 5000 course column and leave the 4000 course column blank.

Table 1 Differences Between 4000 and 5000 Course Objectives & Content

Course Element	4000 Course	5000 Course
Objective 14	n/a	Apply knowledge to lead clinical PBL case presentations and facilitate class discussions
Objective 15	n/a	Analyze and present original research paper(s) in molecular biology of development

Table 2—List different or additional **assessment** elements (course assignments and tests that count toward the grade). For example, if an undergraduate course assignment that requires students to read an article and write a reflection has been expanded to require graduate students to read a book and present it to the class, the two versions of this assignment would be contrasted in this table. If a third exam was added for graduate students, list it in the 5000 column.

Table 2 Differences Between 4000 and 5000 Course Assessment

Course Element	4000 Course Assessment & % of grade	5000 Course Assessment & % of grade	
Exams (4 total)	In-class written exams, 100% of grade	In-class written exams (same)	67% of grade
PBL Case Presentations	n/a	Lead in-class PBL discussions	16.5% of grade
Research Paper Presentations	n/a	Oral in-class presentation	16.5% of grade

University of Central Florida

Graduate Course Action Request Form

☑ Course Addition ☐ Course Revision ☐ Course Deletion

Forward to your college office

Course additions and course revisions must be accompanied by a course syllabus and rationale. Departments must also submit an electronic syllabus to the college curriculum person.

Course Information

College: College of Medicine **Department:** Burnett School of Biomedical Sciences

Department Chair: Dr. Griffith Parks **Phone:** 407-823-5932

Approved Graduate Faculty/Scholars: Dr. Raheleh Ahangari

	Course Prefix	Number	Title	Credit Hours Ex.: 3(3,0)
Current or New Course	ZOO	5XXX	Clinical Embryology and Congenital Malformations	3(3,0)
Proposed Course Revision				

30 Character Abbreviation: Clinical Embryology and Congenital Malformations

Course Description (25 word limit)

Functional human embryology in a clinically oriented way to study the human development and congenital malformations as a result of genetic, environmental and toxic conditions.

New or revised Materials and Supply Fees? ☐ Yes ☑ No If yes, also complete the Materials and Supply Fee Request Form.

Repeat for credit? ☐ Yes ☑ No If yes, indicate the total times this course may be used in the degree program. _____

Repeat within same semester? ☐ Yes ☑ No

NOTE: For a repeatable course, indicate in the syllabus what will remain the same and what will change when the course is repeated. Also indicate who approves content before a course is repeated.

Prerequisite(s) and/or Corequisite(s): PR: ZOO 3733C or equivalent.

Graded S/U? ☐ Yes ☑ No

Split-Level Class: ☑ Yes ☐ No

If offering a split-level class, complete this section even if it had been approved earlier for individual delivery.

List undergraduate split-level course: ZOO 4605 Clinical Embryology and Congenital Malformations

NOTE: Both the graduate and the undergraduate split-level syllabi must be approved through the established university process for approving courses so that there are two separate and complete syllabi for each course. The graduate syllabus should clearly demonstrate more advanced subject matter, expectations, and rigor. Attach both undergraduate and graduate syllabi to this form.

Term of Offering

When will the course be offered?

☐ Odd Fall ☑ Odd Spring ☑ Odd Summer ☐ Every Semester

☐ Even Fall ☑ Even Spring ☑ Even Summer ☐ Occasional

Intended Utilization of Course

The course will be used primarily as:

☐ Required Course ☑ Elective Course

Justification for Course Addition or Course Revision

What is the rationale for adding or revising this course?

ZOO 4605 Clinical Embryology and Congenital Malformations is an advanced course currently only offered to undergraduate students. We propose to add a graduate section to this course so that it may be included as one of the key elective courses available to students in a new "Integrated Medical Sciences" ("IMS") track that we are developing in our Biomedical Sciences MS (nonthesis) Program. The IMS track is being developed to provide students with an opportunity to enhance their knowledge and skills in preparation for careers in the health sciences professions. Students accepted into this program will take a combination of first-year medical school courses together with graduate courses in biomedical sciences.

What majors require or recommend this course for graduation? Biomedical Sciences M.S., Ph.D. and tracks

If not a major requirement, what will be the source of students? Other life science MS and/or Ph.D. students

What is the estimated annual enrollment? 15

Possible duplications and conflicts with other departments or colleges should be discussed with appropriate parties. Please detail discussion you have had.

None.

Justification for Course Deletion

Is this course a required course for graduation in a major or prerequisite? ☐ Yes ☑ No

If yes, have the involved major departments been informed, in writing, of proposed deletion? ☐ Yes ☐ No

If not, explain

Notes:

Approval Signatures

Assoc Director Chair

Department Chair _____ **Date** 8/31/16

College Academic Standards _____ **Date** 9/1/16

Assoc Dir.

College Dean _____ **Date** 8/31/16

Graduate Council _____ **Date** _____

Vice President for Research and Dean of the College of Graduate Studies _____ **Date** _____

UNIVERSITY OF CENTRAL FLORIDA
DEPARTMENT OF MOLECULAR BIOLOGY AND MICROBIOLOGY
BURNETT SCHOOL OF BIOMEDICAL SCIENCES , COLLEGE OF MEDICINE
ZOO 5xxx-Spring 2016

Course: Clinical Embryology and Congenital Malformations
Lecture: 3 hours per week, Mon & Wed & Fri 3.30- 4.20 p.m Location:…..
Professor: Dr. Raheleh Ahangari M.D., e-m@il: rahangar@mail.ucf.edu
Dr. Mohtashem Samsam M.D., Ph.D. e-m@il: msamsam@mail.ucf.edu

Office: HPA II-319; Phone (407) 823-1793
Office Hrs. : Mon- 11:30-12:30 p.m., 2:30-3:20 p.m.
Wed- 11:30am-12:30 p.m., 2:30-3:20 p.m. Fri- 2:30- 3:20 p.m.

Required Textbooks: 1- *The Developing Human, clinically oriented Embryology*. W.B. Saunders Company, 6th edition**,** by Moore and Persaud (ISBN:0-7216-6974-3).

Credits: 3

Description: Clinical embryology and congenital malformations is an advanced course focusing on the functional human embryology in a clinically oriented way to study the human development and congenital malformations as a result of genetic, environmental and toxic conditions. It will be conducted in order to integrate the macroscopic and some microscopic morphology of developing human systems. Basic understanding of biology is imperative for this course. Students will be able to describe various congenital diseases. This course is relevant for premed concentration and premed students who would like to go to medicine, dentistry or pharmacy.

Lecture: The course is delivered through face to face lectures which are delivered in 3 hours per week. Lectures are clinically oriented and consist of advanced human embryology according to the required book(s) and supplementary material such as lecture notes and other material found in UCF course web site. The last 15 min of the lectures are used for clinical discussions and problem-based learning.

Clinical Consideration and Problem-Based Learning: Every lecture will have a 15 minute devoted to Clinical Consideration and Problem-Based Learning (PBL) where students practice the clinical embryology and PBL and present clinical cases and discuss the case within the lecture/discussion sessions where the instructor acts as a facilitator and is present and guides the students in the whole process.

- **Graduate students will present at least two clinical case reports and are expected to lead group discussions on related PBLs.**
- **Graduate students will also present one or more clinical research papers in embryology during class. This will be a scholarly seminar-style presentation with a short question-answer period. These presentations should be for 10 minutes followed by 5 minutes Q&A.**

Prerequisite: Human anatomy ZOO 3733C or equivalent.

Course Objectives:

After completing this course, students will be able to show significant knowledge in human clinical embryology, and relevant pathologic consequences due to congenital malformations.

- Develop effective mental processing/picturing of the adult and embryonic organs studied, in order to identify correctly and correlate the appropriate information of the material presented.
- Learn comprehensive anatomy and embryology terminology.
- Review the male and female reproductive anatomy and physiology and gametogenesis (spermatogenesis and oogenesis)
- Know the mechanisms of cell division, Meiosis and Mitosis.
- Explain major human chromosomal abnormalities and their related diseases.
- Explain all major events taking place during embryonic human development in week 1, 2, and 3-8.
- Discuss the derivatives of ectoderm, endoderm, and mesoderm.
- Explain organogenesis of all human organs.
- Discuss the mechanisms of major human congenital malformations and explain the clinical cases through problem-based learning.
- Know the diagnosis and differential diagnosis of major human congenital disorders.
- Discuss the clinical investigation and normal/abnormal maternal laboratory values on blood tests, amniotic fluid, and other investigations.
- Recognize the congenital malformations by sign and symptoms, ultrasound during development, other imaging studies after birth, the gross pathology, and histopathology.
- Discuss the surgical approaches toward treatment of congenital disorders and other treatment options.
- **Graduate students will apply knowledge learned in this course to lead clinical PBL cases where they will act as facilitators in the learning process by synthesizing key concepts in clinical embryology.**
- **Graduate students will discuss selected topics in the molecular biology of development through presentation and analysis of original research paper(s).**

Attendance Policy:

All students enrolled in the ZOO 5xxx clinical embryology course are expected to attend to all programmed class meetings. Three to four (3-4), lecture combined, excused or unexcused absences to this course might adversely affect grades report. Examples of excused absences are medical situations, accidents, direct relative death, etc. In any of such circumstances, the correspondent written excuse should be presented to validate the excused condition. The fact that an absence might be excused if correspondingly evidenced, **does not** imply that it will not count for the students' absences record. *Excessive absences considering both, excused and unexcused, situation may result in withdrawn from the class.*

Leaving earlier than the dismissal time, may be interpreted as an absence and should be previously informed to the professor. Exams may *not* be announced. Thus, be on time to each class session because **exams and announcements as well, will be conducted at the beginning of class periods.** *It is not applicable to this course to do make-up of exam due to tardiness or absence*. Getting late to an exam session imply that the student will not be allowed by the professor to take the test with the rest of the class. *Which means that has to schedule for a make-up exam, if their reason is acceptable*. In order to make up a test, the student must contact me immediately to set up the day and time, which must be within one (2) days of the originally scheduled exam. *Make-up tests for the exams will cover the same material as regular examinations, however, might employ a different evaluation methodology (e.g. discussion questions, essays, etc). Final exam is usually the more comprehensive one.* There will be only **one** opportunity to make-up a missed theoretical test; if you do not attend to the reposition test as scheduled, will automatically result in a zero (0%). ***The final Exam cannot be made-up.*** *If you missed it either by tardiness or absence will result in a zero (0%).*

Talking during a test or any normative exercise will be interpreted as cheating and will result in a value of **zero** (0) in a scale of one hundred (100).

It is the students' responsibility to inquire about any eventuality announced while late or absent. However, be considerate and wise in selecting the moment to do so. Chatting during class sessions will not be tolerated, even if it is regarding to class or a lecture topic.

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Plagiarism whereby another's work is deliberately used or appropriated without any indication of the original source, thereby attempting to convey the impression that such work is the student's own. Any student failing to properly credit ideas or materials from another has plagiarized. Similarly, a student who has assisted another in any of the aforementioned breach of standards shall be considered equally culpable.

Disruptive behavior in the classroom will not be tolerated. Persistency in such conduct, which includes, but is no necessarily limited to, inappropriate and/or excessive noises, excessive talking, *cell phones* utilization, moving about, laughing, and malicious, vulgar, or vindictive speech, threats, or gestures. If the professor deems it necessary, you may be asked to leave the classroom. If the student(s) refuse, campus police will be contacted.

Grading Policy:

Grading will be based as specified hereinafter.

Normative Exercises	Quantity	Normative (pts.)	Total pts.
Lecture Exams†	**4**	**100**	**400**
Clinical Presentation/PBL and discussion†	**Every week**	**100**	**100**
Research Presentation	**1 paper**	**100**	**100**
Total			**600**

† Be on time to the tests, no students will be allowed to take them once started. This will result in a zero (0) if it is the final examination.

Grading Scale:

Grading will be performed based on a standard curve as follows:

Percentages (%)	Grade
100-90	**A**
89-80	**B**
79-70	**C**
69-60	**D**
59 or below	**F**

Disclaimer:

Changes in the syllabus or itinerary tasks may occur anytime, and will eventually be announced by the professor. In such case, a revised version of the syllabus or an addendum to the document *may be* issued at professor's discretion.

Any visual resource such as diagrams, charts and exhibits included in the text readings and/or lectures are considered part of class work. Thus, may be subject to evaluation as well.

Guidelines pointed herein, may be subject of change in case of fortuitous circumstances and /or according to the professor consideration.

LECTURES TENTATIVE SCHEDULE

WEEKS	*DATES*	*LECTURES*

January

Week 1 11-15

Embryology: Human Development (Days 1-7): Three phases of fertilization, Cleavage and blastocyst formation, Implantation.
Placenta and Amniotic Fluid: formation of the placenta, placental components : Decidua basalis and villous chorion, appearance of the placenta in afterbirth, functions of the placenta, placenta membrane, umbilical cord circulatory system of the fetus amniotic fluid.
Clinical Consideration and problem based learning (PBL): Ectopic tubal pregnancy, In vitro fertilization (IVF), Teratocarcinoma.Complete hydatidiform mole, Choriocarcinoma,

Week 2 19-22

Human Development (Days 8-14): Further development of the embryoblast, development of the trophoblast, development of extraembryonic mesoderm. Clinical considerations: developmental malformations and Human chorionic gonadotropin (hCG), Oncofetal antigens, Carcinoembryonic antigen (CEA), Alpha-fetoprotein, RU-486 (mifepristone).

Placenta and Amniotic Fluid (continued),

Clinical consideration and PBL: Premature rupture of the amniochorionic membrane, Amniotic band syndrome, Abnormal placental shapes, Placenta previa , Placental abruption , Erythroblastosis fetalis, Oligohydramnios, Polyhydramnios, Twinning, developmental anomalies and Alpha –fetoprotein.

Week 3 25-29

Embryonic Period (Week 3-8): General considerations, development of the embryoblast, angiogenesis (blood vessel formation), hematopoiesis.

Clinical consideration and PBL: Sacrococcygeal teratoma, Chordoma, Caudal dysplasia, Missed menstrual period.

***** Exam 1*** **Feb. 1**

February

Week 4 1-5 **Exam 1: Feb. 1**

Development of Cardiovascular System: development of the heart, development of the arterial system, development of the venous system, fetal blood circulation. Aorticopulmonary (AP) septal defects, Persistent truncus arteriosus (PTA), Transposition of the great arteries (complete), Atrial septal defects (ASDs), Atrioventricular (AV) septa defects, Double outlet right ventricle, Tetralogy of Fallot

Clinical consideration and PBL: Aorticopulmonary (AP) septal defects, Persistent truncus arteriosus (PTA), Tetralogy of Fallot

Week 5 8-12

Developmental malformations of the heart and cardiovascular system: Double inferior vena cava, Left superior vena cava, Double superior vena cava, Absence of the hepatic portion of the inferior vena cava.

Clinical consideration and PBL: Double inferior vena cava, Left superior vena cava,

Week 6 15-19

Placenta and Amniotic Fluid: formation of the placenta, placental components : Decidua basalis and villous chorion, appearance of the placenta in afterbirth, functions of the placenta, placenta membrane, umbilical cord circulatory system of the fetus amniotic fluid. Complete hydatidiform mole, Choriocarcinoma, Premature rupture of the amniochorionic membrane, Amniotic band syndrome, Abnormal placental shapes, Twinning.

Clinical consideration and PBL: Placenta previa , Placental abruption , Erythroblastosis fetalis, Oligohydramnios, Polyhydramnios, developmental anomalies and Alpha –fetoprotein.

*****Lecture exam 2 Feb. 22***

Week 7 22-26 **Exam 2 Feb. 22**

Nervous System: development of the neural tube, neural crest, placodes, stages of neural tube development, Development: of the spinal cord, myelencephalon, metencephalon, mesencephalon, diencephalons , optic structures, and hypophysis, telencephalon, autonomic nervous system, cranial nerves, choroids plexus. Congenital malformations of the central nervous system **:** Spina bifida, Ossification defects of the occipital bone(cranium bifidum) , anencephaly(meroanencephaly), Arnold-Chiari malformation, Dandy Walker syndrome, Hydrocephalus, Porencephaly, False Porencephaly, Hydranecephaly, Holoprosencephaly , Megacolon (Hirschsprungs disease), Tethered spinal cord (filum terminale syndrome)

Clinical consideration and PBL: Dandy Walker syndrome, Hydrocephalus, Hirschsprungs disease

March

Week 8 29-4

Ear: development of Internal ear, Middle ear, External ear. Congenital malformations of the ear: Congenital deafness, Malformation of the auricles in chromosomal syndromes, Atresia of the external auditory meatus, Congenital cholesteatoma

Eye: development of optic vesicle and other eye structures. Congenital malformations of the eye: Coloboma iridis, Persistent iridopupillary membrane, Congenital cataracts,
Glaucoma ,Microphthalmia, Anophthalmia ,Cyclopia, Retinocele, Retrolental fibroplasias , Detached retina Papilledema Retinitis pigmentosa

Clinical consideration and PBL: Coloboma iridis, Persistent iridopupillary membrane.

Week 9 7-11 **Spring break**

Week 10 14-18

Digestive system: development of the digestive tract, derivatives of the foregut, derivatives of midgut, derivatives of hindgut,Anal canal, mesenteries.
Clinical consideration and PBL: Imperforate anus, Anal agenesis, Anorectal agenesis, Rectal atresia

Respiratory system: development of upper and lower respiratory systems, **Clinical consideration and PBL:** Congenital neonatal emphysema, Bronchiectasis, Aeration at birth, Respiratory distress syndrome (RDS), Pulmonary agenesis, Pulmonary hypoplasia

Week 11 21-25

Respiratory system **Continued:** development of upper and lower respiratory systems, Clinical considerations; Congenital neonatal emphysema, Bronchiectasis, Aeration at birth, Respiratory distress syndrome (RDS), Pulmonary agenesis, Pulmonary hypoplasia

Head and neck: Pharyngeal apparatus, development of the Thyroid gland, tongue, mouth, face, nasal cavities and palate. Cleft palate , Cleft lip, Ectopic thymus, parathyroid, thyroid tissue, Thyroglossal duct cyst, Ankyloglossia,

Clinical consideration and PBL: Pharyngeal fistula, Pharyngeal cyst, First arch syndrome, Digeorge syndrome,

April *****Lecture Exam 3 on March28***

Week 12 28-1 **Lecture Exam 3 on March28**

Urinary system: development of kidneys, urinary bladder, female urethra, male urethra, suprarenal gland. Clinical considerations: Renal agenesis, Pelvic kidney, Horseshoe kidney, Duplication of the urinary tract, Polycystic disease of the kidneys, Exstrophy of the bladder, Urachal cyst or sinus, Ectopic ureteric orifices, Pheochromocytoma , Neuroblastoma, Wilm's tumor,

Clinical consideration and PBL: Renal agenesis, Pheochromocytoma

Week 13 4-8

Male and female reproductive systems: the indifferent embryo, Development of the gonads, genital ducts, Primordia of the external genitalia, Clinical considerations: Double uterus with double vagina, Bicornuate uterus, Bicornuate uterus with rudimentary horn, Absence of uterus and vagina, Atresia of the vagina , Inersexuality, Female pseudointersexuality, male pseudointersexuality, Gonadal dysgenesis, Hypospadias, Epispadias, Undescended testes, Congenital inguinal hernia, Hydrocele of the testes.

Clinical consideration and PBL: Female pseudointersexuality, male pseudointersexuality, Gonadal dysgenesis, Hypospadias, Epispadias

Week 14 11-15

Integumentary system: development of skin, hair and nails, mammary, sweat, sebaceous glands, teeth. Skeletal system: skull: development of vertebral column, ribs, sternum, bones of the limbs and limb girdles, Osteogenesis, general skeletal abnormalities.
Mmuscular System: development of skeletal muscle, smooth muscle and cardiac muscle,

Clinical considerations and PBL: Albinism

Week 15 18-22

Upper and lower Limb development: Vasculature, Skeletal, Musculature, Nerves.
Development of Body Cavities: the intraembryonic coelom, positional changes of the diaphragm Fetal Period, monthly periods of fetal development, factors affecting fetal growth,.

Clinical considerations and PBL: viruses that affect the fetus viability of the fetus prenatal diagnostic procedures.

Week 16 25

Human birth defects, Genetic factors infectious agents, Drugs, hormones and chemical agents, Ionizing radiation

Clinical considerations and PBL: Klinefelter syndrome, Cri-du chat syndrome, Prader-Willi syndrome, Angelman syndrome, Achondroplasia, fetal-alcohol syndrome

Exam 4 (Final) Friday 5/01/2016 at 1:00 p.m.

Content of the exams might be subject to change accordingly to course progress and/or professor's discretion.

Important dates:

Jan 11: Class starts
Jan 14: Drop deadline (Thursday, until 11.59 p.m.)
Jan 15: Add deadline (Friday, until 11.59 p.m.)
Jan 18: Martin Luther King Jr. day (Monday, holiday)
March 23: Withdrawal deadline (Wednesday, until 11.59 p.m.)
March 7- 11: Spring break
April 25: Class ends (Monday, last day of classes)
Final Exam: Friday 5/01/2016 at 1:00 p.m.

The Burnett School of Biomedical Sciences
Statement on Academic Integrity

The Burnett School of Biomedical Sciences holds students to the highest standards of academic conduct. Without exception, students who violate these standards will be reported to the Office of Student Conduct. It is critical that students read and understand the Rules of Conduct described in the student handbook, "The Golden Rule."

This document describes examples of student misconduct, but the faculty of the Burnett School of Biomedical Sciences want to convey the following positive message to our students:

- The lifelong pursuit of a professional career in biomedical science and its related disciplines is achieved through one's own hard work.
- If you encounter difficulties in your courses of study, cheating is not the solution. Seek assistance from your instructor, early and often.
- If you devote the necessary energy and resources to your study, and you are prepared for the coursework, you can achieve success.

Students will be reported to the Office of Student Conduct and disciplinary action will be taken for violation of the following rules. Each rule is stated in full in the Golden Rule document. Here we provide examples that relate best to our courses and discipline.

The following (1-6) are violations of the Rules of Conduct and are prohibited:

1. Unauthorized assistance

Examples:

- A student copies another student's answers during an exam.
- A student uses notes or electronic devices during an exam when they are not allowed.
- A student obtains a lab report from another student who previously took the course, and uses the materials to complete a lab assignment for the class. Both students are in violation of the Rules of Conduct.
- Two students work together on an online assignment or exam when they were instructed to work alone.

2. Communication to another through written, visual, electronic or oral means

Example: Two students are working on an assignment in the library that the instructor has assigned as an individual assignment. One student is finished with the assignment and offers to allow the second student to use the webpage he has found which contains information related to the assignment. Both students are in violation of the Rules of Conduct.

3. Commercial use of academic material

Examples:

- A student takes an extra copy of an exam and sells it to another student.
- A student offers to sell lab reports and class notes on a website, and sells them to the highest bidder. Both the student who sold the materials and the student who purchased them are in violation of this rule.
- A student sells class notes to a note-taking service who sells these notes to other students in the course.

4. Falsifying or misrepresenting your academic work

Examples:

- Two students work together and share answers on a homework assignment where specific instructions to work alone were given.
- Two students who are lab partners shared the results of a lab session. They collaborated during the process of writing the lab report and are consequently in violation of this rule.

5. **Plagiarism: Whereby another's work is used or appropriated without any indication of the source, thereby attempting to convey the impression that such work is the student's own**

Examples:

- Text taken verbatim from any source and presented as a student's own original work, including the course book and lab manual, is plagiarism.
- Copying and pasting existing text, either through electronic means or otherwise, and editing the copied text is plagiarism.
- Quotations must be used around text taken verbatim and the source must be cited. While not plagiarism per se, the inclusion of numerous quotes is strongly discouraged, and quotes may even be prohibited by the instructor. Ask the instructor when in doubt about what is acceptable on an assignment.
- Note: Assignments will be evaluated by analytical software to detect plagiarism.

6. **Any student who knowingly assists another to violate the academic behavior standards listed above is also in violation of the Rules of Conduct**

7. **Disciplinary Actions:**

BSBS will take full disciplinary action against student misconduct.

- **Violation of any of the Rules of Conduct indicated above on an exam, assignment, or report will automatically result in a score of zero for that exam, assignment, or report and a lowering of the final grade for the course by one letter grade. Grave violations of the rules, at a minimum, may result in a final grade of F for the course.**
- **The student's misconduct will be reported to the Office of Student Conduct, which may result in additional penalties such as suspension or expulsion from UCF.**

THE UCF CREED

Integrity, scholarship, community, creativity and excellence are the core values that guide our conduct,

performance and decisions.

Integrity

I will practice and defend academic and personal honesty.

Scholarship

I will cherish and honor learning as a fundamental purpose of my membership in the UCF community.

Community

I will promote an open and supportive campus environment by respecting the rights and contributions of every individual.

Creativity

I will use my talents to enrich the human experience.

Excellence

I will strive toward the highest standards of performance in any endeavor I undertake.

UNIVERSITY OF CENTRAL FLORIDA
DEPARTMENT OF MOLECULAR BIOLOGY AND MICROBIOLOGY
BURNETT SCHOOL OF BIOMEDICAL SCIENCES & COLLEGE OF MEDICINE
ZOO 4605-Spring 2015

Course: Clinical Embryology and Congenital Malformations **Mon & Wed & Fri 3.30- 4.20 p.m.**
Location: HPA-I, room 112

Professor: **Dr. Raheleh Ahangari M.D.,** **e-m@il: rahangar@mail.ucf.edu**
Dr. Mohtashem Samsam M.D., Ph.D. **e-m@il: msamsam@mail.ucf.edu**

Office: HPA II-319; Phone (407) 823-1793

Hrs. : Mon- 11:30-12:20 2:30-3:20 p.m.
Wed- 11:30-12:20 2:30-3:20 p.m.
Fri- 2:30- 3:20 p.m.

Required Textbooks: 1- *The Developing Human, clinically oriented Embryology*. W.B. Saunders Company, 6th edition**,** by Moore and Persaud (ISBN:0-7216-6974-3).

2. Board Review Series, Embryology by Ronald W. Dudek **ISBN: 0-683-30272-8 (Recommended)**

Credits: 3

Description: Clinical embryology and congenital malformations is an advanced course focusing on the functional human embryology in a clinically oriented way to study the human development and congenital malformations as a result of genetic, environmental and toxic conditions. It will be conducted in order to integrate the macroscopic and some microscopic morphology of developing human systems. Basic understanding of biology is imperative for this course. Students will be able to describe various congenital diseases. This course is relevant for premed concentration and premed students who would like to go to medicine, dentistry or pharmacy.

Prerequisite: Human anatomy ZOO 3733C or equivalent.

Course General Objective:

After completing this course, students will be able to show significant knowledge in human clinical embryology, and relevant pathologic consequences due to congenital malformations.

- Develop effective mental processing/picturing of the adult and embryonic organs studied, in order to identify correctly and correlate the appropriate information of the material presented.
- Learn comprehensive anatomy and embryology terminology.
- Review the male and female reproductive anatomy and physiology and gametogenesis (spermatogenesis and oogenesis)
- Know the mechanisms of cell division, Meiosis and Mitosis.
- Explain major human chromosomal abnormalities and their related diseases.
- Explain all major events taking place during embryonic human development in week 1, 2, and 3-8.
- Discuss the derivatives of ectoderm, endoderm, and mesoderm.
- Explain organogenesis of all human organs.
- Discuss the mechanisms of major human congenital malformations and explain the clinical cases through problem-based learning.
- Know the diagnosis and differential diagnosis of major human congenital disorders.
- Discuss the clinical investigation and normal/abnormal maternal laboratory values on blood tests, amniotic fluid, and other investigations.
- Recognize the congenital malformations by sign and symptoms, ultrasound during development, other imaging studies after birth, the gross pathology, and histopathology.
- Discuss the surgical approaches toward treatment of congenital disorders and other treatment options.

Attendance Policy:

All students enrolled in the ZOO 4605 course are expected to attend to all programmed class meetings. Three to four (3-4), lecture combined, excused or unexcused absences to this course might adversely affect grades report. Examples of excused absences are medical situations, accidents, direct relative death, etc. In any of such circumstances, the correspondent written excuse should be presented to validate the excused condition. The fact that an absence might be excused if correspondingly evidenced, **does not** imply that it will not count for the students' absences record. *Excessive absences considering both, excused and unexcused, situation may result in withdrawn from the class.*

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legal or documented medical reasons, the grade of the final exam would be considered for either of them. Final exam is usually the more comprehensive one. There will be only **one** opportunity to make-up a missed theoretical test; if you do not attend to the reposition test as scheduled, will automatically result in a zero (0%). ***The final Exam cannot be made-up.*** *If you missed it either by tardiness or absence will result in a zero (0%).*

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Grading will be based as specified hereinafter.

Normative Exercises	Quantity	Normative (pts.)	Total pts.
Lecture Exams†	**4**	**100**	**400**
Total			**400**

† Be on time to quizzes and tests, no students will be allowed to take them once started. This will result in a zero (0) if it is the final examination.

Grading Scale:

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79-70	**C**
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LECTURES TENTATIVE SCHEDULE

WEEKS	***DATES***	***LECTURES***
	January	

1 12-16

Human Development (Days 1-7): Three phases of fertilization, Cleavage and blastocyst formation, Implantation. Clinical considerations: Ectopic tubal pregnancy, In vitro fertilization (IVF), Teratocarcinoma,

2 21-23

Human Development (Days 8-14): Further development of the embryoblast, development of the trophoblast, development of extraembryonic mesoderm. Clinical considerations: developmental malformations and Human chorionic gonadotropin (hCG), Oncofetal antigens, Carcinoembryonic antigen (CEA), Alpha-fetoprotein, RU-486(mifepristone)

3 26-30

Embryonic Period (Week 3-8): General considerations, development of the embryoblast, angiogenesis (blood vessel formation), hematopoiesis. Clinical considerations: Sacrococcygeal teratoma, Chordoma, Caudal dysplasia, Missed menstrual period. ***** Exam 1*** **Feb. 2**

February

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4 2-6

Development of Cardiovascular System: development of the heart, development of the arterial system, development of the venous system, fetal blood circulation.

5 9-13

Clinical considerations: developmental malformations of the heart and cardiovascular system: Double inferior vena cava, Left superior vena cava, Double superior vena cava, Absence of the hepatic portion of the inferior vena cava, Atrial septal defect, Ventricular septal defect, Fallot tetralogy

6 16-20

Placenta and Amniotic Fluid: formation of the placenta, placental components : Decidua basalis and villous chorion, appearance of the placenta in afterbirth, functions of the placenta, placenta membrane, umbilical cord circulatory system of the fetus amniotic fluid. Clinical considerations: Complete hydatidiform mole, Choriocarcinoma, Premature rupture of the amniochorionic membrane, Amniotic band syndrome, Abnormal placental shapes, placenta previa , Placental abruption , Erythroblastosis fetalis, Oligohydramnios, Polyhydramnios, Twinning, developmental anomalies and Alpha –fetoprotein.

*****Lecture exam 2 Feb. 23***

7 23-27

Nervous System: development of the neural tube, neural crest, placodes, stages of neural tube development, Development: of the spinal cord, myelencephalon, metencephalon, mesencephalon, diencephalons , optic structures, and hypophysis, telencephalon, autonomic nervous system, cranial nerves, choroids plexus. Congenital malformations of the central nervous system **:** Spina bifida, Ossification defects of the occipital bone(cranium bifidum) , anencephaly(meroanencephaly), Arnold-Chiari malformation, Dandy Walker syndrome, Hydrocephalus, Porencephaly, False Porencephaly, Hydranecephaly, Holoprosencephaly , Megacolon (Hirschsprungs disease), Tethered spinal cord (filum terminale syndrome)

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8 2-6

Ear: development of Internal ear, Middle ear, External ear. Congenital malformations of the ear: Congenital deafness, Malformation of the auricles in chromosomal syndromes, Atresia of the external auditory meatus, Congenital cholesteatoma

Eye: development of optic vesicle and other eye structures. Congenital malformations of the eye: Coloboma iridis, Persistent iridopupillary membrane, Congenital cataracts,
Glaucoma ,Microphthalmia, Anophthalmia ,Cyclopia Retinocele Retrolental fibroplasias , Detached retina Papilledema Retinitis pigmentosa

9 9-13 **Spring break**

10 16-20 Digestive system: development of the digestive tract, derivatives of the foregut, derivatives of midgut, derivatives of hindgut,
Anal canal, mesenteries. Clinical considerations: Imperforate anus, Anal agenesis, Anorectal agenesis, Rectal atresia

Respiratory system: development of upper and lower respiratory systems, Clinical considerations; Congenital neonatal emphysema, Bronchiectasis, Aeration at birth, Respiratory distress syndrome (RDS), Pulmonary agenesis, Pulmonary hypoplasia

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11 23-27

Respiratory system **Continued:** development of upper and lower respiratory systems, Clinical considerations; Congenital neonatal emphysema, Bronchiectasis, Aeration at birth, Respiratory distress syndrome (RDS), Pulmonary agenesis, Pulmonary hypoplasia

Head and neck: Pharyngeal apparatus, development of the Thyroid gland, tongue, mouth, face, nasal cavities and palate. Clinical considerations: Pharyngeal fistula, Pharyngeal cyst, First arch syndrome, Digeorge syndrome, Ectopic thymus, parathyroid, thyroid tissue, Thyroglossal duct cyst, Ankyloglossia, Cleft palate, Cleft lip ,

April ****Lecture Exam 3 on March30***

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12 30-3

Urinary system: development of kidneys, urinary bladder, female urethra, male urethra, suprarenal gland. Clinical considerations: Renal agenesis, Pelvic kidney, Horseshoe kidney, Duplication of the urinary tract, Polycystic disease of the kidneys, Exstrophy of the bladder, Urachal cyst or sinus, Ectopic ureteric orifices, Pheochromocytoma , Neuroblastoma, Wilm's tumor,

13 6-10

Male and female reproductive systems: the indifferent embryo, Development of the gonads, genital ducts, Primordia of the external genitalia, Clinical considerations: Double uterus with double vagina, Bicornuate uterus, Bicornuate uterus with rudimentary horn, Absence of uterus and vagina, Atresia of the vagina , Inersexuality, Female pseudointersexuality, male pseudointersexuality, Gonadal dysgenesis, Hypospadias, Epispadias, Undescended testes, Congenital inguinal hernia, Hydrocele of the testes.

14 13-17

Integumentary system: development of skin, hair and nails, mammary, sweat, sebaceous glands, teeth. Clinical considerations: Albinism,

Skeletal system: skull: development of vertebral column, ribs, sternum, bones of the limbs and limb girdles, Osteogenesis, general skeletal abnormalities.
Mmuscular System: development of skeletal muscle, smooth muscle and cardiac muscle,

15 20-24

Upper and lower Limb development: Vasculature, Skeletal, Musculature, Nerves.
Development of Body Cavities: the intraembryonic coelom, positional changes of the diaphragm.
Clinical considerations: Fetal Period, monthly periods of fetal development, factors affecting fetal growth, viruses that affect the fetus viability of the fetus prenatal diagnostic procedures, ,

16 27 Human birth defects, Genetic factors infectious agents, Drugs, hormones and chemical agents, Ionizing radiation

**Exam 4 (Final) 5/1/2014 at 1:00 p.m.

- Content of the exams might be subject to change accordingly to course progress and/or professor's discretion.

Important dates:

Jan 12: Class starts
Jan 15: Drop deadline (Thursday, until 11.59 p.m.)
Jan 16: Add deadline (Friday, until 11.59 p.m.)
Jan 19: Martin Luther King Jr. day (Monday, holiday)
March 24: Withdrawal deadline (Tuesday, until 11.59 p.m.)
March 9- 13: Spring break
April 27: Class ends (Monday, last day of classes)

The Burnett School of Biomedical Sciences
Statement on Academic Integrity

The Burnett School of Biomedical Sciences holds students to the highest standards of academic conduct. Without exception, students who violate these standards will be reported to the Office of Student Conduct. It is critical that students read and understand the Rules of Conduct described in the student handbook, "The Golden Rule."

This document describes examples of student misconduct, but the faculty of the Burnett School of Biomedical Sciences want to convey the following positive message to our students:

- The lifelong pursuit of a professional career in biomedical science and its related disciplines is achieved through one's own hard work.
- If you encounter difficulties in your courses of study, cheating is not the solution. Seek assistance from your instructor, early and often.
- If you devote the necessary energy and resources to your study, and you are prepared for the coursework, you can achieve success.

Students will be reported to the Office of Student Conduct and disciplinary action will be taken for violation of the following rules. Each rule is stated in full in the Golden Rule document. Here we provide examples that relate best to our courses and discipline.

The following (1-6) are violations of the Rules of Conduct and are prohibited:

1. **Unauthorized assistance**
   Examples:

- A student copies another student's answers during an exam.
  - A student uses notes or electronic devices during an exam when they are not allowed.
  - A student obtains a lab report from another student who previously took the course, and uses the materials to complete a lab assignment for the class. Both students are in violation of the Rules of Conduct.
  - Two students work together on an online assignment or exam when they were instructed to work alone.

2. **Communication to another through written, visual, electronic or oral means**
   Example: Two students are working on an assignment in the library that the instructor has assigned as an individual assignment. One student is finished with the assignment and offers to allow the second student to use the webpage he has found which contains information related to the assignment. Both students are in violation of the Rules of Conduct.

3. **Commercial use of academic material**
   Examples:
   - A student takes an extra copy of an exam and sells it to another student.
   - A student offers to sell lab reports and class notes on a website, and sells them to the highest bidder. Both the student who sold the materials and the student who purchased them are in violation of this rule.
   - A student sells class notes to a note-taking service who sells these notes to other students in the course.

4. **Falsifying or misrepresenting your academic work**
   Examples:
   - Two students work together and share answers on a homework assignment where specific instructions to work alone were given.
   - Two students who are lab partners shared the results of a lab session. They collaborated during the process of writing the lab report and are consequently in violation of this rule.

5. **Plagiarism: Whereby another's work is used or appropriated without any indication of the source, thereby attempting to convey the impression that such work is the student's own**
   Examples:
   - Text taken verbatim from any source and presented as a student's own original work, including the course book and lab manual, is plagiarism.
   - Copying and pasting existing text, either through electronic means or otherwise, and editing the copied text is plagiarism.
   - Quotations must be used around text taken verbatim and the source must be cited. While not plagiarism per se, the inclusion of numerous quotes is strongly discouraged, and quotes may even be prohibited by the instructor. Ask the instructor when in doubt about what is acceptable on an assignment.
   - Note: Assignments will be evaluated by analytical software to detect plagiarism.

6. **Any student who knowingly assists another to violate the academic behavior standards listed above is also in violation of the Rules of Conduct**

7. **Disciplinary Actions:**
   BSBS will take full disciplinary action against student misconduct.
   - **Violation of any of the Rules of Conduct indicated above on an exam, assignment, or report will automatically result in a score of zero for that exam, assignment, or report and a lowering of the final grade for the course by one letter grade. Grave violations of the rules, at a minimum, may result in a final grade of F for the course.**
   - **The student's misconduct will be reported to the Office of Student Conduct, which may result in additional penalties such as suspension or expulsion from UCF.**

THE UCF CREED

Integrity, scholarship, community, creativity and excellence are the core values that guide our conduct,

performance and decisions.

Integrity

I will practice and defend academic and personal honesty.

Scholarship

I will cherish and honor learning as a fundamental purpose of my membership in the UCF community.

Community

I will promote an open and supportive campus environment by respecting the rights and contributions of every individual.

Creativity

I will use my talents to enrich the human experience.

Excellence

I will strive toward the highest standards of performance in any endeavor I undertake.

Course Agenda

1. Course Additions

College of Engineering and Computer Science Course Additions

CWR 6XXX **ECS-CECE** **3(3,0)**
Stochastic River Network Hydro-Geomorpholgy: PR: CWR 5125, CWR 5205, CWR 5545, CWR 5634 or C.I. Review of Probability and Statistics, Fourier and Wavelet Analysis, Fractal Characteristics of River basins, Self-organization, Modeling River Basins, River Basin response to Climatic and Anthropogenic Changes *Odd Spring.*
Abbrev: (19 of 30 chars) SRN Hydro-Geomorph.
Rationale: The instructor is developing a course in his area of research that is not currently offered in the department. The course objective is to provide Water Resources graduate students knowledge of the modeling techniques employed in River Basin hydrology and geomorphology modeling and research. The course is modeled along the lines of similar courses in Water Resources at the University of Minnesota and Princeton University.

COP 5XXX **ECS-CS** **3(3,0)**
Software Development Leadership: PR: COP 4331C and Computer Science major. The course teaches the concepts necessary to manage software projects successfully, with a focus on software quality, effective development practices, team dynamics, appropriate leadership style. *Fall.*
Abbrev: (26 of 30 chars) Software Devel. Leadership
Discussion with others: We discussed this course with Departments of: Industrial Engineering and Management Systems, Management, Modeling and Simulation, and Electrical and Computer Engineering (ECE). There were no duplications and conflicts found. ECE wanted a 5000-level prerequisite, but agreed to this CAR with the stipulation that the course is limited to CS majors. There were no other objections to this CAR and the proposed course syllabus. The course syllabus has been refined and focused per the suggestions of Dr. Damla Turgut, a CS professor who teaches software engineering courses in the ECE catalog.
Rationale: The course will introduce the key concepts for software development leadership necessary for creating quality software, managing and working with software development teams, improving the leadership and communication skills in software design projects, and developing strategies for career growth in the field of computer and software engineering.

College of Graduate Studies Course Additions

IDS 6XXX **GRDST-INTERDIS** **3(3,0)**

Research Design for Modeling and Simulation: PR or CR: IDS 6148; PR: IDS 6XXX Simulation Techniques. Theoretical and practical aspects of interdisciplinary research methodologies as they relate to human-centered Modeling and Simulation. *Fall.*
Abbrev: (29 of 30 chars) Research Design for Mod & Sim
Discussion with others: not applicable
Rationale: Modeling and Simulation is growing to become its own field, which necessitates methodological training for students.
Majors taking course: Mod & Sim MS and PhD

IDS 6XXX GRDST-INTERDIS 3(3,0)
Simulation Techniques: PR: DIG 5876 or ESI 5219 or STA 5205 or C.I. Foundations, examples, hands-on tools to implement solutions to various problems using three different categories of simulation: discrete event simulation, continuous simulation, and agent-based simulation. *Spring.*
Abbrev: (21 of 30 chars) SIMULATION TECHNIQUES
Discussion with others: UCF has some individual, separate courses for each of the simulation techniques to be covered in this course, but no unit has a single course which addresses all of them as a broad survey such as what we propose with this course.
Rationale: This course is being added in response to a recommendation from external consultants that was part of our recent 7-year review. It is important to create a course that will be required for Modeling and Simulation students to learn the 3 major simulation techniques so they know when to use each one depending on applications/problems. Also, program revision is coming soon to add this as a required core course.
Majors taking course: Modeling and Simulation MS and PhD

IDS 6XXX GRDST-INTERDIS 3(3,0)
Fundamentals of Nano Biophysics: PR: Admission to the PSM or MS in Nanotechnology or C.I. Integrates interdisciplinary approaches covering physics, biology and nanoscience to understand how living systems work at the nanoscale. *Spring.*
Abbrev: (28 of 30 chars) Fundamentals Nano Biophysics
Discussion with others: Contacting Physics department
Rationale: Changing the special topic course to a permanent course to be offered as an elective in Professional Science Master's (PSM) and Master of Science degree programs in Nanotechnology.
Majors taking course: PSM and MS programs in Nanotechnology

IDS 6XXX GRDST-INTERDIS 3(3,0)
Semiconductor Quantum Wells, Dots and Wires: PR: Admission to the PSM or MS in Nanotechnology or C.I. Introduction to low dimensional semiconductor devices based on quantum wells, dots and wires; approximate and numerical device modeling. *Fall.*
Abbrev: (30 of 30 chars) Semiconductor wells,dots&wires
Rationale: Changing the special topic course to a permanent course to be offered as an elective in Professional Science Master's (PSM) and Master of Science degree programs in Nanotechnology.
Majors taking course: PSM and MS programs in Nanotechnology

IDS 6XXX GRDST-INTERDIS 3(3,0)
Nanotechnology for Sustainable Agriculture: PR: Admission to the PSM or MS in Nanotechnology or C.I. Prepares a new generation of STEM students who are equipped with necessary knowledge to adapt sustainable agricultural practices. *Fall.*
Abbrev: (30 of 30 chars) Nanotech for Sustainable Agric
Discussion with others: No conflict has been identified. This course is offered to students willing to pursue higher studies in agriculture (crop protection, horticulture, food science) or willing to work with agro-chemical industries. Traditional chemists or materials scientists are not adequately trained to join agricultural industries as they have limited exposure and knowledge in the field.
Rationale: No such course available at UCF to prepare students for agro-chemical job market.
Majors taking course: Recommended for students in PSM and MS programs in Nanotechnology

IDS 6XXX GRDST-INTERDIS 3(3,0)
Advanced Materials and Nanotechnology for Rechargeable Batteries: PR: Admission to the PSM or MS in Nanotechnology or C.I. Builds a bridge between nano materials and electrochemical energy storage performance and demonstrates renewable energy storage on the nanoscale. *Spring.*
Abbrev: (29 of 30 chars) Adv Mat Nanotech Recharg Batt
Discussion with others: Dr. Yang contacted the Electrical Engineering department. He received response from Dr. Qu and Dr. Sundaram that this course does not overlap with any EEE or EEL courses.
Rationale: Changing the special topic course to a permanent course to be offered as an elective in Professional Science Master's (PSM) and Master of Science degree programs in Nanotechnology.
Majors taking course: PSM and MS in Nanotechnology

IDS 6XXX GRDST-INTERDIS 3(3,0)
Introduction to Electrochemical Energy Conversion and Storage: PR: Admission to the PSM or MS in Nanotechnology or C.I. Topics in nanotechnology, materials science and electrochemistry concerning renewable energy generation and storage. Electrochemical systems and their applications in renewable energy generation and storage. *Fall.*
Abbrev: (30 of 30 chars) Intro to Elec Ener Conv & Stor
Discussion with others: Dr. Yang contacted the Electrical Engineering department and provided a syllabus for the new course. He received response from Dr. Kalthpathy Sundaram that there is no overlap with any EEE or EEL courses.
Rationale: Changing the special topic course to a permanent course to be offered as an elective in Professional Science Master's (PSM) and Master of Science degree programs in Nanotechnology.
Majors taking course: PSM and MS programs in Nanotechnology

IDS 6XXX GRDST-INTERDIS 3(3,0)
Advanced Energy-Efficient Nanoelectronic Devices: PR: Admission to the PSM or MS in Nanotechnology or C.I. Discusses low power nanoelectronic devices that can meet the need of future electronics by using novel physical mechanisms of current conduction. *Occasional.*

Abbrev: (26 of 30 chars) Adv Ener Eff Nanoelec Devs
Discussion with others: PHY 5704 Physics of Nanoelectronic Devices: Had thorough discussion with Professor Saiful Khondaker to avoid any overlap between the two courses. While PHY 5704 discusses the physics of several nanoelectronic devices, this course would focus on the design and working of the latest technology innovations for minimizing power consumption for future generation electronics.
Rationale: This course is a new elective course for the recently established Professional Science Master's (PSM) and Master of Science programs in Nanotechnology.
Majors taking course: PSM and MS programs in Nanotechnology

IDS 6XXX **GRDST-INTERDIS** **3(3,0)**
Properties of Materials at Nanoscale: PR: Admission to the PSM or MS in Nanotechnology or C.I. Aims to integrate multidisciplinary approaches covering materials science and nanosciences to understand how intrinsic properties of materials are governed by their structural variations at nanoscales. *Spring.*
Abbrev: (30 of 30 chars) Prop of Materials at Nanoscale
Rationale: As the development of new nanomaterials and their application to emerging technologies are progressively changing our daily life, it is very important for students to acquire a basic understanding and knowledge of how/why materials behave differently at nanoscales. This newly developed course aims to integrate multidisciplinary approaches covering materials science and nanosciences to understand how the intrinsic properties of materials are governed by their structural variations, a subject that has not been covered by any existing courses offered from outside the department.
Majors taking course: PSM and MS programs in Nanotechnology, Materials Science

College of Medicine Course Additions

ZOO 5XXX **COM-BSBS** **3(3,0)**
Clinical Embryology and Congenital Malformations: PR: ZOO 3733C or equivalent. Functional human embryology in a clinically oriented way to study the human development and congenital malformations as a result of genetic, environmental and toxic conditions. *Spring, Summer.*
Abbrev: (28 of 30 chars) Clinical Embryology Cong Mal
Rationale: ZOO 4605 Clinical Embryology and Congenital Malformations is an advanced course currently only offered to undergraduate students. We propose to add a graduate section to this course so that it may be included as one of the key elective courses available to students in a new "Integrated Medical Sciences" ("IMS") track that we are developing in our Biomedical Sciences MS (nonthesis) Program. The IMS track is being developed to provide students with an opportunity to enhance their knowledge and skills in preparation for careers in the health sciences professions. Students accepted into this program will take a combination of first-year medical school courses together with graduate courses in biomedical sciences.
Majors taking course: Neuroscience M.S.

MDE 8XXX **COM-MED** **6(6,0)**

Elective in Gynecology: PR: Completion of the M3 year. The Gynecology elective is available to 4th year medical students to acquire a comprehensive experience with commonly treated gynecologic issues for women. The experience will include performing inpatient and emergency gynecologic consultations, attending outpatient clinics, assisting in the operating room with gynecologic cases and participating in following gynecologic patients with breast disorders in the breast clinic. *Spring, Summer, Fall.*
Abbrev: (22 of 30 chars) Elective in Gynecology
Majors taking course: None

MDE 8XXX **COM-MED** **6(6,0)**
Obstetrics and Gynecology Ambulatory Elective: PR: Completion of the M3 year. The Ob/Gyn Ambulatory elective is available to 4th year medical students to acquire a comprehensive experience in obstetrics and gynecology. The experience will be both outpatient and inpatient and include participation in all aspects of care for women. The student will participate in obstetric and gynecologic consultations, attending outpatient clinics, assisting in the operating room with obstetric and gynecologic cases, and participating in pre-op and post-op care. *Spring, Summer, Fall.*
Abbrev: (26 of 30 chars) Ob/Gyn Ambulatory Elective
Majors taking course: none

MDE 8XXX **COM-MED** **6(6,0)**
Pediatric Anesthesia Elective: PR: Completion of the M3 year. This two- or four-week elective rotation, open to fourth year medical students, will provide a broad learning experience in pediatric anesthesiology. *Spring, Summer, Fall.*
Abbrev: (24 of 30 chars) Peds Anesthesia Elective
Majors taking course: none

MDE 8XXX **COM-MED** **6(6,0)**
Otolaryngology - Head and Neck Surgery Elective: PR: Completion of the M3 year. This excellent rotation is led by internationally respected surgeons skilled in Otologic/Neurolotogic head & neck surgery. Students work with 5 surgeons to learn the basics of Oto-HNS surgery. *Spring, Summer, Fall.*
Abbrev: (24 of 30 chars) Oto-HNS Surgery Elective
Majors taking course: None

MDE 8XXX **COM-MED** **6(6,0)**
Pediatric/Adolescent Gynecology Elective: PR: Completion of the M3 year. The pediatric and adolescent gynecology elective is designed to expose medical students to the full spectrum of gynecologic services for the pediatric and adolescent population while remaining within a developmentally appropriate, supportive environment. Students will also participate in the surgical management of endometriosis and ovarian cysts. *Spring, Summer, Fall.*
Abbrev: (28 of 30 chars) Peds/Adolescent Gyn Elective
Majors taking course: None

MDI 8XXX **COM-MED** **6(6,0)**

Acting Internship in Clinical Neurological Ophthalmology: PR: Completion of the M3 year. An eye clinic based experience where students will master ophthalmoloscopy, ophthalmic examination skills, and participate in general and specialty eye surgery and clinics. *Spring, Summer, Fall.*
Abbrev: (28 of 30 chars) AI in Clinical Neuro Ophthal
Majors taking course: None

MDI 8XXX **COM-MED** **6(6,0)**
Acting Internship in Consultation Liaison Psychiatry : PR: Completion of the M3 year. As acting interns, M4 students will be given progressive clinical responsibilities in the assessment and treatment of patients hospitalized on medical and surgical wards at the Lake Nona Orlando V.A. Medical Center that have concomitant psychiatric conditions. *Spring, Summer, Fall.*
Abbrev: (29 of 30 chars) AI in Consultation Psychiatry
Majors taking course: None

MDI 8XXX **COM-MED** **6(6,0)**
Acting Internship in Emergency Psychiatry: PR: Completion of the M3 year. As acting interns, M4 students will be given progressive clinical responsibilities in the psychiatric assessment and treatment of patients presenting for urgent care at the Lake Nona Orlando V.A. Medical Center Emergency Room. *Spring, Summer, Fall.*
Abbrev: (26 of 30 chars) AI in Emergency Psychiatry
Majors taking course: none

2. Special Topics Additions

3. Course Revisions

College of Business Administration Course Revisions

FIN 6465 **Financial Analysis Seminar** **~~var(1.5-3,0)~~ 3(3,0)**

PR: Graduate ~~Standing.~~ standing.
Seminar in financial analysis; examining financial statements, annual reports and other sources of information. Not open to students who have completed or are enrolled in GEB 6895.
Rationale: Changing from variable hours to 3 credit hours as that is the only way the course is offered.
Majors taking course: MBA Elective
There are no programs that list FIN 6465.

College of Engineering and Computer Science Course Revisions

CWR 5125 **Groundwater Hydrology** **3(3,0)**
PR: CWR ~~4633C~~ 4124C or C.I.
Theories of groundwater movement, geological factors, analysis and design techniques, etc. Emphasis on practical considerations.
Rationale: Only prerequisites changing due to changes in undergraduate curriculum. Nothing else is changing.
There are no programs that list CWR 5125.

CWR 5205 **Hydraulic Engineering** **3(3,0)**
PR: CWR ~~4633C~~ 4202C or C.I.
Concepts of fluid mechanics and hydrodynamics applied to natural and man-made flow of intent to civil and environmental engineering.
Rationale: Only prerequisites changing due to changes in undergraduate curriculum. Nothing else is changing.
There are no programs that list CWR 5205.

CWR 5515 **Numerical Methods in Civil and Environmental Engineering** **3(3,0)**
PR: CWR ~~4633C~~ 4202C or C.I.
This course will present intermediate to advanced numerical methods theory and include code development and error assessment, while targeting civil and environmental engineering applications.
Rationale: Only prerequisites changing due to changes in undergraduate curriculum. Nothing else is changing.
There are no programs that list CWR 5515.

CWR 5634 **Water Resources in a Changing Environment** **3(3,0)**
PR: CWR ~~4632C.~~ 4120.
To model and understand potential impact of climate change and human activities on hydriodic systems and various spatial and temporal scales.
Rationale: Only prerequisites changing due to changes in undergraduate curriculum. Nothing else is changing.
There are no programs that list CWR 5634.

CWR 6102 **Advanced Hydrology** **3(3,0)**
PR: CWR ~~4633C~~ 4120C or C.I.
Single site and regional frequency analysis; modeling hydrologic systems; lumped and distributed event models for urban and natural drainage basins; continuous simulation; real-time forecasting.
Rationale: Only prerequisites changing due to changes in undergraduate curriculum. Nothing else is changing.
There are no programs that list CWR 6102.

CWR 6535 **Modeling Water Resources Systems** **3(3,0)**

PR: CWR ~~4633C~~ 4120 or C.I.
Contemporary mathematical models for water quality and quantity considerations including computer-based hydraulic and hydrologic models.
Rationale: Only prerequisites changing due to changes in undergraduate curriculum. Nothing else is changing.
There are no programs that list CWR 6535.

College of Nursing Course Revisions

NGR 5003L	**~~Advanced Health Assessment and Diagnostic Reasoning (Lab)~~ Advanced Health Assessment and Diagnostic Reasoning Lab**	**1(0,1)**

PR: or CR: NGR 5141; CR: NGR 5003. Admission to the M.S. in Nursing or Doctor ~~of~~ of Nursing Practice tracks or C.I.
Application of concepts and skills for advanced health assessment and diagnostic reasoning over the ~~lifespan Graded S/U.~~ lifespan. May be used in the degree program a maximum of 2 times.
Graded SU: ~~Yes~~ No
Rationale: Students are not submitting work of the highest quality possible. Letter grade will improve the quality of work students submit.
There is 1 program that lists NGR 5003L: Nursing - R.N. to M.S.N. Option (B.S.N./M.S.N.)

4. Course Deletions

College of Business Administration Course Deletions

BUL 5810 **BA-ACCT** **3(3,0)**
Legal and Social Environment of Business PR: Admission to graduate program. Analysis of the legal and ethical environment of business, the effects of legislation and regulation on business activity, and the role of law and ethics in the decision-making process.
Discussion with others: No conflicts
Rationale: This course has not been taught in 5 years.
There are no programs that list BUL 5810.

TAX 6205 **BA-ACCT** **3(3,0)**
Partnership Taxation PR: TAX 4001 and graduate standing. Federal taxation relating to partnership income including formation, distribution, and retirements.
Rationale: This course has not been taught for 5 years.
There are no programs that list TAX 6205.

TAX 6505 **BA-ACCT** **3(3,0)**

International Taxation PR: TAX 4001 and graduate standing. Study of federal tax issues related to international transactions affecting U.S. and foreign taxpayers.
Rationale: The course has not been taught in 5 years.
There are no programs that list TAX 6505.

College of Engineering and Computer Science Course Deletions

ENV 6055 **ECS-CECE** **3(3,0)**
Fate and Transport of Subsurface Contaminants PR: EES 4111C, EES 4202C, CWR 5125. Principal concepts and modeling of the physical, chemical, and biological transport and transformation processes for subsurface contaminants.
Rationale: The department no longer plan to offer this course.
There are no programs that list ENV 6055.

ENV 6504L **ECS-CECE** **3(1,6)**
Unit Operation and Processes Laboratory PR: ENV 6015 or equivalent. Bench and small pilot plant experimentation with sedimentation, coagulation, sorption gas-stripping, oxidation ion-exchange, etc. in water, waste-water industrial waste, or hazardous waste treatment.
Rationale: The department no longer plan to offer this course.
There are no programs that list ENV 6504L.

College of Medicine Course Deletions

MDE 8092 **COM-MED** **6(6,0)**
Foundation of Academic Education PR: UCF COM Students only. The didactic part of the module will be covered during M1 and M2 years. Students will spend their assigned time during M4 to complete their practicum. This elective introduces medical students to academic medicine and educational research. This course covers major educational theories, instructional design, teaching and assessment methods.
Rationale: This course has not been used in over 5 years and it is not anticipated that it will be active any time in the near future.
There are no programs that list MDE 8092.

MDE 8884 **COM-MED** **6(6,0)**
Geriatrics Psychiatry at VA PR: Successful completion of M3 core clerkships. Responsibility of clinical assessment and treatment planning for geriatric psychiatry patients at the VA Community Living Center.
Rationale: This course has not been used in over 5 years and it is not anticipated that it will be active any time in the near future.
There are no programs that list MDE 8884.

College of Optics and Photonics Course Deletions

OSE 5630C **OPT-OPT** **3(2,1)**

Thin Film Optics PR: PHY 4424 or EEL 4440 and OSE 5041 or OSE 5630C. Principles of thin film optics and its applications in optical, electro-optical, and laser systems.
Discussion with others: None
Rationale: Has not been taught in at least 6 years. No plans to teach in the future. No current faculty members are available to teach.
There are no programs that list OSE 5630C.

5. Course Continuations

College of Business Administration Course Continuations

TAX 6135 **BA-ACCT** **3(3,0)**
Taxation of Corporations and Shareholders PR: TAX 4001 and graduate standing. Federal taxation relating to corporate organization, distributions, liquidations, accumulations, and reorganizations.
Rationale: This course will be used in the future as an elective for the Master of Science in Accounting program.
There are no programs that list TAX 6135.

TAX 6405 **BA-ACCT** **3(3,0)**
Taxation of Estates and Gifts PR: TAX 4001 and graduate standing. Federal transfer taxes affecting gifts and estates.
Rationale: This course will be used in the future as an elective for the Master of Science in Accounting program.
There are no programs that list TAX 6405.