GRADUATE COUNCIL AGENDA
JUNE 20, 2024
1:00 PM

VIA ZOOM

I. ACTION ITEMS:

1. Minutes from the May 16, 2024, Graduate Council Meeting (Enclosure 1)

CERTIFICATE:

2. The College of the Arts seeks to modify the number of credit hours required for the graduate certificate in Curatorial Studies (#19058). Dr. Elizabeth Ross will be present for discussion. (Enclosure 2)

CONCENTRATIONS:

3. The College of Medicine seeks to create a new concentration in Medical Pharmacology and Toxicology for the Master of Science (M.S.) with a major in Medical Sciences (#19940). Dr. Oliver Grundmann will be present for discussion. (Enclosure 3)

4. The College of Medicine seeks to modify the admissions requirements and change the name of the concentration in "Gerontology" to "Innovative Aging Studies" for the Master of Science (M.S.) with a major in Medical Sciences (#19946). Dr. Peter Sayeski will be present for discussion. (Enclosure 4)

5. The College of Liberal Arts and Sciences seeks to close the concentration in Imaging Science and Technology for the Doctor of Philosophy (Ph.D.) with a major in Mathematics (#19562). Dr. Michael Jury will be present for discussion. (Enclosure 5)

MAJOR:

6. The College of Medicine seeks to create a major in Artificial Intelligence in Biomedical and Health Sciences for the Master of Science (M.S.) (#19698). Dr. Elizabeth Palmer will be present for discussion. (Enclosure 6)

EXPIRATION OF FINAL EXAM POLICY:

7. Extending the expiration on the final exam from six months to three semesters, including the term in which the exam is taken. (Enclosure 7)

II. INFORMATION ITEM / ADMINISTRATIVE ACTIONS:

8. Graduate Curriculum Committee – May Minutes and June Agenda (Enclosure 8)

9. Graduate Programs – Distance or Self-Supporting
   - Master of Arts in Mass Communication degree with a major in Mass Communication and a concentration in Digital Journalism and Multimedia Storytelling
   - Master of Science degree with a major in Medical Sciences with a concentration in Medical Anatomy and Physiology

10. Graduate Student Success Center

GRADUATE COUNCIL MINUTES
MAY 16, 2024
1:00 PM

110 GRINTER HALL
Teleconference (Via Zoom)

MEMBERS PRESENT: Dr. Linda Bloom, Dr. James Essegbey, Dr. Hitomi Greenslet, Dr. Michael Martinez, Dr. Corene Matyas, Dr. Connie Mulligan, Dr. K. Ramesh Reddy, Dr. Joni Williams Splett, and Kevin Senior (GSC rep)

MEMBERS ABSENT: Dr. Nicole Stedman (Chair), Dr. J.C. Bunch, Dr. Kristin Larsen, Dr. Aner Sela, Dr. Marta Wayne, and Jasleen Kaur (GSC alternate)

GUESTS PRESENT: Stephen Bender (College of Design, Construction and Planning), Dr. Keith Benson (College of Public Health and Health Professions), Dr. George Hack (College of Public Health and Health Professions), Dr. Evan Kropp (College of Journalism and Communications), Tammy Lee (College of Dentistry), Dr. Maria Leite (Academic Affairs), Dr. Karla Saldana Ochoa (College of Design, Construction and Planning), Cheryl Oberlin (College of Journalism and Communications), Dr. Johnathan Orsini (Office of the Provost/Teaching and Technology), Dr. Margaret Portillo (College of Design, Construction and Planning), Dr. Denise Simmons (Herbert Wertheim College of Engineering), Dr. Ravi Srinivasan (College of Design, Construction and Planning), Dr. Lissette Toletino (Office of Institutional Assessment), and Ashley Tidwell (Office of Admissions)

STAFF PRESENT: Dr. Tom Kelleher, Megan Lewis, Hannah Potter, Dr. Lerah Sutton, Frankie Tai (Recording), Dr. Judy Traveis, and Stacy Wallace

The meeting was called to order at 1:00 p.m.

Dr. Kelleher welcomed everyone to this month's meeting of the Graduate Council and gave a brief summary of the pending proposals to be presented to the Council. (Prior to calling the meeting to order, Dr. Kelleher informed everyone that today's Zoom meeting was being recorded.)

I. ACTION ITEMS:

1. Minutes from the April 18, 2024, Graduate Council Meeting (Enclosure 1).

CERTIFICATES:

2. The College of Design, Construction and Planning seeks to create a graduate certificate in AI in Architecture (#19843). Dr. Karla Saldana Ochoa was present for discussion. A motion to approve was made, seconded, and passed unanimously, with a proposed effective date of earliest available 2024.

3. The College of Design, Construction and Planning seeks to create a graduate certificate in Healthcare Design Integration (#19815). Stephen Bender was present for discussion. A motion to approve was made, seconded, and passed unanimously, with a proposed effective date of earliest available.

CONCENTRATIONS:

4. The College of Dentistry seeks to add the project in lieu of thesis as an option to the concentrations in Periodontics and Operative and Esthetic Dentistry for the Master of Science (M.S.) degree with a major

in Dental Sciences (#19757). Tammy Lee was present (via Zoom) for discussion. A motion to approve was made, seconded, and passed unanimously, with a proposed effective date of fall 2024.

5. The College of Journalism and Communications seeks to modify the curriculum for the graduate concentration in Web Design and Online Communication for the Master of Arts in Mass Communication (M.A.M.C.) with a major in Mass Communication (#19778). Dr. Evan Kropp and Cheryl Oberlin were present (via Zoom) for discussion. A motion to approve was made, seconded, and passed unanimously, with a proposed effective date of spring 2025.

6. The College of Liberal Arts and Sciences seeks to close the concentration in Quantitative Finance for the Doctor of Philosophy (Ph.D.) with a major in Mathematics (#19561). Dr. Tom Kelleher was present for discussion. A motion to approve was made, seconded, and passed unanimously, with a proposed effective Termination Term of summer 2024 and Phase-Out Term of summer 2024.

MAJOR MODIFICATION:

7. The College of Medicine seeks to reduce the amount of credit for the Master of Science (M.S.) with a major in Genetics and Genomics (#19840). Dr. Connie Mulligan was present (via Zoom) for discussion. A motion to approve was made, seconded, and passed unanimously, with a proposed effective date of earliest available.

DEGREE:

8. The College of Public Health and Health Professions seeks to modify the curriculum for the Master of Health Administration (M.H.A.) (#19867). Dr. George Hack and Dr. Keith Benson were present for discussion. A motion to approve was made, seconded, and passed unanimously, with a proposed effective date of earliest available.

ONLINE MODALITIES:

9. The Herbert Wertheim College of Engineering seeks to offer various levels of online modality for the following existing Ph.D. majors: Aerospace Engineering, Civil Engineering, Coastal and Oceanographic Engineering, Environmental Engineering Sciences, Materials Science and Engineering, Mechanical Engineering, and Nuclear Engineering Sciences. (#19991). Dr. Denise Simmons was present (via Zoom) for discussion. A motion to approve was made, seconded, and passed unanimously, with a proposed effective date of earliest available.

NOMINEES FOR GRADUATE CURRICULUM COMMITTEE:

10. Graduate Curriculum Committee Nominations. The Graduate Council approved new members Dr. Cliff Haynes, Dr. Cynthia Morton, and Roberta Pileggi.

II. <u>INFORMATION ITEM / ADMINISTRATIVE ACTIONS</u>:

11. Graduate Curriculum Committee – April Minutes and May Agenda (Enclosure 10).

12. Update on the Graduate Council election 2024-2027

    The Graduate School has selected Dr. Abdoulaye Kane and Dr. Pilar Useche based on results of the Graduate Faculty election. Those results were sent to the provost's office, and they selected Dr. Rita Men and Dr. Weizhou Zhang as the other two members. Dr. James Jawitz has been appointed by the provost to fill the seat vacated by Dr. Kristin Larsen for 2024-2025.

13. Graduate Programs – Distance or Self-Supporting
    Four MPH concentrations were added as self-supporting concentrations:
    - Biostatistics
    - Epidemiology
    - Environmental Health
    - Population Health Management

14. Graduate Student Success Center
    Dr. Judy Traveis was present to describe the new role Erin Rice will be in and how it has expanded to include international enrollment. She also shared information regarding upcoming graduate student orientations.

III. DISCUSSION ITEMS:

15. Propose extending the 2-term expiration on the final exam to 3-terms.
    The language for the recommended change to the Final Defense and Exam Policy was shared with the group. Discussion was had regarding the benefits of this change, and the revised language will be presented at the next meeting for a vote.

16. #19698 MED - Master of Science (M.S.) with a major in Artificial Intelligence in Biomedical and Health Sciences

17. June Meeting – A June meeting will be held via Zoom. In alignment with the practices of the UCC, the GCC will reserve dates for potential summer meetings.

The meeting adjourned at 1:54 p.m.

Certificate|Close-Modify for request 19058

Info
Request: Modify Graduate Certificate in Curatorial Studies
Description of request: The College of the Arts seeks to modify the number of credit hours required for the graduate certificate in Curatorial Studies
Submitter: Rachel Silveri rsilveri@ufl.edu
Created: 6/12/2024 9:12:26 AM
Form version: 3

Responses
Current Certificate Name

Curatorial Studies

Effective Term
Select the requested term and year that the certificate change(s) will first be implemented. Selecting "Earliest" will allow the change to be effective in the earliest term after full approval.

Earliest Available

Effective Year

Earliest Available

Requested Action

Other (selecting this option will open additional form fields below)

Change Certificate Name?

No

Change Certificate Name on Transcript?

No

Change Credit Hours?

Yes

Current Credit Hours

more than 12 (please detail in description how many credits)

Proposed Credit Hours

12

Change Certificate Description?

No

Change Certificate Prerequisites?

No

Change Certificate Requirements?

Yes

Current Requirements

Requirements for Completion: The Certificate Program in Curatorial Studies utilizes a curriculum structure drawing upon existing coursework consisting of three courses (3 credits each) in the School of Art + Art History and a one 180-hour internship (4 credits). The courses are: Seminar in Curatorial Studies (ARH 6931), Methods of Research and Bibliography (ARH 5816), and an Elective, in addition to the Supervised Internship (ARH 6941). The Certificate is a total of 13 credit hours.

Proposed Requirements

Requirements for Completion: The Certificate Program in Curatorial Studies utilizes a curriculum structure drawing upon existing coursework consisting of three courses (3 credits each) in the School of Art + Art History and a one 135-hour internship (3 credits). The courses are: Seminar in Curatorial Studies (ARH 6931), Methods of Research and Bibliography (ARH 5816), and an Elective, in addition to the Supervised Internship (ARH 6941). The Certificate is a total of 12 credit hours.

The list of electives includes:
ARH 5420 Art in the Age of Revolution
ARH 5667 Colonial Andean Art
ARH 5877 Gender, Representation, and the Visual Arts
ARH 6141 Greek Art Seminar
ARH 6292 Medieval Art Seminar
ARH 6394 Renaissance Art Seminar
ARH 6422 Beginnings of Modernism
ARH 6477 Eighteenth-Century European Art Seminar
ARH 6481 Contemporary Art Seminar
ARH 6496 Modern Art Seminar
ARH 6596 Chinese Art Seminar
ARH 6597 African Art Seminar

ARH 6654 Pre-Columbian Art Seminar
ARH 6666 Colonial Latin American Art Seminar
ARH 6696 American Art Seminar
ARH 6836 Exhibitions Seminar
ARH 6914 Independent Study in Ancient Art History
ARH 6915 Independent Study in Medieval Art History
ARH 6916 Independent Study in Renaissance and Baroque Art History
ARH 6917 Independent Study in Modern Art History
ARH 6918 Independent Study in Non-Western Art History
ARH 6930 Special Topics in Museology
ARH 6938 Seminar in Museum Studies
Or another graduate-level course in art history or a closely related field approved in consultation with the Director of Graduate Studies for Art History

Impact on Program

Modifying the Graduate Certificate in Curatorial Studies from 13 to 12 credit hours will greatly increase the accessibility of the certificate to MA and PhD students.

Rationale for Proposed Change(s)

The proposed change revises the total credit hours of the certificate from 13 to 12 credits and adjusts the credit hours for one particular class ARH 6941 Supervised Internship from 4 to 3 credits. This modification is done to make the certificate more accessible to students. Please note that ARH 6941 is already offered for variable credit, so this only requires a registration change for the students pursuing the certificate rather than an adjustment to the number of credit hours offered for that course.

Our funded MA and PhD students on 9-month assistantships have tuition waivers that cover 9 credits every semester (3 classes at 3 credits each). The original Graduate Certificate in Curatorial Studies proposed 4 credits of Supervised Internship (ARH 6941). This requirement makes it impossible for most of our MA and PhD students to take the Supervised Internship without having to pay for an additional credit hour out of pocket and, as a result, many have avoided obtaining the certificate altogether despite their interest in it. The original Graduate Certificate in Curatorial Studies had no rational for why 4 credit hours of Supervised Internship was preferable to 3 credits. Changing the requirement to 3 credits of Supervised Internship will make the certificate significantly more accessible to our students while still providing them with the same Student Learning Outcomes.

Please note that ARH 6941 is already offered for variable credit, so this only requires a registration change for the students pursuing the certificate rather than an adjustment to the number of credit hours offered for that course.

Assessment Data Review

Describe the Student Learning Outcome and/or program goal data that was reviewed to support the proposed changes.

There will be no changes to the Assessment Data Review.

Academic Assessment Plan Changes

Describe the modifications to the Academic Assessment Plan that result from the proposed change. These changes must be approved by the Academic Assessment Committee. A separate request must be completed for this, which can be found here: https://approval.ufl.edu/start-new-request/modify-aapslo-gradpro/

There will be no changes to the Academic Assessment Plan.

Concentration|New for request 19940

Info
Request: Create a new graduate concentration in Medical Pharmacology and Toxicology for the M.S. degree with a major in Medical Sciences
Description of request: The College of Medicine seeks to create a new concentration in Medical Pharmacology and Toxicology for the Master of Science (M.S.) with a major in Medical Sciences.

This online concentration will be overseen by the departments of Pharmacology & Therapeutics in the College of Medicine and Medicinal Chemistry in the College of Pharmacy.
Submitter: Stephan Jahn scjahn@ufl.edu
Created: 6/12/2024 1:40:13 PM
Form version: 4

Responses
Proposed Action
Choose to add a new concentration if the concentration has never been offered before. In this case documentation of consent from all participating departments must be submitted.
OR,
Choose to participate in an existing concentration if the concentration has already been approved. In this case documentation of consent from all departments offering the major must be submitted.

Create a Concentration

Note that documents can be uploaded on the next page or after the request has been initiated.

Degree Level
Indicate the degree level in which to add the concentration.

M - Master's Degree

Thesis or Non-Thesis
is this concentration for a thesis or non-thesis degree?

Non-Thesis

Concentration Name
Enter the name of the concentration. Example: "Mathematical Modeling" or "Ecological Restoration".

Medical Pharmacology and Toxicology

Credits

Enter the number of credits for the concentration. Note: as a guideline only, graduate concentrations typically range from 9-21 credits (9-12 for master's degrees, or 9-21 for doctoral degrees).

31

Effective Term

Enter the term (semester and year) that the concentration would start.

Fall

Effective Year

2024

Students

Enter the expected number of new students enrolled in this concentration in the first three years.

36

Percentage of Credits Available Fully Online

Indicate the percentage of course credits that will be available through fully online courses.

100%

Percentage of Credits Available Off-Campus

Indicate the percentage of course credits that will be available away from the main Gainesville campus (including courses with onsite & off main campus meetings).

50% or more

Is this an additional (secondary) concentration?

Yes

All Department/Degree/Majors Adding Concentration

List the department / degree / major combinations at the degree level chosen that will offer this concentration.

New MS concentration in Medical Pharmacology and Toxicology College of Medicine,

M.S. degree with a major in Medical Sciences

For example, to request a new "Wetland Sciences" concentration at the master's level, list all master's level degree / major combinations from all participating departments:

- *Forest Resources and Conservation: M.S. in Fisheries and Aquatic Sciences*
- *Forest Resources and Conservation: M.S. in Forest Resources and Conservation*
- *Forest Resources and Conservation: M.F.A.S. in Fisheries and Aquatic Sciences*
- *Forest Resources and Conservation: M.F.R.C. in Forest Resources and Conservation*
- *Geography: M.A in Geography*
- *Geography: M.S. in Geography*
- *Geological Sciences: M.S. in Geology*
- *Geological Sciences: M.S.T. in Geology*

Rationale for Proposed Concentration

Describe the rationale for offering this new concentration and having it on the transcript, how it will enhance the quality of the existing major, how it relates to graduate programs at peer institutions. Also describe what distinguishes this new concentration within the existing major(s) in the degree program, the degree of its overlap with existing majors and concentrations (both in the degree program and in other degree programs at the university), and a justification for any such overlap.

The new concentration in Medical Pharmacology and Toxicology will provide students and working professionals with additional career opportunities after graduation that are not currently addressed by existing programs offered by COM or COP. Given the general need for pharmacology and toxicology knowledge in clinical practice and drug development, the program aims to address a gap that is not covered by either the MS in Medical Physiology & Pharmacology or the MS in Clinical Toxicology. On the national level, several programs are offered in this space, but they appear to be focused on specific aspects of pharmacology and toxicology rather than comprehensively addressing the need for clinical knowledge and laying the foundation for a career in medical and health sciences. Furthermore, no competitor programs are offered jointly by a college of medicine and a college of pharmacy, making this program unique in the expertise that is provided.

While the new concentration shares 50% of its courses with the existing concentration in Medical Physiology and Pharmacology, the change of the remaining 50% from physiology to toxicology dramatically changes the focus and target demographic of the concentration. The existing Medical Physiology and Pharmacology concentration aims to provide students with a well-rounded, albeit fundamental, knowledge of basic physiology, pathophysiology, and the use of drugs to treat that pathophysiology. The vast majority of the students in that concentration are pre-professional (pre- med and pre-PA) students looking for a broadly applicable degree.

The new concentration focuses solely on the effects of different chemical compounds on the human body, with the pharmacology portion addressing the beneficial uses of drugs and the toxicology portion focusing on the adverse effects of these same drugs along with the deleterious effects of other toxins. We believe that the primary demographics of the students who will matriculate into this program are pre-med students who intend to focus on drug treatment and/or toxicology later in their careers, pre-pharmacy students, and researchers working in academia and industry in the fields of drug discovery and development. The collaboration between the Colleges of Medicine and Pharmacy creates a unique offering that does not currently exist within the Master's in Medical Sciences.

Impacts on Other Programs

Describe any potential impact on other programs or departments, including increased need for general education or common prerequisite courses, or increased need for required or elective courses outside of the existing program.

No other programs will be impacted regarding additional prerequisite courses or the need to offer additional electives. All courses that are part of this new program are already offered online by the two departments that contribute to this new concentration.

1 year accelerated curriculum

Semester	Course #	Course	Credit hour	Total credit hours
1	GMS6551	Fundamentals of Medical Pharmacology and Therapeutics	1	9
	PHA6556	Introduction to Clinical Toxicology	3	
	PHA6533	Epidemiology and Biostatistics in Clinical Toxicology	3	
	GMS6520	Medical Pharmacology and Therapeutics I: The Nervous System	2	
2	GMS6530	Medical Pharmacology and Therapeutics II: Cardiovascular, Renal and Respiratory Systems	2	11
	GMS6531	Medical Pharmacology and Therapeutics III: Endocrine, Musculoskeletal and Reproductive Systems	2	
	VME6602	General Toxicology	3	
	GMS6540	Medical Pharmacology and Therapeutics IV: Cancer, Antimicrobial and Antiparasitic Agents	2	
	GMS6504	Advanced Medical Pharmacology	2	
3	GMS6552	Cell Signaling & Therapeutics	2	11
	VME6605	Toxic Substances	3	
	GMS6510	Pharmacology of Cannabis, Tobacco, and Vaping	2	
	PHA6557	Clinical Toxicology 1	3	
	PHA6936	Advanced Topics in Pharmaceutical Sciences (Special Topics)	1	
Total credit hours				**31**

2 year curriculum for working professionals

Semester	Course #	Course	Credit hour	Total credit hours
1	GMS6551	Fundamentals of Medical Pharmacology and Therapeutics	1	4
	PHA6556	Introduction to Clinical Toxicology	3	
2	PHA6533	Epidemiology and Biostatistics in Clinical Toxicology	3	5
	GMS6520	Medical Pharmacology and Therapeutics I: The Nervous System	2	
3	GMS6530	Medical Pharmacology & Therapeutics II: Cardiovascular, Renal and Respiratory Systems	2	7

	GMS6531	Medical Pharmacology and Therapeutics III: Endocrine, Musculoskeletal, and Reproductive Systems	2	
	VME6602	General Toxicology	3	
4	PHA6557	Clinical Toxicology	3	7
	GMS6540	Medical Pharmacology and Therapeutics IV: Cancer, Antimicrobial and Antiparasitic Agents	2	
	GMS6504	Advanced Medical Pharmacology	2	
5	GMS6552	Cell Signaling & Therapeutics	2	5
	VME6605	Toxic Substances	3	
6	GMS6510	Pharmacology of Cannabis, Tobacco, and Vaping	2	3
	PHA6936	Advanced Topics in Pharmaceutical Sciences (Special Topics)	1	
Total credit hours				**31**

All courses are letter-graded.

Concentration | Modify for request 19946

Info

Request: Name change for the M.S. concentration in "Gerontology" to "Innovative Aging Studies"
Description of request: The College of Medicine seeks to modify the admissions requirements and change the name of the graduate concentration in "Gerontology" to "Innovative Aging Studies" for the Master of Science (M.S.) with a major in Medical Sciences.

Submitter: Peter Sayeski psayeski@ufl.edu
Created: 6/6/2024 12:18:13 PM
Form version: 2

Responses

Degree Level

Indicate the degree level in which the concentration is offered.

M - Master's Degree

Thesis or Non-Thesis

Is this concentration for a thesis or non-thesis degree?

Non-Thesis

Concentration

Enter the name of the concentration to be modified.

Gerontology

Effective Term

Enter the term (semester and year) at which the modification should be effective.

Earliest Available

Effective Year

Earliest Available

Is this an undergraduate Innovation Academy Program

No

Department/Degree/Majors to Offer Concentration

List all the department / degree / major combinations at the degree level offering the concentration.

College of Medicine/Master of Science (M.S.)/Medical Sciences

For example, if you are requesting a change to the "Wetland Sciences" concentration at the master's level, you would need to list all master's level degree / major combinations from every participating department:

- *Forest Resources and Conservation: M.S. in Fisheries and Aquatic Sciences*
- *Forest Resources and Conservation: M.S. in Forest Resources and Conservation*
- *Forest Resources and Conservation: M.F.A.S. in Fisheries and Aquatic Sciences*
- *Forest Resources and Conservation: M.F.R.C. in Forest Resources and Conservation*
- *Geography: M.A in Geography*
- *Geography: M.S. in Geography*
- *Geological Sciences: M.S. in Geology*
- *Geological Sciences: M.S.T. in Geology*

Current Curriculum for Concentration

Required Core Courses (24 credit hours)

COURSE NUMBER	COURSE TITLE	CREDIT
GMS 6099	Research Methods in Gerontology	3
GMS 6483	Theories of Aging	3
GMS 6484	Geriatric and Age-Related Diseases	3
GMS 6485	Population-Based Research on Aging	3
GMS 6486	Biology of Aging	3
GMS 6715	Healthy Aging: Behavioral and Clinical Outcomes	3
GMS 6717	Healthy Aging in the New Millennium	3
GMS 6771	Clinical Neuroscience of Aging	3

Elective Courses (6 credit hours). Select 6 credits hours from the course list below.

COURSE NUMBER	COURSE TITLE	CREDITS
GMS 6487	Anti-Aging Interventions	3
GMS 6808	Gerontechnology	3
GMS 6440	Fundamentals of Medical Physiology	1
GMS 6474	Medical Cardiovascular and Muscle Physiology	3
GMS 6419	Medical Endocrinology and Reproduction	3

Proposed Concentration Changes

Describe the proposed changes to the concentration. If requesting a name change please provide details here as well.

Change the name of the graduate concentration for the Master of Science (M.S.) with a major in Medical Sciences, from Gerontology to Innovative Aging Studies.

Also, we wish to drop the admission requirement of two letters of recommendation for this degree.

Pedagical Rationale/Justification

Describe the rationale for the proposed changes to the concentration.

Reason for the name change: Independent market analysis of the degree program has shown that 'Gerontology' is an antiquated word that prohibits enrollments. Our analysis indicated that 'Innovative Aging Studies' is more contemporary and will be more attractive to interested applicants.

Reason for dropping the admissions requirement of two letters of recommendation: We have found these letters are of little value to our admissions process. As such, they are more of a burden to applicants than they are a benefit. That being said, the inclusion of a CV and a Statement of Purpose within the application has been very useful, so we will maintain those admissions requirements.

Impacts on other programs

Describe any potential impact on other programs or departments, including increased need for general education or common prerequisite courses, or increased need for required or elective courses outside of the existing program.

Beyond an increase in enrollments within this specific program, we do not expect there to be meaningful impacts on other programs.

Assessment Data Review

Describe the Student Learning Outcomes and/or program goal data that was reviewed to support the proposed changes.

Our marketing firm (Apollidon) noticed that we are attracting a number of interested applicants to this program. However, in the end, we are losing a disproportionally high number of them to other Aging/Gerontology programs across the country. When we inquired as to why these applicants chose other programs over ours, the most common response was that 'Gerontology' seemed antiquated to them. As such, we are trying to capture a greater percentage of these applicants who are matriculating elsewhere via this proposed name change.

Academic Learning Compact and Academic Assessment Plan

Describe the modifications to the Academic Assessment Plan that result from the proposed change.

The academic assessment plan will not change as a function of either the name change or the dropping of the LOR admissions requirement.

Catalog Copy

Submitter agrees to prepare and upload document showing the catalog copy with the current and proposed curricula edited using the "track changes" feature in Word.

Yes

Concentration|Close for request 19562

Info

Request: Close the graduate concentration in Imaging Science and Technology for the Ph.D. with a major in Mathematics
Description of request: The College of Liberal Arts and Sciences seeks to close the concentration in Imaging Science and Technology for the Doctor of Philosophy (Ph.D.) with a major in Mathematics.
Submitter: Michael Jury mjury@ufl.edu
Created: 5/22/2024 11:18:34 AM
Form version: 3

Responses

Proposed Action

Indicate whether the proposed action is to fully close (terminate) a concentration or to cease participation in a concentration.

Close a Concentration

• *Select to close the concentration if the requesting academic unit is the sole participant in the concentration or if all participating academic units in an inter-disciplinary concentration want to close the concentration. In this latter case, documentation of consent from all participating academic units must be included in the request.*
• *Select to cease participation in a concentration if the requesting academic unit is part of an inter-disciplinary concentration with other academic units and wishes to remove only its portion of the concentration, or if you the requesting academic unit expects the concentration to continue being offered in another degree program.*

Degree Level

Indicate the degree level from which to remove the concentration.

D - Doctoral Degree

Concentration

Enter the name of the concentration to be closed.

Imaging Science and Technology with the major of Mathematics (MAT_PHD02)

Termination Date

Enter the termination date (semester/year), which is the last date students will be accepted into the program.

Fall 2024

Phase-Out Date

Enter the phase-out date (semester/year), which is when the last student in teach-out will have completed the major. This date should allow time for enrolled students to complete the

major in a reasonable amount of time. The phase-out date is the last date that data will be submitted for the major.

Fall 2024

Department/Degree/Majors Closing the Concentration

List the department / degree / major combinations at the degree level chosen at which to close this concentration.

Doctor of Philosophy (Ph.D.) with a major in Mathematics

For example, to request closure of the "Wetland Sciences" concentration at the master's level, list all master's level degree / major combinations from all departments participating in the concentration:

- *Forest Resources and Conservation: M.S. in Fisheries and Aquatic Sciences*
- *Forest Resources and Conservation: M.S. in Forest Resources and Conservation*
- *Forest Resources and Conservation: M.F.A.S. in Fisheries and Aquatic Sciences*
- *Forest Resources and Conservation: M.F.R.C. in Forest Resources and Conservation*
- *Geography: M.A in Geography*
- *Geography: M.S. in Geography*
- *Geological Sciences: M.S. in Geology*
- *Geological Sciences: M.S.T. in Geology*

Rationale for Closure

Describe the rationale for the request to close the concentration.

There are currently no active students or faculty associated with this concentration, and none are anticipated in the future.

Impact on Other Programs

Describe the potential impact that closing the concentration may have on other programs.

none

Steps Taken to Inform Students and Faculty

State what steps have been taken to inform students and faculty of the intent to close the concentration.

department webpages will be updated to reflect the closure

Teach-Out Plan

Explain how students in the major will be able to complete their degree. The teach-out process often extends well beyond the termination date.

There are currently no students actively enrolled in the concentration.

Accommodation of Faculty

Provide an explanation of the manner in which the Department and College intend to accommodate faculty who are currently active in the concentration.

There are currently no faculty solely affiliated with this concentration.

STATE UNIVERSITY SYSTEM OF FLORIDA

State University System of Florida Board of Governors

REQUEST TO OFFER A NEW DEGREE PROGRAM

In accordance with Board of Governors Regulation 8.011

(Please do not revise this proposal format without prior approval from Board staff)

University of Florida

Institution Submitting Proposal

Spring 2025

Proposed Implementation Term

College of Medicine

Name of College(s) or School(s)

IC^3 (The Center is administered through the College of Medicine)

Name of Department(s)/Division(s)

Medical Informatics

Academic Specialty or Field

Master of Science (M.S.) with a major in Artificial Intelligence in Biomedical and Health Sciences

Complete Name of Degree

51.2706

Proposed CIP Code (2020 CIP)

Proposed Program Type

☐ **E&G Program**

☒ **Market Tuition Rate Program**

☐ **Self-Supporting Program**

The submission of this proposal constitutes a commitment by the university that, if the proposal is approved, the necessary financial resources and the criteria for establishing new programs have been met before the program's initiation.

Date Approved by the University Board of Trustees	**President's Signature** **Date**
Board of Trustees Chair's Signature **Date**	**Provost's Signature** **Date**

Projected Enrollments and Program Costs

Provide headcount (HC) and full-time equivalent (FTE) student estimates for Years 1 through 5. HC and FTE estimates should be identical to those in Appendix A – Table 1. Indicate the program costs for the first and the fifth years of implementation as shown in the appropriate columns in Appendix A – Table 3A or 3B. Calculate an Educational and General (E&G) cost per FTE for Years 1 and 5 by dividing the total E&G by FTE.

Implementation Timeframe	HC	FTE	E&G Cost per FTE	E&G Funds	Contract & Grants Funds	Auxiliary/ Philanthropy Funds	Total Cost
Year 1	20	12.5					$588,827.58
Year 2	40	25					
Year 3	60	37.5					
Year 4	80	50					
Year 5	100	62.5					$836,958.80

Programs of Strategic Emphasis Waiver *(for baccalaureate programs only)*

Does the program fall under one of the CIP codes listed below?

☐ **Yes**

☒ **No**

If yes, students in the program will be eligible for the Programs of Strategic Emphasis (PSE) waiver. See Board Regulation 7.008 and the PSE Waiver Guidance for additional details.

CIP CODE	CIP TITLE	CATEGORY
11.0101	Computer and Information Sciences	STEM
11.0103	Information Technology	STEM
14.0801	Civil Engineering	STEM
14.0901	Computer Engineering	STEM
14.1001	Electrical and Electronics Engineering	STEM
27.0101	Mathematics	STEM
40.0801	Physics	STEM
52.0301	Accounting	GAP ANALYSIS
52.0801	Finance	GAP ANALYSIS
52.1201	Management Information Systems	STEM

Additional Required Signatures

I confirm that I have reviewed and approved Need and Demand Section III.F. of this proposal.

Signature of Equal Opportunity Officer

01/16/2024

Date

I confirm that I have reviewed and approved Non-Faculty Resources Section IX.A. and IX.B. of this proposal.

Judith C. Russell — **12/5/2023**

Signature of Library Dean/Director **Date**

Introduction

I. Program Description and Relationship to System-Level Goals

A. Describe within a few paragraphs the proposed program under consideration and its overall purpose, including:

- **degree level(s)**
- **majors, concentrations, tracks, specializations, or areas of emphasis**
- **total number of credit hours**
- **possible career outcomes for each major (provide additional details on meeting workforce need in Section III)**

We offer one major - Artificial Intelligence in Biomedical and Health Sciences. To earn the M.S., students must complete 30 credit hours.

The Artificial Intelligence in Biomedical and Health Science (AIBHS) M.S. program is at the forefront of the intersection of trustworthy artificial intelligence (AI), translational biomedical sciences, and clinical practice. AIBHS students will become highly proficient in developing, validating, and deploying advanced AI technologies in real-world translational biomedical applications and clinical environments. The program will promote vertically integrated AI approaches that produce more meaningful and applicable results that directly benefit patients, the healthcare system, and society.

AIBHS is committed to equipping students with the knowledge, skills, and tools needed to leverage AI's potential in translational biomedical applications and clinical care, including diagnostics, therapeutics, personalized medicine, and healthcare management. Students will learn to design and implement trustworthy AI architectures in diverse domains, such as generative AI, large language models, electronic health records, wearable devices, and medical imaging. Additionally, they will integrate various types of data to advance clinical research and improve clinical decision-making.

AIBHS's interdisciplinary curriculum integrates machine learning fundamentals with biomedical research, medical practice, and clinical workflows. Students will take courses spanning various disciplines, including biomedicine, clinical medicine, bioinformatics, computer science, engineering, applied mathematics, and ethics. Coursework will also include esteemed UF faculty-led rotations in basic biomedical laboratories and clinical rotations in leading UF Health hospitals. Such interdisciplinary training will foster a holistic understanding of AI and its application to basic sciences and clinical sciences, empowering students to leverage AI to advance both.

AIBHS's interdisciplinary program extends beyond technical and biomedical learning. In addition to training in the responsible conduct of research in medicine, AIBHS students will be explicitly instructed in trustworthy AI. Specifically, students will learn about AI's economic, social, legal, and ethical implications and how to navigate potential risks such as biases in datasets, threats to privacy and confidentiality, disparate health outcomes for already marginalized groups, and other dangers to society's well-being. Additional interdisciplinary aspects of AIBHS include dual primary mentorship and signature design studios.

Because cohesive understanding and innovative prowess are best honed through experiential learning, AIBHS offers significant hands-on learning opportunities through its signature design studios. In the AI Design Studios, students are guided by domain experts through the design and application of end-to-end trustworthy ML systems dedicated to resolving real-world medical problems fairly. The Clinical Design Studios offer students direct experience in clinical settings or biomedical research labs through rotations with faculty. Students will experience a variety of contexts, including hospital rotations and basic science laboratories, enabling them to deeply engage with biomedical research and understand the medical system.

AIBHS provides students with a nuanced, integrated understanding of clinical and biomedical research contexts, two domains traditionally treated separately. This non-traditional amalgamation enables AIBHS students to view biomedical advancements and clinical care holistically, thereby positioning them to translate those discoveries into concrete benefits to patient care. The translational power of a cohesive understanding of both basic biomedical research and clinical research, coupled with a deep understanding of how to design, develop, and implement trustworthy AI, ideally positions AIBHS students to translate their research into direct optimizations of equitable healthcare delivery, patient care, and patient outcomes.

Graduates of the Artificial Intelligence in Biomedical and Health Science (AIBHS) M.S. program stand at the intersection of cutting-edge AI technology and personalized healthcare, forging diverse and impactful career paths. Equipped with comprehensive skills in developing and deploying AI technologies in translational biomedical applications and clinical settings, they can pursue roles as AI specialists in healthcare institutions, contributing to the development of diagnostics, therapeutics, and personalized medicine. With expertise in designing trustworthy AI architectures across various domains, such as medical imaging, wearable devices, and electronic health records, graduates are well-suited for roles in research and development, healthcare management, and innovative startups focused on revolutionizing healthcare through AI. Their interdisciplinary training, integrating machine learning, biomedical research, and clinical practice, prepares them for positions spanning academia, industry, and healthcare, driving advancements that directly benefit patients and society. Moreover, their understanding of ethical implications and responsible AI practices positions them as ethical leaders and advocates, essential to navigating challenges related to bias, privacy, and societal well-being in AI-driven healthcare advancements. Ultimately, AIBHS graduates possess a holistic understanding of biomedical research and clinical care, enabling them to transform discoveries into tangible improvements in healthcare delivery and patient outcomes.

B. If the proposed program qualifies as a Program of Strategic Emphasis, as described in the Florida Board of Governors 2025 System Strategic Plan, indicate the category.

- **Critical Workforce**
  - ☐ Education
  - ☒ Health
  - ☐ Gap Analysis
- **Economic Development**
  - ☐ Global Competitiveness
  - ☐ Science, Technology, Engineering, and Math (STEM)

☐ **Does not qualify as a Program of Strategic Emphasis.**

Given the centrality of AI to this program, it is also a STEM program.

II. Strategic Plan Alignment, Projected Benefits, and Institutional Mission and Strength

A. Describe how the proposed program directly or indirectly supports the following:

- **System strategic planning goals (see the link to the 2025 System Strategic Plan on the New Program Proposals & Resources webpage)**
- **the institution's mission**
- **the institution's strategic plan**

Florida's State University System (SUS), the University of Florida (UF), and UF's College of Medicine (COM) are committed to providing unsurpassed teaching, research, and public service. Artificial Intelligence in Biomedical and Health Sciences (AIBHS), a Health program that qualifies as a Program of Strategic Emphasis, will do just that by satisfying many of the 2025 system strategic planning goals.

Teaching and learning

AIBHS will increase the number of degrees awarded in programs of strategic emphasis and provide top-talent students, both in-state and out-of-state, an opportunity to develop sought-after skills here in Florida. It will also strengthen the quality and reputation of COM, UF, and the SUS more generally by being at the forefront of the intersection of AI and clinical health sciences - a nascent domain with exceptional translational promise.

Scholarship, Research, and Innovation

AIBHS scholars, students, and faculty will pioneer an emerging field, ideally positioning them to produce innovative research and scientific breakthroughs, which will directly improve patient care and health outcomes, attract external funding, and promote industry.

Community and Business engagement

Life Sciences and Information Technology are two of Florida's strongest and fastest-growing economic sectors.* Working at the intersection of these, AIBHS scholars will have a nuanced understanding of how to use AI to advance biomedical and clinical sciences. These top-talent graduates will be a boon to Florida's workforce and help industry meet its challenges and to grow. This, in turn, will advance the biological sciences, ultimately benefiting public health.

In addition to advancing UF's strategic mission, AIBHS will also help UF satisfy the objectives of its AI initiative, viz., to be a national leader in artificial intelligence and elevate its impact on research, teaching, and economic development.

*https://www.enterpriseflorida.com/industries/

**https://news.ufl.edu/2020/07/nvidia-partnership/

B. Describe how the proposed program specifically relates to existing institutional strengths. This can include:

- **existing related academic programs**
- **existing programs of strategic emphasis**
- **institutes and centers**
- **other strengths of the institution**

The proposed M.S. program will be housed in IC^3, the Intelligent Clinical Care Center, in UF's College of Medicine's Department of Medicine (DoM), an existing health program of strategic emphasis. AIBHS will be co-located in Gainesville and Jacksonville, allowing students with different learning styles and circumstances to choose the style and location that works best for them.

The AIBHS program will allow collaboration with and strengthen existing academic programs, including Medicine (in Gainesville and Jacksonville), Pharmacology and Therapeutics, Neuroscience, Health Outcomes and Biomedical Informatics (HOBI), and the graduate programs in Computer & Information Science & Engineering (CISE), Biomedical Engineering (BME), and the Electrical & Computer Engineering (ECE). One important difference, however, between HOBI, CISE, BME, and ECE programs and AIBHS, our proposed program, is that the former target a more technical student demographic than our more inclusive AIBHS program, which encourages enrollment of students from non-technical backgrounds as well as non-traditional graduate students, such as those already in the workforce.

AIBHS will also leverage the resources available by the following existing centers and institutions: Intelligent Critical Care Center (IC3), UF Health Jacksonville, McKnight Brain Institute, Center For Spatial Biomolecule Research, UF Diabetes Institute, Molecular Pathology Core, Clinical and Translational Science Institute, Center for Genetic Epidemiology and Bioinformatics, and the UF Scripps Institute for Biomedical Innovation & Technology, amongst others in order to promote synergistic research and innovation.

Another strength at the University of Florida that will make this program a success is HiPerGator, a high-performance computing cluster.

C. Provide the date the pre-proposal was presented to the Council of Academic Vice Presidents Academic Program Coordination (CAVP ACG). Specify any concerns raised and provide a narrative explaining how each concern has been or will be addressed.

The pre-proposal was presented to and approved by the Council of Academic Vice Presidents Academic Program Coordination on September 13, 2023. No concerns were raised.

D. In the table below provide an overview of the institutional planning and approval process leading up to the submission of this proposal to the Board office. Include a chronology of all activities, providing the names and positions of university personnel and external individuals who participated.

- **If the proposed program is at the bachelor's level, provide the date the program was entered into the APPRiSe system, and, if applicable, provide a narrative responding to any comments received through APPRiSe.**
- **If the proposed program is a doctoral-level program, provide the date(s) of the external consultant's review in the planning table. Include the external consultant's report and the institution's responses to the report as Appendix B.**

Planning Process

Date	Participants	Planning Activity Description
Summer 2023	Dr. Azra Bihorac, MD, MS FCCM: Program director, Senior Associate Dean for Research at UF's COM; Professor of Medicine, Surgery, and Anesthesiology; Director, Intelligent Critical Care Center Dr. Benjamin Shickel, PhD: Division of Nephrology, Hypertension & Renal Transplantation, Department of Medicine Dr. Wei Shao, PhD: Division of Nephrology, Hypertension & Renal Transplantation, Department of Medicine Dr. Elizabeth Palmer, PhD: Assistant Director of Research training and Workforce Development, COM, Office of Research Advisory Committee members: Drs. Pinaki Sarder, PhD and Ramon Sun, PhD	Program Development
August 18, 2023	Dean of the College of Medicine, Dr. Colleen Koch	COM Dean supports the M.S./Ph.D program
September 2023	Assistant Provost Dr. Cheryl Gater	The pre-proposal is approved by the Council of Academic Vice Presidents
Fall 2023-Spring 2024	Drs. Azra Bihorac, Benjamin Shickel, Wei Shao, and Elizabeth Palmer	Proposal work. Discussion with Kurt Dudas and others about co-locating the program in Gainesville and Jacksonville
March 2024	Drs. Azra Bihorac, Benjamin Shickel, Wei Shao, and Elizabeth Palmer	Finalizing proposal and submission

E. In the table below, provide a timetable of key events necessary for implementing the proposed program following approval of the program by the Board office or the Board of Governors through to the addition of the program to the State University System Academic Degree Program Inventory.

Events Leading to Implementation

Date	Implementation Activity
Spring 2024	Submit new course requests
Summer 2024	Marketing/advertising strategy
Fall 2024	Implement administrative, marketing, and advertising structure
Spring 2025	Active student recruitment
Summer 2025	Active student recruitment and enrollment
Fall 2025	Welcome inaugural incoming class

Institutional and State-Level Accountability
III. Need and Demand

A. Describe the workforce need for the proposed program. The response should, at a minimum, include the following:

- **current state workforce data as provided by Florida's Department of Economic Opportunity**
- **current national workforce data as provided by the U.S. Department of Labor's Bureau of Labor Statistics**
- **requests for the proposed program from agencies or industries in the university's service area**
- **any specific needs for research and service that the program would fulfill**

National and Florida Workforce Demand

In the table below, provide occupational linkages or jobs graduates will be qualified to perform based on the training provided for the proposed program that does not currently appear in the most recent version of the Search by CIP or SOC Employment Projections Data Tool provided periodically by Board staff.

Occupational Linkages for the Proposed Program

SOC Code (XX-XXXX)	Occupation Title	Source / Reason for Inclusion
27-3042	Technical Writer	AIBHS graduates will have scientific writing experience
15-2051	Data Scientist	Numerous Linkedin job advertisements for data scientists show advanced AI training as a minimum or preferred qualification. AIBHS students will be trained in the design, implementation, and development of cutting-edge AI systems.
11-9111	Medical and Health Services Managers	This position often recruits those with extensive backgrounds in health informatics and clinical experience,* which AIBHS graduates will have
15-1243	Database Architects	LinkedIn shows numerous positions for this category for which AIBHS graduates would qualify.
17-2031	Bioengineers and Biomedical Engineers	This position involves applying knowledge of engineering, biology, and computer science to the design and development of health systems and products. AIBHS students will learn those skills from our AI courses and our studio design.

* https://www.bls.gov/ooh/management/medical-and-health-services-managers.htm#tab-4

Complete the table below and summarize its contents in narrative form. Include data for all linked occupations, including those in the table above. Use data from the Search by CIP or SOC Employment Projections Data Tool provided periodically by Board staff.

Labor Market Demand, CIP Code 51.2706

Occupations	Percent Change in Job Openings		Annual Average Job Openings		Total # of New Jobs		Education Level Needed for Entry
	FL 2022-30	U.S. 2022-32	FL 2022-30	U.S. 2022-32	FL 2022-30	U.S. 2022-32	
Computer and Information Research Scientists 15-1221	23.7	23	144	3,400	322	8,300	Masters/PhD
Computer Occupations, All Other 15-1299	7.6	9.7	1,160	33,500	1046	43,800	Bachelors; FL: Post Secondary
Postsecondary Teachers, All Other 25-1199	11.8	8	2,167	118,000	2,284	108,100	PhD/Masters
Health Information Technologists and Medical Registrars 29-9021*	N/A	16	N/A	3,100	N/A	6,200	Associates

Sources:
Date Retrieved: 12/06/2023
U.S. Bureau of Labor Statistics - https://data.bls.gov/projections/occupationProj
Florida Department of Economic Opportunity - http://www.floridajobs.org/labor-market-information/data-center/statistical-programs/employment-projections
*SOC code 29-9021 is not listed in the Employment Projection Data spreadsheet found at https://www.floridajobs.org/economic-data/employment-projections. I was unable to find reliable Florida employment projection data for this position.

As the data from the Florida Department of Economic Opportunity and the U.S. Bureau of Labor statistics show, myriad jobs are open to those with the qualifications the proposed program will cultivate in its graduates. Because AIBHS graduates will have extensive knowledge of AI, computer modeling, and biomedical environments, they're well equipped to take positions in each of those fields, as well as positions at their intersections.

Furthermore, many of these positions are well-paid, as shown in the table below. The median annual salary in Florida is $61,777 (https://www.census.gov/quickfacts/fact/table/FL/INC110221). Median annual salaries for the positions noted above range from $56,840-$128,950 in Florida, and the average median salary for these positions collectively is $95,070 – well above the state median. Thus, there is good reason to believe that AIBHS graduates will be strong contributors to the state economy.

According to the U.S Department of Labor's Bureau of Labor Statistics and also shown in the table below, **all** professions associated with our proposed program, AIBHS, are growing at faster than average rates, especially here in Florida. Although the table above shows that a bachelor's degree is formally required for an entry level position in some of the relevant fields, an advanced degree, such as an M.S., is required in practice and *significantly* increases one's competitiveness and earning potential. This is especially the case for positions in fields that have higher median salaries, such as Data Science, Computer and Information Research Science, Biomedical Engineering, and Medical and Health Service management.

Job Opportunities for AIBHS Graduates*

SOC	Occupation	Median FL Salary	Projected FL growth 2022-30	Median National salary	Projected National growth 2021-31
15-1221	Computer and Information Research Scientists	114,590[1]	23.7%[2]	136,620[3]	23% (much faster than average)[3]
15-1299	Computer Occupations, All Other	88,150[1]	7.6%[2] 15%[4]	98,740[5]	10% (faster than average)[5]
15-2051	Data Scientists	100,520[1]	31.4%[2]	103,500[6]	35% (much faster than average growth)[6]
29-9021	Health Information Technologists and Medical Registrars	56,840[1]	N/A	58,250[7]	16% (much faster than average)[7]
27-3042	Technical Writer	76,250[1]	15%[2]	79,960[8]	7% (faster than average)[8]
11-9111	Medical and Health Services Managers	101,700[1]	N/A	104,830[9]	28% (much faster than average)[9]
15-1243	Database Architects	128,950[1]	9.4%[2]	112,120[10]	8% (faster than average)[10]
17-2031	Bioengineers and Biomedical Engineers	93,560[1]	13.1%[2]	99,550[11]	5% (faster than average)[11]

*Please see Appendix K for sources

Agency and industry calls

In addition to the data from Florida's Department of Economic Opportunity and the U.S. Bureau of Labor Statistics showing the demand for skills that graduates of the proposed AIBHS will have, agencies and industry are also calling for the same. For instance, in 2020, the Centers for Medicare and Medicaid Services held a competition with specific challenges to develop machine learning and deep learning

tools for the clinic. Also in 2020, the NSF, in partnership with the NIH, launched Smart Health and Biomedical Research in the Era of Artificial Intelligence and Advanced Data Science (SCH), a program granting 10-16 awards per year of $1.2 million dollars to successful PIs proposing high risk, high reward research developing novel intelligent methods to "collect, sense, connect, analyze and interpret data from individuals, devices and systems to enable discovery and optimize health" (https://www.nsf.gov/pubs/2021/nsf21530/nsf21530.htm). In 2022, the NIH launched a new Common Fund program called Bridge2AI to expand the use of AI in biomedical and behavioral research, investing $130M over 4 years.

Specific Needs for Research and Service

There are gaps in the healthcare industry where AI could be integrated to improve diagnostics, therapeutics, personalized medicine, healthcare management, and clinical decision-making. The program aims to fulfill the need for professionals capable of bridging these gaps and developing innovative solutions.

B. Provide and describe data that support student demand for the proposed program. Include questions asked, results, and other communications with prospective students.

The rapid growth of AI has accelerated discoveries across diverse scientific fields* and permeated almost every type of work environment. It is projected that 40% of the global workforce will have to be upskilled in the next three years.** The biomedical, behavioral, and clinical sciences are prime for AI integration in every aspect of research and practice. Yet widespread integration of AI remains halted by, among other factors, an insufficiently skilled workforce for domain-specific AI applications in research. Many domain experts lack the foundational understanding of AI systems and methodologies, and opportunities for rapid AI training for research are limited. The two strategic NIH Common Fund Programs, AIM Ahead and Bridge2AI, recognize an unmet need for innovative approaches for research training in AI to address the critical need for an AI-ready research workforce for biomedical, behavioral, and clinical sciences.

Furthermore, the demand for expanded AI education and hands-on experience among UF medical students is high, and current training gaps would be adequately addressed by the AIBHS degree program. This demand is evidenced by extracurricular activities involving AI that have formed in response to the lack of suitable AI education, including the student-run "AI Interest Group," the newly formed "AI in Medicine" track of the Discovery Pathways Program, the high volume of Medical Student Research Program (MSRP) students who match to AI-based mentors, and the popularity of numerous in-person AI training workshops at the UF College of Medicine.

* Chaudhuri K, Varma A, Malik A, editors. Artificial Intelligence as an antidote for managing people in organizations: How realistic. British Academy of Management Conference; 2020.
Chen X, Zou D, Xie H, Cheng G, Liu C. Two decades of artificial intelligence in education. Educational Technology & Society. 2022;25(1):28-47.
Miller T. Explanation in artificial intelligence: Insights from the social sciences. Artificial intelligence. 2019;267:1-38.
Xu Y, Liu X, Cao X, Huang C, Liu E, Qian S, Liu X, Wu Y, Dong F, Qiu C-W. Artificial intelligence: A powerful paradigm for scientific research. The Innovation. 2021;2(4).
Zhao X. AI in Civil Engineering. AI in Civil Engineering. 2022;1(1):1.
** Hancock B, Lazaroff-Puck K, Rutherford S. Getting practical about the future of work. McKinsey Quarterly. 2020;1:65-73.

C. Complete Appendix A – Table 1 (1-A for undergraduate and 1-B for graduate) with projected student headcount (HC) and full-time equivalents (FTE).

- **Undergraduate FTE must be calculated based on 30 credit hours per year**
- **Graduate FTE must be calculated based on 24 credit hours per year**

In the space below, explain the enrollment projections. If students within the institution are expected to change academic programs to enroll in the proposed program, describe the anticipated enrollment shifts and impact on enrollment in other programs.

We expect to attract professionals working in biomedical fields in and out of the state of Florida as well as students with B.S. degrees, including those simultaneously pursuing other degrees, especially medical professional degrees. We do not anticipate any students transferring from other graduate programs at UF. Enrollment in the 1 ½ year M.S. program is expected to start at 20 students in Year 1 and to increase to 100 students in Year 5. Because AI programs are in high demand, and we will offer hybrid courses (synchronous online and face-to-face) in Gainesville and Jacksonville, a major metropolitan area, we believe that our enrollment projections are reasonable. For a market analysis, see Appendix M.

D. Describe the anticipated benefits of the proposed program to the university, local community, and the state. The benefits of the program should be described both quantitatively and qualitatively.

Benefits to the University:
AIBHS' explicit focus on ensuring that its students are well-positioned to advance translational biomedical research and practice, as well as its focus on AI, will benefit the university tremendously.

UF is already committed to translational medicine. This program furthers that commitment by leveraging the power of AI, which distinguishes it from other programs. Students will learn to design, develop, and implement trustworthy cutting-edge AI architecture, exponentially accelerating translational research and directly improving health management, processes, and delivery, as well as patient outcomes. Students concurrently pursuing an advanced medical degree alongside the AIBHS M.S. will be able to utilize their AIBHS training in practice to improve care and outcomes for patients directly.

Such a technologically cutting-edge program that promises to directly improve people's well-being will attract high-caliber students from both the state and the nation to the university. Not only will traditional high-quality graduate students be attracted to the program, but students pursuing advanced medical degrees, such as the M.D., will be attracted to UF by the possibility of earning an AIBHS M.S. degree to complement their medical training.

AIBHS will also foster collaborations between departments and colleges, promoting innovative research at the intersections of translational biomedical science, clinical science, computer science, and engineering.

Ultimately, AIBHS will advance UF's AI initiative and further enhance UF's reputation as an institution dedicated to improving the lives of Floridians.

Benefits to the local community:
This program will yield concrete health benefits for the local community. AIBHS will equip students with the knowledge, skills, and tools needed to leverage AI's potential in translational biomedical applications

and clinical care, including diagnostics, therapeutics, personalized medicine, and healthcare management. Students will learn to design and implement various trustworthy AI architectures in domains such as generative AI, large language models, electronic health records, wearable devices, and medical imaging, as well as to integrate various types of data in order to advance research and to improve clinical decision-making. As a result, AIBHS graduates will be uniquely positioned to rapidly accelerate translational biomedical research, precision medicine, health management, processes, and delivery, as well as to improve patient care.

Moreover, AIBHS will benefit local businesses. There are numerous biotech companies located in Alachua County, Florida, including, among others, RTI Surgical and Resilience. On a randomly selected day, 10/27/2023, both had job openings available for those with graduate training of the sort AIBHS will provide, with salaries ranging from $115,000-$173,000. Similarly, on 3/6/2024, a random search through LinkedIn for 'AI' jobs in Jacksonville produced over 20 pages of opportunities. Of the 5 pages I looked through, I found 13 positions AIBHS students would be well qualified for, with salaries ranging from $80,000-$188,000. Among others, open positions include a directorship for the American Cancer Society's National Health Tech AI Initiative and a directorship for eClinical Solutions' Product Management AI/ML Initiative. This suggests that Alachua County, as well as Jacksonville, would benefit from a program that produces experts in the design, implementation, and use of AI to advance biomedical research and improve clinical practice.

Benefits to the state of Florida:
In addition to concrete improvements to the healthcare system and patient care as well as the workforce contributions AIBHS would make through its production of highly skilled graduates in demanding and rapidly growing fields, [see table Job Opportunities for AIBHS Graduates in section III. As mentioned above], AIBHS holds the potential to generate new startup ventures that would create jobs.

Moreover, a UF survey showed that 42% of UF undergraduates pursue graduate school. Among them, most pursue advanced degrees in "Health Professions and Related Clinical Sciences," followed by Engineering, Business Management, and Biological and Biomedical Sciences. Of these students, 65% attend graduate school in Florida. We want to increase this rate by offering additional incentives for these students to continue studying, living, and practicing their professions in Florida. We achieve this goal by offering a rigorous program in a field they are already drawn to (https://career.ufl.edu/gain-experience/student-outcomes/).

E. If other public or private institutions in Florida have similar programs at the four- or six-digit CIP Code or in other CIP Codes where 60 percent of the coursework is comparable, identify the institution(s) and geographic location(s). Summarize the outcome(s) of communication with appropriate personnel (e.g., department chairs, program coordinators, deans) at those institutions regarding the potential impact on their enrollment and opportunities for possible collaboration in the areas of instruction and research.

Programs in the SUS with CIP code 51.2706 substantially differ from the one proposed here. There are three: FIU's M.S. in Health Informatics and Analytics, UNF's M.S. in Health Informatics, and USF's M.S. in Health Informatics. First, these programs are primarily online: FIU's and USF's programs are entirely online, and UNF's is primarily online. Although AIBHS will have an online component, we will also offer both synchronized hybrid and face-to-face courses. Second, these programs do not include robust AI training as part of their curriculum, while AIBHS is an AI program involving in-depth training in AI and its applications to translational biomedical research and clinical contexts. Third, and relatedly, FIU's, UNF's, and USF's programs are geared more towards training students in healthcare informatics for healthcare

management (indeed, FIU's is offered through its business school). AIBHS graduates will receive training in healthcare management, delivery, and processes, but the focus of the program is to enable students to use all tools at their disposal, especially AI architectures, to improve such workflows, to advance translational biomedical research, and to have a direct beneficial impact on clinical practice.

The proposed AIBHS is the first of its kind in the state of Florida. First, AIBHS is an **applied AI program** in the clinical and biomedical sciences. As such, its curriculum integrates training in AI design, development, and implementation into *each* of its courses. Second, AIBHS is an **interdisciplinary** program that integrates coursework spanning a variety of disciplines, including biomedicine, clinical medicine, bioinformatics, computer science, engineering, and applied mathematics, as well as explicit training in the social, economic, legal, and ethical implications of AI. Students will also have dual mentors: a technical AI expert and a clinical expert. Third, AIBHS makes **experiential learning** a central part of its curriculum. Each semester, students will take courses where they practice developing and testing various AI tools while being immersed in biomedical or clinical environments, ensuring that they have both the theoretical knowledge and the practical skills needed to effectively implement AI in real-world biomedical and clinical contexts.

F. If the proposed program substantially duplicates a program at Florida Agricultural and Mechanical University (FAMU), a letter of support from FAMU must be provided. The letter must address whether the proposed program may adversely affect FAMU's ability to achieve or maintain student diversity in its existing program. The institution's Equal Opportunity Officer shall review this section of the proposal, sign, and date the additional signature page to indicate that all requirements of this section have been completed.

Not Applicable: FAMU doesn't have a comparable program.

IV. Curriculum

A. Describe all admission standards and all graduation requirements for the program. Hyperlinks to institutional websites may be used to supplement the information provided in this subsection; however, these links may not serve as a standalone response. For graduation requirements, describe any additional requirements that do not appear in the program of study (e.g., milestones, academic engagement, publication requirements).

The graduate program in AIBHS aims to train professionals in leveraging trustworthy AI techniques for innovative solutions for biomedical research, healthcare analytics, and precision medicine. The AIBHS program seeks to enroll students who demonstrate a blend of academic excellence, leadership capabilities, and unwavering determination. It welcomes candidates with diverse backgrounds, including medical students and students in fields like biological or medical sciences, biostatistics, bioinformatics, biomedical engineering, and computer science. Ideal applicants include students pursuing professional medical degrees such as an M.D., those with undergraduate degrees in biology, chemistry, microbiology, biostatistics, or engineering, or those with strong computing skills. Additionally, students working toward a Ph.D. in areas such as cell biology, neuroscience, and biostatistics may also find that this program aligns well with their academic and professional goals, offering a unique opportunity to receive concrete clinical AI training capable of accelerating research and improving clinical processes and outcomes.

Admission Standards

To be admitted into the M.S. in AIBHS, candidates must graduate from an accredited baccalaureate program with either a B.S. in a relevant discipline or demonstrate academic and research excellence through work in multidisciplinary courses. While not mandatory, a strong background in either biomedical sciences, preferably with clinical experience, or computing, evidenced by proficiency in modern programming languages such as Python or R, is highly desirable. In addition to these criteria, all applicants must meet the following requirements:

GPA: Minimum of 3.0
GRE: Waived

Admission criteria into the AIBHS M.S. program following enrollment in or completion of a professional medical degree, such as an M.D. or an M.S. in another discipline, remain the same as for students entering the program with a baccalaureate degree.

International applicants are exempt from the English proficiency requirement after completing one academic year at a recognized, regionally accredited university or college in a country where English is the official language. Students will have to meet all requirements of the University of Florida Graduate School Admissions and the following requirements:

TOEFL: 550 on paper-based; (213 on computer-based; 80 on Internet-based)
TOEFL may be substituted with IELTS: 6 or MELAB: 77

Transfer of credits from another institution or program to count towards the AIBHS the MS degree is only accepted "under case-by-case circumstances and assessments" through a formal petition process. Acceptance of credit transfer requires the approval of the AIBHS committee and the Dean of the Graduate School. Furthermore, this process will be subject to the limits and conditions set forth by the UF Graduate School and the College of Medicine. Petitions for transfer of credit should be made during the student's first term of enrollment in the AIBHS program. Only graduate-level (5000-7999) work earned with a grade of A, A-, B+, or B is eligible for transfer of credit. In accordance with UF's Graduate School policy, no more than 15 transfer credits towards the M.S. are allowed, and "[t]hese can include no more than 9 credits from institution/s approved by UF, with the balance obtained from postbaccalaureate work at the University of Florida." (https://gradcatalog.ufl.edu/graduate/degrees/).

Graduation Requirements

The appropriate grade point requirements for graduation are:

1. A minimum grade of 3.00 (B or higher) in each core course
2. An overall GPA of 3.00 or higher across all elective courses

Successful completion of the M.S. requires that a student either successfully completes an oral final examination, a capstone project, or a Master's thesis, which includes a successful defense.

Final Oral Examination:

Students pursuing the final oral examination option for completing the M.S. are expected to take and pass the exam in the semester at the end of which they plan to graduate. The pass/fail oral examination is comprehensive and will be administered by 2-3 faculty members of IC^3, who will be selected by the graduate committee.

Capstone Project:

The capstone project will be designed in consultation with the student's supervisory chair and will demonstrate mastery of an agreed-upon topic in the area.

Proposal: Students will be required to develop and submit a proposal for their capstone research project. This should outline the project's objectives, methodology, expected outcomes, and timeline.

Conducting the Research: Over the course of the project, students are expected to rigorously conduct the research outlined in their proposal, which includes collecting and analyzing clinical data, developing and refining AI models, and carefully interpreting and validating results.

Final Report: Upon completion of the research, students must prepare a comprehensive written report; discussing the research question, methods used, results obtained, and the significance of the findings may be required to defend their project in an oral examination.

Master's Thesis:
Students pursuing the thesis option must initiate a supervisory committee of faculty members, which must be established by the end of year 1 Spring semester. "The supervisory committee for a master's degree with a thesis should consist of at least three Graduate Faculty members unless otherwise specified. Each master's thesis candidate must prepare and present a thesis that shows independent investigation. It must be acceptable, in form and content, to the supervisory committee and to the Graduate School. The work must be of publishable quality and must be in a form suitable for publication, guided by the Graduate School's format requirements." For more on graduate school requirements, see https://gradcatalog.ufl.edu/graduate/degrees/.

B. Describe the specific expected student learning outcomes associated with the proposed program and include strategies for assessing the proposed program's learning outcomes. If the proposed program is a baccalaureate degree, include a hyperlink to the published Academic Learning Compact and the document itself as Appendix C.

Expected student learning outcomes associated with the Artificial Intelligence in Biomedical and Health Sciences (AIBHS) and strategies for assessing them are listed below.

Learning Outcomes

1. Technical Proficiency in AI: Demonstrate proficiency in designing, implementing, and validating state-of-the-art AI technologies for biomedical applications. This outcome will be assessed through coursework assignments, projects, and evaluations in core AI courses.
2. Integration of AI with Biomedical Research: Integrate AI methodologies with biomedical research and clinical practices. This outcome will be assessed through evaluations of experiential learning courses and rotations in labs and assessments of the application of AI methodologies in solving real-world medical problems.
3. Interdisciplinary Understanding: Display a holistic understanding of AI's applications in biomedical and clinical sciences. This outcome will be assessed through evaluations of interdisciplinary coursework and projects that combine biomedicine, AI, ethics, and instruments measuring the depth of understanding through case studies or comprehensive exams.
4. Ethical and Responsible AI Implementation: Demonstrate awareness of ethical, legal, and societal implications of AI in healthcare. This outcome will be assessed through evaluations of coursework on ethical implications and the student's ability to identify and address ethical challenges in AI implementation.
5. Clinical Exposure and Application of AI: Apply AI in clinical settings effectively. This outcome will be assessed by course performance in Clinical AI Design studios and rotations in clinical labs and healthcare settings, including the evaluations of the impact of AI solutions on patient care through case studies or reports.
6. Dual Primary Mentorship Understanding: Benefit from dual mentorship in both clinical and technical domains. This outcome will be assessed by gathering feedback from mentors and students about the effectiveness of the dual mentorship model in guiding research and overall learning.

Cross-cutting assessment strategies:

1. Project-based Assessments: Evaluate student projects in AI Design Studios and Clinical AI Design Studios for innovation, application, and impact.
2. Exams and Assignments: Assess understanding of AI fundamentals, ethical implications, and biomedical applications through exams and assignments in core and elective courses.
3. Mentor Feedback: Obtain feedback from mentors regarding students' progress, adaptability, and interdisciplinary learning.
4. Peer and Self-Evaluations: Encourage self-assessment and peer reviews of project work, fostering critical evaluation skills and teamwork.

We will align these assessment strategies with the program's learning objectives and provide a comprehensive evaluation of students' knowledge, skills, and application abilities within the AI and biomedical intersection. We will regularly review and refine assessment strategies to ensure the program's continuous improvement and alignment with evolving needs.

C. If the proposed program is an AS-to-BS capstone, provide evidence that it adheres to the guidelines approved by the Articulation Coordinating Committee for such programs, as outlined in State Board of Education Rule 6A-10.024. Additionally, list any prerequisites and identify the specific AS degrees that may transfer into the proposed program.

☒ Not applicable to this program because it is not an AS-to-BS Capstone.

D. Describe the curricular framework for the proposed program, including the following information where applicable:

- **total number of semester credit hours for the degree**
- **number of credit hours for each course**
- **required courses, restricted electives, and unrestricted electives**
- **a sequenced course of study for all majors, concentrations, tracks, or areas of emphasis**

The proposed AIBHS M.S. is a 30-credit-hour program consisting of a set of four core courses (11 credit hours), four experiential learning courses (10 credit hours), and 3 electives (9 credit hours). All courses are letter graded, and the courses listed below will be administered through the Intelligent Clinical Care Center, IC^3, home of the AIBHS program. To complete the program, a student must also pass a final oral examination, submit a passing capstone project, or submit and successfully defend a master's thesis.

The 4 required core courses (11 credits) are:

- CAI 5XXX Fundamentals of AI in Medicine I (3 credits) [course request 19996]
- CAI 5XXX Fundamentals of AI in Medicine II (3 credits) [course request 19997]
- CAI 5XXX Biostatistics for AI (2 credits) [course request 20019]
- CAI 5XXX Economic, Social, Legal and Ethical Implications of AI in Medicine (3 credits) [course request 19995]

The 4 required experiential learning courses (10 credits) are:

- CAI 5XXX AI Design Studio I (1 credit) [course request 19998]
- CAI 5XXX AI Design Studio II (3 credits) [course request 19999]

- CAI 6XXX Clinical AI Design Studio I (3 credits) [course request 20000]
- CAI 6XXX Clinical AI Design Studio II (3 credits) [course request 20017]

Students must also earn 9 credit hours total in electives.
Of the 4 electives (12 credits) listed below, students must take 6 credit hours:

- CAI 5XXX AI in Medical Image Analysis (3 credits) [course request 20018]
- CAI 6XXX Applied Generative AI in Medicine (3 credits) [course request 20023]
- CAI 5XXX AI for Clinical Decision Support (3 credits) [course request 20020]
- CAI 5XXX AI-Powered Drug Discovery (3 credits) [course request 20022]

Students may choose to earn the remaining three elective credit hours by taking:

- CAI 6XXX Supervised Research in AI for Health (1-6 credits) [course request 20021]

Students interested in conducting independent research may take this course. However, only three credits of CAI 6XXX Supervised Research in AI for Health can apply toward the 30 credits required for the M.S. degree.

Course Sequence

Full-time student course sequence sample [Exam Option]

Fall Year 1 [9 credits]	Spring Year 1 [9 credits]	Summer Year 1 [3 credits]
• CAI 5XXX Fundamentals of AI in Medicine I (3) • CAI 5XXX AI Design Studio I (1) • CAI 5XXX Biostatistics for AI in Medicine (2) • Elective (3) – e.g., CAI 5XXX AI in Medical Image Analysis	• CAI 5XXX Fundamentals of AI in Medicine II (3) • CAI 5XXX AI Design Studio II (3) • Elective (3) – e.g. CAI 6XXX Applied Generative AI in Medicine	• CAI 6XXX Clinical AI Design Studio I (3)

Fall Year 2 [9 credits]	Spring Year 2	Summer Year 2
• CAI 6XXX Clinical AI Design Studio II (3) • CAI 5XXX Economic, Social, Legal and Ethical Implications of AI in Medicine (3) • Elective (3) – CAI 5XXX AI for Clinical Decision Support (3) **Graduation**		

Full-time student course sequence sample [Thesis/Capstone project option]

Fall Year 1 [9 credits]	Spring Year 1 [9 credits]	Summer Year 1 [3 credits]
• CAI 5XXX Fundamentals of AI in Medicine I (3) • CAI 5XXX AI Design Studio I (1) • CAI 5XXX Biostatistics for AI in Medicine (2) • Elective (3) – e.g., CAI 5XXX AI in Medical Image Analysis	• CAI 5XXX Fundamentals of AI in Medicine II (3) • CAI 5XXX AI Design Studio II (3) • Elective (3) – e.g., CAI 6XXX Applied Generative AI in Medicine	• CAI 6XXX Clinical AI Design Studio I (3)

Fall Year 2 [9 credits]	Spring Year 2	Summer Year 2
• CAI 6XXX Clinical AI Design Studio II (3) • CAI 5XXX Economic, Social, Legal and Ethical Implications of AI in Medicine (3) • Elective (3) – CAI 5XXX Supervised Research in AI for Health (3) **Thesis/Capstone Project Graduation**		

Part-time student course sequence sample [Exam option]

Fall Year 1 [4 credits]	Spring Year 1 [6 credits]	Summer Year 1 [3 credits]
• CAI 5XXX Fundamentals of AI in Medicine I (3) • CAI 5XXX AI Design Studio I (1) • CAI 5XXX Biostatistics for AI (2)	• CAI 5XXX Fundamentals of AI in Medicine II (3) • CAI 5XXX AI Design Studio II (3)	• CAI 6XXX Clinical AI Design Studio I (3)

Fall Year 2 [6 credits]	Spring Year 2 [3 credits]	Summer Year 2
• CAI 6XXX Clinical AI Design Studio II (3) • CAI 5XXX Economic, Social, Legal and Ethical Implications of AI in Medicine (3)	• Elective (3) – e.g. CAI 6XXX Applied Generative AI in Medicine (3)	

Fall Year 3 [5 credits]	Spring Year 3 [3 credits]	Summer Year 3
• Elective (3) – e.g. CAI 5XXX AI in Medical Image Analysis (3)	• Elective (3) – e.g., CAI 5XXX AI-Powered Drug Discovery (3) **Graduation**	

Part-time student course sequence sample [Thesis/Capstone project option]

Fall Year 1 [4 credits]	Spring Year 1 [6 credits]	Summer Year 1 [3 credits]
• CAI 5XXX Fundamentals of AI in Medicine I (3) • CAI 5XXX AI Design Studio I (1) • CAI 5XXX Biostatistics for AI (2)	• CAI 5XXX Fundamentals of AI in Medicine II (3) • CAI 5XXX AI Design Studio II (3)	• CAI 6XXX Clinical AI Design Studio I (3)

Fall Year 2 [6 credits]	Spring Year 2 [3 credits]	Summer Year 2
• CAI 5XXX Clinical AI Design Studio II (3) • CAI 5XXX Economic, Social, Legal and Ethical Implications of AI in Medicine (3)	• Elective (3) – e.g. CAI 6XXX Applied Generative AI in Medicine (3)	

Fall Year 3 [5 credits]	Spring Year 3 [6 credits]	Summer Year 3
• Elective (3) – e.g. CAI 5XXX AI in Medical Image Analysis (3) • Elective (3) – e.g., CAI 5XXX AI Powered Drug Discovery (3)	• Elective (3) – e.g. CAI 6XXX Supervised Research in AI for Health (3) **Thesis/Capstone project** **Graduation**	

E. Provide a brief description for each course in the proposed curriculum.

Core Course Descriptions

• **CAI 5XXX Fundamentals of AI in Medicine I** (3 credits)
This course introduces the fundamental concepts of Artificial Intelligence and Machine Learning (AI/ML) with a focus on applications in the medical field. It covers foundational AI/ML concepts, diverse medical data sources, and the complete lifecycle of AI/ML in healthcare, complemented by insights into model

evaluation and ethical considerations. The course offers a mix of lectures, hands-on labs, and project work, emphasizing practical application in real-world scenarios.
* https://secure.aa.ufl.edu/Approval/reports/19996

• **CAI 5XXX Fundamentals of AI in Medicine II** (3 credits)
Building on the foundational concepts introduced in Fundamentals of Artificial Intelligence in Medicine I, this course explores deeper into Artificial Intelligence (AI), with a specific focus on deep learning and its applications in the field of medicine. Students will learn more advanced deep learning architectures, including convolutional neural networks (CNNs), recurrent neural networks (RNNs), and transformers. The curriculum emphasizes practical applications, using these technologies to analyze medical imaging, interpret clinical notes, and mine electronic health records.
*https://secure.aa.ufl.edu/Approval/reports/19997

• **CAI 5XXX Biostatistics for AI in Medicine** (2 credits)
This course highlights the crucial role of biostatistics in AI-driven medical applications. Students will master foundational biostatistical methods, design effective medical experiments, and navigate the intricacies of large biomedical datasets. Emphasizing the union of traditional biostatistics with contemporary AI techniques, the course ensures proficiency in data analysis, AI model validation, and addressing ethical challenges in medical data use. Through lectures, labs, and case studies, participants will be adept at bridging the gap between AI, medicine, and biostatistical principles.
*https://secure.aa.ufl.edu/Approval/reports/20019

• **CAI 5XXX Economic, Social, Legal, and Ethical Implications of AI in Medicine** (3 credits)
This course provides an in-depth exploration of the intersection between Artificial Intelligence (AI) and society, with a focus on alignment, ethics, economic implications, and legal policy. Students will analyze the ethical dilemmas arising from AI technologies, including biases, fairness, transparency, accountability, and privacy; analyze potential economic disruptions and identify strategies for inclusive growth and equitable distribution of AI-generated benefits; examine existing and emerging legal and regulatory frameworks governing AI technologies, including data protection, intellectual property, liability, and accountability; and study policy approaches and initiatives at the national and international levels aimed at fostering responsible AI development and deployment.
*https://secure.aa.ufl.edu/Approval/reports/19995

Experiential Learning Course Descriptions

• **CAI 5XXX AI Design Studio I** (1 credit)
This experiential seminar course will feature numerous faculty experts from diverse backgrounds who will guide students through more than a dozen unique real-world examples of machine learning for healthcare applications. Students will gain valuable experience in designing, developing, and deploying AI systems using contemporary tools, models, and platforms. Through a series of interactive and open-ended vignettes, rotating panels of AI and physician-scientists will guide students through the design and application of end-to-end ML systems. Faculty on the cutting-edge of medical AI research will foster an environment of innovation, creativity, and nonlinear thinking via project-based experiential learning.
*https://secure.aa.ufl.edu/Approval/reports/19998

• **CAI 5XXX AI Design Studio II** (3 credits)
AI Design Studio II is an experiential applied research course in which each student will propose a self-directed clinical AI research project that addresses a real-world healthcare challenge and spend the full semester building and testing their AI system. Students will be supervised by an AI faculty member as they organize, develop, evaluate, and refine their approach. This course follows the guided experiential learning and high-level overview of the clinical AI landscape presented in AI Design Studio I. Students will be paired with a technical AI faculty member whose research aligns with the student's proposed

project. AI Design Studio II is focused on refining technical methods on retrospective datasets and will prepare students for prospective and immersive aspects of Clinical AI Design Studio I rotations.
*https://secure.aa.ufl.edu/Approval/reports/19999

• **CAI 6XXX Clinical AI Design Studio I** (3 credits)
Clinical AI Design Studio I offers an immersive learning experience for students interested in the intersection of artificial intelligence (AI) and clinical practice. Throughout the semester, students will participate in rotations, spending time working in various faculty members' labs or clinical domains. These rotations provide a unique opportunity to delve into various research domains and acquire valuable insights into ongoing clinical AI initiatives. Additionally, they provide hands-on experience and real-world exposure, informing and inspiring the implementation of AI innovations within clinical settings. Students will not only observe but may actively contribute to the work happening in these labs, acquiring practical skills related to AI development, data analysis, and clinical problem-solving. The course emphasizes understanding the clinical context, allowing students to apply AI technologies to real-world healthcare challenges. At the end of the course, students will decide who they want as their clinical advisor, informed by their experiences during rotations and their alignment with specific research interests. They will join the selected clinical advisor for **Clinical AI Design Studio II** for a more in-depth experience.
*https://secure.aa.ufl.edu/Approval/reports/20000

• **CAI 6XXX Clinical AI Design Studio II** (3 credits)
Students will embark on an immersive journey into the world of clinical artificial intelligence with Clinical AI Design Studio II. This course offers a unique, extended engagement with a faculty advisor, building upon the foundational experiences from Clinical AI Design Studio I. Students will delve into the specialized clinical domain of their advisor, gaining firsthand insights into the intricacies of patient care and medical decision-making processes. Throughout the term, students will integrate into their advisor's research lab, contributing to a significant research project. This hands-on experience is designed to enhance students' understanding of the clinical application of AI technologies. They will acquire and refine critical skills in project conceptualization, robust study design, effective study execution, and the strategic deployment of AI models within a real-world clinical setting. The course structure is tailored to foster a collaborative learning environment, with a blend of mentor-guided research, interdisciplinary teamwork, and independent study. Students will participate in regular lab meetings, engage in critical discussions on current AI research, and receive personalized mentorship to guide their project development.
*https://secure.aa.ufl.edu/Approval/reports/20017

Elective Course Descriptions

• **CAI 5XXX AI in Medical Image Analysis** (3 credits)
Medical imaging refers to technologies that visualize the interior of the human body. Over the last decades, medical imaging has become an increasingly important tool for the early diagnosis, prognosis, and treatment of various diseases. This course will focus on recent advances in artificial intelligence for medical image analysis. Topics covered in this course include (1) Basics of medical imaging, (2) Image visualization, (3) Convolutional neural networks, (4) Image classification, (5) Image segmentation, (6) Transformer networks, (7) Image registration, (8) Generative adversarial networks, (9) Image-to-image translation, (10) Image super-resolution, (11) Diffusion Models.
*https://secure.aa.ufl.edu/Approval/reports/20018

• **CAI 5XXX Applied Generative AI in Medicine** (3 credits)
This course provides a comprehensive overview of generative artificial intelligence (AI) and its applications in healthcare. Students will learn the fundamentals of generative models, including Generative Adversarial Networks (GANs), Variational Autoencoders (VAEs), and Diffusion Models. The

course will also cover advanced topics such as prompt engineering, retrieval augmented generation, and the deployment of generative AI in clinical settings. Through a combination of lectures, readings, and hands-on projects, students will gain a deep understanding of how generative AI can be leveraged to improve patient care, streamline clinical workflows, and advance medical research. The course will emphasize practical applications and use cases that do not require advanced coding or mathematical expertise.
*https://secure.aa.ufl.edu/Approval/reports/20023

• CAI 5XXX AI for Clinical Decision Support I (3 credits)
In this course, students will explore the current landscape of clinical artificial intelligence (AI) for augmenting patient care, including real-world deployments, promising cutting-edge research, and ethical and societal implications of current clinical AI progress. A hybrid flipped classroom/journal club structure which emphasizes peer engagement will empower students to join the ongoing conversation and become versed in the contemporary clinical AI topics that are currently shaping the field.
*https://secure.aa.ufl.edu/Approval/reports/20020

• CAI 5XXX AI-Powered Drug Discovery (3 credits)
This course explores the cutting-edge application of Artificial Intelligence (AI) in discovering novel compounds to be used as therapeutics. We will delve into the fundamental principles of machine learning and deep learning techniques used for virtual screening, lead optimization, and de novo molecule design. The course will also address the integration of biological data with AI models and explore the practical challenges and limitations of this approach.
*https://secure.aa.ufl.edu/Approval/reports/20022

• CAI 5XXX Supervised Research in AI for Health (1-6 credits)
Students will work with their primary advisor to design, develop, and complete an agreed-upon project. This course can be applied towards capstone project work or Master's Thesis work. However, only three credits of AIH YYYY Supervised Research can apply towards the 30 credits required for the M.S. degree.
*https://secure.aa.ufl.edu/Approval/reports/20021

F. For degree programs in medicine, nursing, and/or allied health sciences, identify the courses with the competencies necessary to meet the requirements in Section 1004.08, Florida Statutes. For teacher preparation programs, identify the courses with the competencies required in Section 1004.04, Florida Statutes.

☒ Not applicable to this program because the program is not a medicine, nursing, allied health sciences, or teacher preparation program.

G. Describe any potential impact on related academic programs or departments, such as an increased need for general education or common prerequisite courses or an increased need for required or elective courses outside of the proposed academic program. If the proposed program is a collaborative effort between multiple academic departments, colleges, or schools within the institution, provide letters of support or MOUs from each department, college, or school in Appendix D.

The proposed AIBHS program is unlike any other in the SUS: it will be UF College of Medicine program co-located in Gainesville and Jacksonville, its content is original, and its home in a center, as opposed to a department is ideal given the interdisciplinary nature of AI. New core, experiential learning, and elective courses will be created and taught by AI and clinical faculty in various departments. The added AI courses are especially beneficial to AI faculty and their home departments because they provide faculty with teaching opportunities required by their appointments and needed for tenure and promotion.

We do not anticipate any negative impact on other departments. We do, however, expect a benefit, such as more AI courses being available to students. Students in other departments who are interested in AI will have the opportunity to supplement their education with our AI courses, including our AI design studios, which will offer hands-on experience designing and validating trustworthy AI tools.

AIBHS courses will be designed and taught by faculty in the College of Medicine's Departments of Medicine, Radiology, Surgery, Pediatrics, Pharmacology and Therapeutics, and Neurology, as well as the College of Pharmacy's Department of Pharmaceutical Outcomes and Policy. Please see appendix D for emails from chairs of the above-mentioned departments showing their support of AIBHS and their willingness to allow their faculty to participate in the program.

H. Identify any established or planned educational sites where the program will be offered or administered. Provide a rationale if the proposed program will only be offered or administered at a site(s) other than the main campus.

AIBHS embraces clinical sites, practicums, and didactic teaching opportunities across UF College of Medicine's multiple campuses. Indeed, we are partnering with UF Health Jacksonville to create a program spanning both UF's main campus and UF Health Jacksonville. AIBHS will be administered here in Gainesville, and courses will be offered both here and in Jacksonville.

AI is a rapidly developing field that is fundamentally changing biomedical capabilities. Yet, health professional programs, such as medical doctor programs, do not include AI in their curricula. Compounding matters is insufficient focus on clinical biomedicine in current AI programs, even biomedical AI programs. Because of this, there is an imminent need to provide rapid AI upskilling for those interested in health professions, whether they be clinical or research oriented.

Offering courses at multiple sites will enable significantly more people to pursue the M.S. in a modality most conducive to their circumstances and learning style. First, offering courses in both Gainesville and Jacksonville will make it significantly easier for those living in either area to pursue the degree. This is especially true for potential students who are already in the workforce and may be working full-time. Indeed, we expect our program to be popular among those already in the workforce who want to enhance their knowledge and career trajectories. Second, although we intend to offer a digital option for our courses, many people prefer a face-to-face learning environment. This is likely to be true, especially in our AI design studio courses, experiential learning courses focused on hands-on experience designing, implementing, and using AI tools in clinical and research settings. The ability to offer courses in Gainesville and Jacksonville will give potential students a wider ability to customize their education to their circumstances, making it easier for them to succeed.

I. Describe the anticipated mode of delivery for the proposed program (e.g., face-to-face, distance learning, hybrid). If the method(s) of delivery will

require specialized services or additional financial support, describe the projected costs below and discuss how they are reflected in Appendix A – Table 3A or 3B.

We propose to use all three modes of delivery for the program: face-to-face, hybrid, and online. Students will have the option to learn didactically and experientially in person or synchronously online. Eventually, we plan to offer online courses with asynchronous content and synchronous discussion. Our goal is to build an accessible digital AI community of practice to support collective learning, training, and professional development.

J. Provide a narrative addressing the feasibility of delivering the proposed program through collaboration with other institutions, both public and private. Cite any specific queries of other institutions concerning shared courses, distance/distributed learning technologies, and joint-use facilities for research or internships.

AIBHS program directors are in continuing discussions to hammer out the partnership with UF Health Jacksonville. Given that the AIBHS program is committed to digital experiential learning communities, that many faculty have experience teaching online and hybrid courses, and the resources of both UF main campus College of Medicine and UF Health Jacksonville, including state-of-the-art clinical sites at both UF has the capacity to offer an exceptional program spanning its different campuses.

K. Describe any currently available sites for internship and/or practicum experiences. Describe any plans to seek additional sites in Years 1 through 5.

☐ Not applicable to this program because the program does not require internships or practicums.

<u>Currently available internship or practicum sites</u>
UF Health Shands Hospital, Gainesville: Given its focus on clinical research, this site is ideal for students interested in the medical applications of AI.

Sid Martin Biotechnology Institute, Alachua: This facility offers opportunities in biotechnological research, where AI algorithms are increasingly being applied for drug discovery.

UF Informatics Institute: Specializing in data science and computational research, the institute offers opportunities for students to engage in AI projects that can be applied to biomedical projects.

UF Innovation Hub: Aimed at fostering entrepreneurship, this site provides opportunities for students interested in the commercial aspects of AI and biomedical technologies.

Local Biotech Firms: A number of biotechnology companies around Gainesville offer internship programs that allow students to work on applied research projects.

UF Health Jacksonville: Given its focus on clinical research, this site is ideal for students interested in the medical applications of AI.

We will seek out additional internship and practicum sites, with a particular focus on Jacksonville locations, as the program grows.

V. Program Quality Indicators - Reviews and Accreditation

A. List all accreditation agencies and learned societies concerned with the proposed program. If the institution intends to seek specialized accreditation for the proposed program, as described in Board of Governors Regulation 3.006, provide a timeline for seeking specialized accreditation. If specialized accreditation will not be sought, please explain.

No specialized accreditation is needed for an M.S. degree in AIBHS. There is no accreditation agency for AI. M.S. graduates will be seeking jobs or applying to medical and doctoral programs, all of which will look for evidence of knowledge and hands-on experience in generating and analyzing genetic and genomic data, which will be provided by the M.S. program.

B. Identify all internal or external academic program reviews and/or accreditation visits for any degree programs related to the proposed program at the institution, including but not limited to programs within the academic unit(s) associated with the proposed degree program. List all recommendations from the reviews and summarize the institution's progress in implementing those recommendations.

Not applicable since this is an M.S. program.

C. For appropriate degree programs, discuss how employer-driven or industry-driven competencies were identified and incorporated into the curriculum. Additionally, indicate whether an industry or employer advisory council exists to provide input for curriculum development, student assessment, and academic-force alignment. If an advisory council is not already in place, describe any plans to develop one or other plans to ensure academic-workforce alignment.

Competencies were identified through experience on multi-institutional sponsored research projects, experience mentoring and directing students pursuing graduate degrees in engineering with a focus on machine learning and biomedical science, review of similar programs at other institutions (and determination of their strengths and weaknesses), assessment of current AI initiatives at the University of Florida, and assessment of federally sponsored research programs, such as the NIH's Bridge2AI program and the Advanced Research Projects Agency for Health (ARPA-H) program. These federally sponsored programs are designed to promote the development of innovative, "disruptive" engineering tools in healthcare.

Artificial intelligence is a rapidly evolving field, and workforce demands and requirements may shift over time. To ensure that proper academic-workforce alignment is always maintained, we will create an advisory council to monitor employer- and industry-driven competencies and recommend changes to the curriculum as needed. The advisory council will be comprised of representatives from key industry partners and collaborators across the state of Florida.

VI. Faculty Participation

A. Use Appendix A – Table 2 to identify existing and anticipated full-time faculty who will participate in the proposed program through Year 5, excluding

visiting or adjunct faculty. Include the following information for each faculty member or position in Appendix A – Table 2:

- **the faculty code associated with the source of funding for the position**
- **faculty member's name**
- **the highest degree held**
- **academic discipline or specialization**
- **anticipated participation start date in the proposed program**
- **contract status (e.g., tenure, tenure-earning, or multi-year annual [MYA])**
- **contract length in months**
- **percent of annual effort that will support the proposed program (e.g., instruction, advising, supervising)**

This information should be summarized below in narrative form. Additionally, provide the curriculum vitae (CV) for each identified faculty member in Appendix I.

Because COM faculty typically have lower teaching assignments, given their research and/or clinical duties, most, if not all, AIBHS courses will be team-taught. As a result, we are approaching faculty recruitment in phases. Phase 1 faculty includes course directors, course leads, as well as a subset of the faculty that will teach and design the courses. These faculty are listed in Appendix A – Table 2.

The majority of faculty are either tenured or tenure tracked and housed in the College of Medicine's Departments of Medicine, Radiology, Surgery, Pediatrics, Pharmacology and Therapeutics, and Neurology as well as the College of Pharmacy's Department pf Pharmaceutical Outcomes and Policy. (Emails indicating support from the chairs of these departments are included in Appendix D). Participating clinical faculty have MDs, usually along with PhDs, MSs or MPHs, which is to be expected given the expertise crucial for ensuring that students in the Clinical AI Design Studios acquire the appropriate clinical background. All other instructors have PhDs.

With the guidance of course directors, we will recruit more UF faculty in phase 2 to team teach, many of whom have already expressed enthusiasm for the program in informal discussions. We will update Appendices A, D, and E to reflect additional recruitment. In the meantime, we have included a New Hire (lecturer) in Appendix A – Table 2 whose FTE will change with the participation of more existing UF faculty. Although there is sufficient interest among existing UF faculty to teach and grow AIBHS' curriculum, we recommend making a new hire in Jacksonville to increase options for students who want to attend face-to-face courses while decreasing the amount of travel required for Gainesville-based faculty.

[NB – On the advice of the Provost's Office, I have provided some biosketches instead of CVs to reduce the length of this proposal. Some of the CVs are quite long, running over 50 pages. We're happy to provide CVs, too, if you'd like.]

B. Provide specific evidence demonstrating that the academic unit(s) associated with the proposed program has been productive in teaching, research, and service. Such evidence may include trends over time for average course load, FTE productivity, student HC in major or service courses, degrees granted, external funding attracted, and other qualitative indicators of excellence (e.g., thesis, dissertation, or research supervision).

The Intelligent Clinical Care Center (IC^3) has 29 faculty members who, combined, have over 1,200 publications and more than 60 grants. In addition to numerous graduate students supervised by

individual faculty members, IC^3 has developed and hosted several educational programs, including AI Bootcamps, Hackathon, and the in-development AI Passport program.

VII. Estimate of Investment

A. Use Appendix A – Table 3A or 3B to provide projected costs and associated funding sources for Year 1 and Year 5 of program operation. In narrative form, describe all projected costs and funding sources for the proposed program(s). Data for Year 1 and Year 5 should reflect snapshots in time rather than cumulative costs.

We are proposing to run AIBHS as a market-rate tuition program with operational costs paid by tuition revenue. Tuition is proposed at $1000 per credit hour for in-state and out-of-state students.

We project that 20 students, including part-time and full-time students, will enroll at .625 FTE collectively in Year 1, bringing tuition revenue to $300,000. Faculty will be paid their proportionate salary plus fringe for their effort. We anticipate $192,923.98 in faculty compensation in addition to a $69,700 administrative supplement to be paid to a faculty member acting as the academic director/graduate coordinator of the program. We also estimate an administrative program director at 1.0 FTE for $139,400, including fringe. (Whether this is necessary will depend on the speed at which AIBHS grows and the outcome of UF's College of Medicine's current restructuring of its graduate programs and services.) Marketing, recruitment, and enrollment services are estimated at 30% of tuition revenue ($90,000). Finally, we estimate RCM fees, 15% of program expenses, at $76,803.60. Total costs for Year 1 are thus projected at $588,827.58, leaving the program with a deficit of $288,827.58. (That said, we will make every effort to avoid a deficit by actively seeking program funding in advance of program launch: e.g., we are discussing funding possibilities with UF's College of Medicine, and we will apply for strategic funding at the next opportunity.)

In Year 5, we estimate that there will be 100 part-time and full-time students enrolled at an average .625 FTE, bringing tuition revenue to $1.5 million. Faculty will be paid $270,860.33, and the academic director/graduate coordinator will receive $73,944.73 as an administrative supplement. Given the estimated growth of the program, we anticipate paying a 1.0 FTE program director $147,889.46, as well as hiring additional administrative support for an added $100,000, including fringe. That staff will take over fiscal, HR, enrollment, and marketing. We have also allotted $100,000 for non-personnel advertising/marketing fees. Finally, RCM and other fees are budgeted 15% of program expenses and are estimated at $109,168.54. Total costs for Year 5 are projected at $836,958.80, resulting in a $663,041.20 profit for AIBHS.

B. Use Appendix A – Table 4 to show how existing Education & General (E&G) funds will be reallocated to support the proposed program in Year 1. Describe each funding source identified in Appendix A – Table 4, and justify below the reallocation of resources. Describe the impact the reallocation of financial resources will have on existing programs, including any possible financial impact of a shift in faculty effort, reallocation of instructional resources, greater use of adjunct faculty and teaching assistants, and explain what steps will be taken to mitigate such impacts.

Not applicable because this is a market-rate tuition program.

C. If the institution intends to operate the program as self-supporting, market tuition rate, or establish a differentiated graduate-level tuition, as described in Board of Governors Regulation 8.002, provide a rationale and a timeline for seeking Board of Governors' approval.

☐ Not applicable to this program because the program will not operate as self-supporting, market tuition rate, or establish a differentiated graduate-level tuition.

We propose to operate AIBHS as a market-rate tuition program. There are two reasons why we do so.

First, we propose to propose to house AIBHS in the College of Medicine's Intelligent Clinical Care Center, IC^3. IC^3's mission is to develop and provide sustainable support and leadership for transformative medical AI research, education, and clinical applications to advance patients' health in critical and acute care medicine. Its membership is interdisciplinary and includes faculty from UF's College of Medicine, Herbert Wertheim College of Engineering, College of Pharmacy, College of Public Health and Health Professions, College of Education, and the Institute of Food and Agricultural Science.

We believe that housing AIBHS in a center rather than a traditional academic unit will benefit the program and its students by providing a unique opportunity to be immersed in AI from a variety of perspectives, ensuring a deeper, more nuanced understanding than would be possible otherwise. AIBHS distinguishes itself by directly addressing a gap in specialized training. Traditional disciplines often lack a nuanced focus on biomedical and health-focused AI, while data science generally misses an emphasis on applications for translational biomedical domains and clinical settings. Indeed, to ensure trustworthy and fair development and application of AI tools towards patient care, translational research in medical AI requires a diversely trained faculty together, creating a unity of intellectual frameworks that goes beyond disciplinary boundaries.

However, because IC^3 is not a traditional academic unit, it does not yet have an appropriate administrative staff and academic support to manage the program. Staff will have to be redirected towards the AIBHS program or newly hired. Moreover, faculty from other departmental homes will be designing and creating entirely new courses for AIBHS. The majority of these faculty are AI faculty, clinical faculty, or both, who command high salaries and will need to be compensated accordingly. Compared to traditional programs, which can pay existing E&G staff and faculty self-supporting overload to support their programs, AIBHS will require additional revenue best made available through a market-rate tuition.

Second, AIBHS will span two campuses, Gainesville and Jacksonville, with classes offered at both sites. Adopting a market-rate tuition model will be necessary to recruit appropriate faculty and staff as well as to afford costs associated with instruction, administration, digital infrastructure, and facilities. Not only will this improve the efficiency and quality of the program, but it also enables us to respond more quickly to market fluctuations, including the ability to lower costs or offer financial assistance as the program scales up, thus making it more accessible to all.

Timeline

Date	Activity
March 2024	Submit M.S. New Degree proposal to Academic Approval Tracking System
April 2024	Meet with UF Teaching and Technology Distance Program Services for Market Research
April 2024	Apply for Strategic Funding
May 2024	Finalize budget
May 2024	Submit new course requests

Summer 2024	Determine marketing, student recruitment, and retention service
Fall 2024	Begin advertising, plan administrative structure
Spring 2025	Implement administrative structure; Advertising, recruitment
Summer 2025	Advertising, recruitment, and enrollment
Fall 2025	Launch AIBHS program with first cohort of incoming students

D. Provide the expected resident and non-resident tuition rate for the proposed program for both resident and non-resident students. The tuition rates should be reported per credit hour unless the institution has received approval for a different tuition structure. If the proposed program will operate as a continuing education program per Board of Governors Regulation 8.002, describe how the tuition amount was calculated and how it is reflected in Appendix A – Table 3B.

We propose to charge $1000 per credit hour, which is the average in-state tuition for the six programs most similar to AIBHS, which has the highest market share for CIP code 51.2706.

E. Describe external financial and in-kind resources available to support the proposed program and explain how this amount is reflected in Appendix A – Table 3A or 3B.

IC^3 has several in-kind resources available. Not only is it developing several biomedical AI modules whose materials will be made available to AIBHS, but it already has on staff a program director who will be well suited to administer AIBHS. (Program director cost is reflected in line 17 of Appendix A – Table 3B). Furthermore, IC^3 is located in Malachowsky Hall and presides over the AI Collaboratory space, a large, flexible area where students can learn, engage, and collaborate digitally and in person.

We are also actively working to raise funds. In addition to discussing funding opportunities with the College of Medicine, we will also apply for Strategic Funding at the next opportunity, which is scheduled for April 2024.

VIII. Self-Supporting and Market Tuition Rate Programs

Note: Skip this section If the proposed program will not operate as a self-supporting or market tuition rate program.

Proposed Program Type

☒ Market Tuition Rate Program

- **☐ Online**
- **☐ Continuing Education**

☐ Self-Supporting Program

☐ N/A

A. Provide supporting documentation in a separate attachment that serves as evidence that the new program will not supplant any existing similar or equivalent E&G degree offering. Describe the evidence in narrative form below. *Note that Board Regulation 8.002 considers a program similar if it is offered under the same CIP code as one funded under the E&G budget entity.*

The following programs have the same CIP code, 51.2706, as CAVP has approved for AIBHS: FIU's M.S. in Health Informatics and Analytics, USF's M.S. in Health Informatics, and UNF's M.S. in Health Informatics. Both FIU's and USF's programs are self-funded, according to administrators of the programs. Please see Appendix L for emails to this effect from FIU and USF.

UNF's program, in contrast, is an E&G program. However, it is quite different than the one proposed here. UNF's courses are primarily designed to train students in effective healthcare administration and management.

There is only one required course concerned with data, and it does not discuss AI. Indeed, there is very little AI training in UNF's curriculum. For documentation to this effect, see Appendix L for a screenshot of UNF's curriculum.

AIBHS, on the other hand, is an interdisciplinary AI program dedicated to teaching its students how to design, implement, and use AI systems in healthcare domains. Students will receive hands-on training in both clinical and biomedical settings. Consequently, we will attract different kinds of students. See Appendix L for a screenshot of UNF's curriculum.

B. If the proposed self-supporting or market tuition rate program will be a track under an existing E&G program or has a similar existing E&G program, provide a side-by-side tuition and fee comparison in the table below. Provide a link to the university's website that provides students with information about financial assistance and obligations for repayment of loans for these programs.

☒ Not applicable because the program will not be a track under an existing E&G program or is not similar to an existing E&G program.

Tuition and Fee Comparison

E&G Track or Program	Proposed Program

C. Explain whether the program leads to initial licensing or certification in occupational areas identified as a state critical workforce need. If so, which licenses and certifications will graduates receive upon completion, and explain why implementing the program as self-supporting or market tuition rate is the best strategy to increase the number of graduates in the state.

The are no specific licensing or certification requirements in occupational areas. The M.S. would serve to establish qualifications.

Note: Questions D – M pertain only to market tuition rate programs. If the proposed program will be self-supporting, skip to Section IX.

D. Explain the process used to determine the proposed market tuition rate and provide the tuition of similar programs offered by other SUS institutions and private institutions as appropriate so that the tuition of at least five similar programs is provided. If the proposed tuition rates differ for resident and non-resident students, explain why.

To determine anticipated demand and a reasonable cost to students, we have been working with UF Teaching and Technology's Office of Self-Supporting Programs. Dr. Jonathan Orsini and his team provided a market analysis; please see Appendix M.

Using Dr. Orsini's Table 1 (page 3), highlighting the top 30 institutions with market share for CIP code 51.2706, I compared curricula to determine which programs are most similar to the proposed AIBHS. They are Rutgers University, New Brunswick; New York University (NYU); University of Alabama Birmingham (UAB); Duke University; Stanford University; and University of South Florida (USF).

Before continuing, there are three points to note: (1) I include USF for the sole reason that it's the most similar program to AIBHS in the SUS; however, it offers no substantive training in AI/ML training, which is significantly different from AIBHS; (2) Stanford's program requires its students to have strong computational backgrounds, whereas AIBHS doesn't; and (3) UAB offers a graduate certificate, not an M.S.

Institution	Master's Completions 2022	Growth % YOY 2022	Market Share 2022	IPEDS Tuition & Fees 2022 In-state	IPEDS Tuition & Fees 2022 Out of State
Rutgers Univ.-New Brunswick	326	1.60%	4.90%	$779	$1,325
New York Univ.	307	26.90%	4.60%	$2,074	$2,074
Univ. of South Florida	300	-18.70%	4.50%	$435	$880
Univ. of Alabama at Birmingham	135	36.40%	2.00%	$468	$1,109
Duke Univ.	87	10.10%	1.30%	$3,495	$3,495
Stanford Univ.	60	66.70%	0.90%	$1,255	$1,255

The average in-state cost per credit hour for these programs is $1,417.67; the out-of-state average is $1,689.67. If we set aside Duke, since it's clearly an outlier, the average cost per credit hour for in-state and out-of-state students is $1,002.20 and $1,328.60, respectively.

Given the evidence of the demand for these programs [See Appendix M], UF's resources (e.g., HiPerGator), its numerous pre-eminent biomedical AI faculty, as well as its flagship status, and emergence as a university specializing in AI, we believe that $1000 per credit hour is reasonable and sustainable.

E. Explain how offering the proposed program at a market tuition rate is aligned with the university's mission. If the program qualifies as a Program of Strategic Emphasis, provide additional justification for charging higher tuition for the proposed program.

In addition to the University of Florida's central mission to cultivate and provide exceptional teaching, research, and service, it is also committed to becoming the top university for AI. AIBHS can best further this mission by implementing a market rate, even though it qualifies as a Program of Strategic Emphasis.

Let me begin by explaining why we are requesting $1000 per credit hour.

First, no departments in the SUS offer programs that sufficiently bridge the gap between AI, the biomedical sciences, and the clinical sciences. In part, this is because the range of expertise necessary for doing so doesn't fit well into traditional ways of demarcating disciplines. Thus, housing AIBHS in a center embracing various disciplines, such as IC^3 is ideal. However, centers cannot receive E&G funds or state-generated revenue; consequently, a program so housed must be financially self-reliant. Second, faculty with AI expertise are in high demand; they are experts in cutting-edge and lucrative fields. They cannot be expected to participate if they are not compensated appropriately. Satisfying these desiderata requires higher tuition rates than usual and $1000 per credit hour, which enables AIBHS to become profitable in year 4 of the program.

Such investment is worth the price.

Students will learn from pre-eminent faculty at the vanguard of their fields, positioning them to pioneer new innovations that advance biomedical research, streamline healthcare systems and processes, and improve patient care. Research will be advanced through discovery and new collaborations at multiple sites. Finally, the community will benefit in numerous ways: it will have new educational opportunities offered in different modalities suitable for different needs; industry will have a larger pool of qualified applicants; students will have higher earning potential, benefitting the local economy; and the community will enjoy improved medical care.

Given that AIBHS will serve to upskill the existing workforce as well as those preparing to enter it, we are committed to offering an excellent program at an accessible rate. As the program scales up, a market rate tuition model frees AIBHS to offer financial support to those who need it and to potentially lower the cost per credit hour.

In short, the nature of AIBHS is such that a market rate best enables it to advance UF's mission and modulate to the market while remaining self-reliant.

F. Provide a declaratory statement that offering the proposed program at the market tuition rate does not increase the state's fiscal liability or obligation.

We hereby declare that offering AIBHS at the market tuition rate of $1000 per credit hour will not increase the state's fiscal liability or obligation.

G. Explain any proposed restrictions, limitations, or conditions to be placed on the program.

Not applicable

H. Explain how the university will ensure sufficient courses are available to meet student demand and facilitate program completion.

UF already has numerous faculty members who are well-qualified to teach these courses, many of whom are AI faculty members who would benefit from more teaching opportunities in their areas. We will increase faculty participation as student demand increases. We are confident we can do so, given that we will offer commensurate compensation. As the program scales up, market-rate tuition will enable us to recruit any necessary additional faculty.

I. If applicable, provide a baseline of current enrollments, including a breakout of resident and non-resident enrollment in similar courses funded by the E&G budget entity.

Not applicable

J. Describe any outcome measures that will be used to determine the program's success.

Graduation rates: 80% or more 4-year graduation rate; enrollment rates: 25% enrollment growth per year; career placement: 95% job placement or promotion within 1 year of graduating from the program, student surveys with an aggregate average score of 80% (satisfaction) or better; and financial sustainability (profitability by the end of year 4).

K. List the campuses and/or sites at which the proposed program will be offered. If the program is only offered online, indicate that, and provide the location from which the program will be managed.

Courses will be offered at UF's main campus in Gainesville, at UF Health Jacksonville, and, if approved, at the proposed UF Jacksonville campus. Hybrid courses will be offered – providing simultaneous virtual and in-person learning. AIBHS, however, will be managed in Gainesville by UF's College of Medicine's Intelligent Clinical Care Center (IC^3).

L. Provide an estimate of the total and net annual revenue the university anticipates collecting for Years 1 and 5 if the proposal is approved. This information should be consistent with the data provided in Appendix A – Table 3B, which is required as a part of this proposal.

If approved, we estimate that the program will run a deficit of $288,827.58 in year 1 and a profit of $663,041.20 in year 5. To offset the projected deficit and maintain non-E&G cost recovery, we will apply for strategic funding at the next opportunity, which is expected to be in April 2024.

M. Describe how revenues will be spent, including whether private vendors will be utilized and for what purpose. Additionally, identify all budget entities used for the program.

Market rate tuition revenue will only be spent on programmatic expenses, reinvested to enhance the instructional quality of the program, or spent as financial support for prospective students. Initially, AIBHS will partner with the UF Operational Services Unit, which will provide advertising, recruiting, admissions, and application support services for a 30% share of revenue. As the program grows, we expect to need two additional full-time administrative positions, which will include an academic specialist and an administrative specialist to manage the financial and human resource needs of the program, eventually taking over these duties from UF Operational Services Unit. These staff positions will be entirely funded through market-rate tuition, and we estimate that with fringe, these positions will cost the program $100,000 annually. With sufficient staffing, we also plan to take over program marketing, and we have allocated an additional $100,000 per year for non-personnel-related costs. Moreover, because AIBHS will be co-located between Gainesville and Jacksonville, with face-to-face courses offered at both, we have allotted $20,000 per year for travel. And, of course, as the program grows and AI technology advances, we will offer more courses, which will involve more faculty and course development costs.

These investments will ensure the quality and long-term success of what we anticipate will be a flagship program for the UF in both Gainesville and Jacksonville. It is critical, therefore. that the quality of instruction available to students is of the highest caliber possible. It is highly unlikely that AIBHS could accomplish these goals without market-rate tuition. See Appendix A – Table 3B for more details.

IX. Non-Faculty Resources

A. Describe library resources currently available to implement and/or sustain the proposed program through Year 5 below, including but not limited to the following:

- **the total number of volumes and serials available in the discipline and related disciplines**
- **all major journals that are available to the university's students**

The Library Director must sign the additional signatures page to indicate they have reviewed Sections IX.A. and IX.B.

The George A. Smathers Libraries at the University of Florida hold over 6.7 million print volumes 2.1 million e-books and provide access to over 190,000 full-text print and electronic journals, as well as over 1,000 electronic databases. A free interlibrary loan service allows faculty, students, and staff to access external resources that are not included in the library's on-site and electronic collections. The Libraries offer a video production studio, maker-spaces, and a virtual and augmented reality lab. All campus libraries host computer labs managed by Academic Technology, which provide access to specialized software, including ArcGIS, CAD, Adobe Creative Cloud, and more. The Libraries provide expertise in Natural Language Process, Informatics, GIS, and Data Management.

The UF Libraries expend over $12 million annually on electronic resources. Listed below is a selection of important journals available through UF Libraries that will support students in this program. Due to the interdisciplinary nature of artificial intelligence and data science, this is only a representative list.

- ACM Transactions on Knowledge Discovery from Data
- Artificial Intelligence
- Artificial Intelligence in Medicine
- Artificial Intelligence Review
- Big Data Research
- Data Mining and Knowledge Discovery
- IEEE Journal of Biomedical and Health Informatics

- IEEE Transactions on Knowledge and Data Engineering
- International Journal of Data Science and Analytics
- International Journal of Machine Learning and Cybernetics
- Journal of the American Medical Informatics Association
- Journal of Healthcare Informatics Research
- Journal of Intelligent Information Systems
- Journal of Machine Learning Research
- Machine Learning
- SIGKDD Exploration
- Statistical Analysis and Data Mining
- Wiley Interdisciplinary Reviews: Data Mining and Knowledge Discovery

In addition, there are a growing number of open-access journals in the field; the content of these journals is freely available to readers and is discoverable through the UF libraries catalog and journal databases. Here are several relevant open-access journals:

- Applied Artificial Intelligence
- BioData Mining (BMC)
- BMC Bioinformatics
- BMJ Health & Care Informatics
- EPJ Data Science (Springer Open)
- JMIR Medical Informatics
- Journal of Big Data (Springer Open)
- Journal of Data Science
- Journal of Intelligent Learning Systems and Applications
- Radiology - Artificial Intelligence
- Transactions on Machine Learning and Data Mining

The Libraries offer consultations, workshops, and events throughout the year, and this program has the support of the following professionals: 8 Health Sciences Librarians who serve as liaisons to various departments in the College of Medicine, Natural Language Processing Specialist, Informatics Librarian, Bioinformatics Librarian, Computer Science & Engineering Librarians, Geospatial Information Services (GIS) Librarian, and other members of the Smathers Libraries' Academic Research Consulting and Services (ARCS) team.

B. Discuss any additional library resources needed to implement and/or sustain the program through Year 5. Describe how those costs are reflected in Appendix A – Table 3A or 3B.

☒ **Not applicable to this program because no additional library resources are needed to implement or sustain the proposed program.**

C. Describe any specialized equipment and space currently available to implement and/or sustain the proposed program through Year 5.

In addition to biomedical laboratories run by College of Medicine faculty and clinical sites in UF Health hospitals, AIBHS will leverage several modern resources of Malachowsky Hall for Data Sciences &

Information Technology, a recently completed 263,000-square-foot facility at the heart of the main UF campus that brings together faculty and students from key departments in the Colleges of Engineering and Medicine to reimagine transformative AI research. Malachowsky Hall includes numerous flexible classrooms that can be altered to complement various innovative teaching methods, encouraging innovative pedagogical approaches and interactive, cross-disciplinary learning. There are an additional 30 lab spaces designed to encourage cross-pollination among researchers from different fields. The building also includes office spaces for student groups and a makerspace that can be reserved for tech workshops and other student-developed collaborations and prototyping.

All AIBHS graduate students will also have access to HiPerGator, the UF supercomputing cluster that includes the latest generation of AI hardware. HiPerGator has enabled unprecedented AI capability at the University of Florida and across the state of Florida. Students will utilize HiPerGator for all AI coursework and projects.

D. Describe any additional specialized equipment or space needed to implement and/or sustain the proposed program through Year 5. Include any projected Instruction and Research (I&R) costs of additional space in Appendix A – Table 3A or 3B. Costs for new construction should be provided in response to Section IX.E. below.

☒ Not applicable to this program because no new I&R costs are needed to implement or sustain the program through Year 5

E. If a new capital expenditure for instructional or research space is required, indicate where this item appears on the university's fixed capital outlay priority list. Appendix A – Table 3A or 3B includes only I&R costs. If non-I&R costs, such as indirect costs affecting libraries and student services, are expected to increase due to the program, describe and estimate those expenses in narrative form below. High enrollment programs, in particular, are expected to necessitate increased costs in non-I&R activities.

☒ Not applicable to this program because no new capital expenditures are needed to implement or sustain the program through Year 5.

F. Describe any additional special categories of resources needed to operate the proposed program through Year 5, such as access to proprietary research facilities, specialized services, or extended travel. Explain how those projected costs of special resources are reflected in Appendix A – Table 3A or 3B.

☒ Not applicable to this program because no additional special categories of resources are needed to implement or sustain the program through Year 5.

G. Describe fellowships, scholarships, and graduate assistantships to be allocated to the proposed program through Year 5 and explain how those are reflected in Appendix A – Table 3A or 3B.

☒ Not applicable to this program because no fellowships, scholarships, and/or graduate assistantships will be allocated to the proposed program through Year 5.

X. Required Appendices

The appendices listed in tables 1 & 2 below are required for all proposed degree programs except where specifically noted. Institutions should check the appropriate box to indicate if a particular appendix is included to ensure all program-specific requirements are met. Institutions may provide additional appendices to supplement the information provided in the proposal and list them in Table 2 below.

Table 1. Required Appendices by Degree Level

Appendix	Appendix Title	Supplemental Instructions	Included Yes/No	Required for Degree Program Level		
				Bachelors	Masters/ Specialist	Doctoral/ Professional
A	Tables 1-4			X	X	X
B	Consultant's Report and Institutional Response					X
C	Academic Learning Compacts	Include a copy of the approved or proposed Academic Learning Compacts for the program.		X		
D	Letters of Support or MOU from Other Academic Units	Required only for programs offered in collaboration with multiple academic units within the institution		X	X	X
E	Common Prerequisite Request Form	This form should also be emailed directly to the BOG Director of Articulation before submitting the program proposal to the Board office for review.		X		
F	Request for Exemption to the 120 Credit Hour Requirement	Required only for baccalaureate degree programs seeking approval to exceed the 120 credit hour requirement		X		
G	Request for Specialized Admissions Status	Required only for baccalaureate degree programs seeking approval for specialized admissions status		X		

H	Attestations for Self-Supporting and Market Tuition Rate Programs	Required only for self-supporting or market tuition rate programs			X	X
I	Faculty Curriculum Vitae			X	X	X

Table 2. Additional Appendices

Appendix	Appendix Title	Description
K	Sources for table 'Job Opportunities for AIBHS Graduates'	Citations for data used in that table
L	CIP Code Institutions	Documentation that other FL SUS schools with the same CIP code either are not E&G programs OR have a very different curriculum than AIBHS
M	Market Analysis for Master of Science in Artificial Intelligence in Biomedical & Health Sciences	Provided by UF Teaching and Technology's Office of Self-Supporting Programs

MS in Artificial Intelligence for Biomedical and Health Sciences Curriculum

Proposed by the 2023-2024 AIBHS Committee

Table of Contents

Advisory Committee Members

Azra Bihorac, MD, MS FCCM, FASN, Senior Associate Dean for Research, Professor of Medicine, Surgery and Anesthesiology, Director of Intensive Critical Care Center, **program director**	Benjamin Shickel, PhD, Division of Nephrology, Hypertension & Renal Transplantation, Department of Medicine, **program co-director**	Wei Shao, PhD, Division of Nephrology, Hypertension & Renal Transplantation, Department of Medicine, **program co-director**	Pinaki Sarder, PhD, Quantitative Health, Department of Medicine, committee member
Ramon Sun, PhD, Biochemistry and Molecular Biology, committee member	Elizabeth Palmer, PhD, Office of Research, Assistant Director of Education and Training		

Program Description

Overview of the Curriculum

The proposed Artificial Intelligence for Biomedical and Health Sciences (AIBHS) program will offer a Master of Science (MS). The MS is a 30-credit-hour program consisting of a set of four core courses (11 credit

hours), four experiential learning courses (10 credit hours), and four electives (12 credit hours). All courses are letter graded, and the courses listed below will be administered through the Intelligent Clinical Care Center, IC^3, home of the AIBHS program. To complete the program, a student must also pass a final oral examination, submit a passing capstone project, or submit and successfully defend a master's thesis.

The 4 core courses (11 credits) are:

- CAI 5XXX Fundamentals of AI in Medicine I (3 credits) [course request 19996]
- CAI 5XXX Fundamentals of AI in Medicine II (3 credits) [course request 19997]
- CAI 5XXX Biostatistics for AI (2 credits) [course request 20019]
- CAI 5XXX Economic, Social, Legal and Ethical Implications of AI in Medicine (3 credits) [course request 19995]

The 4 required experiential learning courses (10 credits) are:

- CAI 5XXX AI Design Studio I (1 credit) [course request 19998]
- CAI 5XXX AI Design Studio II (3 credits) [course request 19999]
- CAI 6XXX Clinical AI Design Studio I (3 credits) [course request 20000]
- CAI 6XXX Clinical AI Design Studio II (3 credits) [course request 20017]

Students must also earn 9 credit hours total in electives.
Of the 4 electives (12 credits) listed below, students must take 6 credit hours:

- CAI 5XXX AI in Medical Image Analysis (3 credits) [course request 20018]
- CAI 6XXX Applied Generative AI in Medicine (3 credits) [course request 20023]
- CAI 5XXX AI for Clinical Decision Support (3 credits) [course request 20020]
- CAI 5XXX AI-Powered Drug Discovery (3 credits) [course request 20022]

Students may choose to earn the remaining three elective credit hours by taking:

- CAI 6XXX Supervised Research in AI for Health (1-6 credits) [course request 20021]

Intended Student Population

The graduate program in AIBHS aims to train professionals in leveraging AI techniques for innovative solutions for biomedical research, healthcare analytics, and precision medicine. The AIBHS program seeks to enroll students who demonstrate a blend of academic excellence, leadership capabilities, and unwavering determination. It welcomes candidates with diverse backgrounds, including medical students and students in fields like biological or medical sciences, biostatistics, bioinformatics, biomedical engineering, and computer science. Ideal applicants include students pursuing professional medical degrees such as an MD, as well as individuals with strong computing skills and undergraduate degrees in biology, chemistry, microbiology, biostatistics, or engineering. Additionally, students working toward a PhD in areas such as cell biology, neuroscience, and biostatistics may also find that this program aligns well with their academic and professional goals, offering a unique opportunity to pursue an MS degree in AIBHS.

Curriculum Management

AIBHS will be housed in the Intelligent Clinical Care Center in UF's College of Medicine (COM). Its management and curriculum development will be overseen by a committee primarily composed of faculty members from Quantitative Health (Medicine). This curriculum committee will also include faculty from the COM who actively conduct research related to clinical science, artificial intelligence, machine learning, and computational science.

The AIBHS curriculum is designed to equip students with a comprehensive understanding of AI and machine learning in clinical settings, focusing on precision medicine and the evolving use of AI in improving human health. Recognizing the rapid evolution in this field, the curriculum will be regularly reviewed and updated to remain at the forefront of technological advancements. These updates will primarily involve the introduction of new clinical AI courses. Additionally, admission and graduation requirements will be adjusted as necessary to align with emerging trends and needs. Any modifications will require approval from the curriculum committee and must comply with the Graduate School regulations.

Admission Requirements

To be admitted into the M.S. in AIBHS, candidates must graduate from an accredited baccalaureate program with either a B.S. in a relevant discipline or by demonstrating academic and research excellence through work in multidisciplinary courses. While not mandatory, a strong background in either biomedical sciences, preferably with clinical experience, or computing, evidenced by proficiency in modern programming languages such as Python or R, is highly desirable. In addition to these criteria, all applicants must meet the following requirements:

GPA: Minimum of 3.0

GRE: Waived

Admission criteria into the AIBHS MS program following enrollment in or completion of a professional medical degree, such as an MD, remain the same as for students entering the program with a BS.

International applicants are exempt from the English proficiency requirement after completing one academic year at a recognized, regionally accredited university or college in a country where English is the official language. Students will have to meet all requirements of the University of Florida Graduate School Admissions and the following requirements:

TOEFL: 550 on paper-based; (213 on computer-based; 80 on Internet-based)

TOEFL may be substituted with IELTS: 6 or MELAB: 77

Transfer of credits from another institution or program to count towards the AIBHS the MS degree is only accepted “under case-by-case circumstances and assessments” through a formal petition process. Acceptance of credit transfer requires the approval of the AIBHS committee and the Dean of the Graduate School. Furthermore, this process will be subject to the limits and conditions set forth by the UF Graduate School and the College of Medicine. Petitions for transfer of credit should be made during the student’s first term of enrollment in the AIBHS program. Only graduate-level (5000-7999) work, earned with a grade of A, A-, B+, or B, is eligible for transfer of credit.

In accordance with UF’s Graduate School policy, no more than 15 transfer credits towards the MS are allowed, and “[t]hese can include no more than 9 credits from institution/s approved by UF, with the balance obtained from postbaccalaureate work at the University of Florida.” (https://gradcatalog.ufl.edu/graduate/degrees/).

Because AIBHS is an interdisciplinary program, students will secure dual mentors: one with relevant technical expertise, the other with clinical expertise. One of the dual mentors will serve as the student’s primary advisor. In cases where a mentor has expertise in both domains, one mentor suffices.

Graduation Requirements

The appropriate grade point requirements for graduation are:

1. A minimum grade of 3.00 (B or higher) in each core course
2. An overall GPA of 3.00 or higher across all elective courses

Successful completion of the MS requires that a student either successfully completes an oral final examination, a capstone project, or a Master’s thesis, which includes a successful defense.

Final Oral Examination:

Students pursuing the final oral examination option for completing the MS are expected to take and pass the exam in the semester at the end of which they plan to graduate. The oral examination is comprehensive and will be administered by 2-3 faculty members of IC^3, who will be selected by the graduate committee.

The oral examination is pass/fail and will use questions from a list of topics drawn from the courses the student has taken. Faculty who have taught those courses in recent semesters will provide the graduate committee with at least two potential exam questions whose correct answers exhibit appropriate understanding of the field. Graduate students scheduled to take the Final Exam shall be given the list of topics from which the questions are to be drawn two weeks prior to their examination.

The final oral examination is pass/fail. Faculty conducting the oral examination are responsible for determining whether the students have passed. Students who do not pass have one opportunity to take the final oral examination again.

Capstone Project:

Students pursuing the capstone project option must select a supervisory chair or primary advisor by the end of Year 1 Spring Semester. The supervisory chair or primary advisor will guide the student in the development of the project. Students are strongly encouraged to enroll for 3 credits of AIH YYYY Supervised Research in the Fall semester of their second year and are required to do so in the Spring semester of their second year. The capstone project will be designed in consultation with the student's supervisory chair and will demonstrate mastery of an agreed upon topic in the area.

Proposal: Students will be required to develop and submit a proposal for their capstone research project. This should outline the project's objectives, methodology, expected outcomes, and timeline.

Conducting the Research: Over the course of the project, students are expected to rigorously conduct the research outlined in their proposal. This typically includes the collection and analysis of clinical data, development and refinement of AI models, and careful interpretation and validation of the results. Additionally, students should be prepared to adjust their research approach based on emerging data and findings. This iterative process is crucial for ensuring the research remains relevant, accurate, and aligned with the project's objectives.

Final Report: Upon completion of the research, students must prepare a comprehensive written report. This should discuss the research question, methods used, results obtained, and the significance of the findings. Depending on the initial commitment with the Supervisory Chair, students may also need to defend their project in an oral examination. Students may be required to attend and sometimes present at a certain number of departmental seminars, workshops, or conferences. The overall process encourages students to engage with the wider academic community and stay informed about current research in their field.

Successful capstone project completion depends on approval of the final report or thesis from a committee of three faculty members, including the student's supervisory chair.

Master's Thesis:

Students pursuing the thesis option must initiate a supervisory committee of faculty members, which must be established by the end of year 1 Spring semester. Students are strongly encouraged to enroll for 3 credits of AIH YYYY Supervised Research in the Fall semester of their second year and are required to do so in the Spring semester of their second year. "The supervisory committee for a master's degree with a thesis should consist of at least three Graduate Faculty members, unless otherwise specified. Each master's thesis candidate must prepare and present a thesis that shows independent investigation. It must be acceptable, in form and content, to the supervisory committee and to the Graduate School. The work must be of publishable quality and must be in a form suitable for publication, guided by the Graduate School's format requirements." For more on graduate school requirements, see https://gradcatalog.ufl.edu/graduate/degrees/.

Course Descriptions

Core Course Descriptions

• **CAI 5XXX Fundamentals of AI in Medicine I** (3 credits)
This course introduces the fundamental concepts of Artificial Intelligence and Machine Learning (AI/ML) with a focus on applications in the medical field. It covers foundational AI/ML concepts, diverse medical data sources, and the complete lifecycle of AI/ML in healthcare, complemented by insights into model evaluation and ethical considerations. The course offers a mix of lectures, hands-on labs, and project work, emphasizing practical application in real-world scenarios.
* https://secure.aa.ufl.edu/Approval/reports/19996

• **CAI 5XXX Fundamentals of AI in Medicine II** (3 credits)
Building on the foundational concepts introduced in Fundamentals of Artificial Intelligence in Medicine I, this course explores deeper into Artificial Intelligence (AI), with a specific focus on deep learning and its applications in the field of medicine. Students will learn more advanced deep learning architectures, including convolutional neural networks (CNNs), recurrent neural networks (RNNs), and transformers. The curriculum emphasizes practical applications, using these technologies to analyze medical imaging, interpret clinical notes, and mine electronic health records.
*https://secure.aa.ufl.edu/Approval/reports/19997

• **CAI 5XXX Biostatistics for AI in Medicine** (2 credits)
This course highlights the crucial role of biostatistics in AI-driven medical applications. Students will master foundational biostatistical methods, design effective medical experiments, and navigate the intricacies of large biomedical datasets. Emphasizing the union of traditional biostatistics with contemporary AI techniques, the course ensures proficiency in data analysis, AI model validation, and addressing ethical challenges in medical data use. Through lectures, labs, and case studies, participants will be adept at bridging the gap between AI, medicine, and biostatistical principles.
*https://secure.aa.ufl.edu/Approval/reports/20019

• **CAI 5XXX Economic, Social, Legal, and Ethical Implications of AI in Medicine** (3 credits)
This course provides an in-depth exploration of the intersection between Artificial Intelligence (AI) and society, with a focus on alignment, ethics, economic implications, and legal policy. Students will analyze the ethical dilemmas arising from AI technologies, including biases, fairness, transparency, accountability, and privacy; analyze potential economic disruptions and identify strategies for inclusive growth and equitable distribution of AI-generated benefits; examine existing and emerging legal and regulatory frameworks governing AI technologies, including data protection, intellectual property, liability, and accountability; and study policy approaches and initiatives at the national and international levels aimed at fostering responsible AI development and deployment.
*https://secure.aa.ufl.edu/Approval/reports/19995

Experiential Learning Course Descriptions

• **CAI 5XXX AI Design Studio I** (1 credit)
This experiential seminar course will feature numerous faculty experts from diverse backgrounds who will guide students through more than a dozen unique real-world examples of machine learning for healthcare applications. Students will gain valuable experience in designing, developing, and deploying AI systems using contemporary tools, models, and platforms. Through a series of interactive and open-ended vignettes, rotating panels of AI and physician-scientists will guide students through the design and application of end-to-end ML

systems. Faculty on the cutting-edge of medical AI research will foster an environment of innovation, creativity, and nonlinear thinking via project-based experiential learning.
*https://secure.aa.ufl.edu/Approval/reports/19998

• **CAI 5XXX AI Design Studio II** (3 credits)
AI Design Studio II is an experiential applied research course in which each student will propose a self-directed clinical AI research project that addresses a real-world healthcare challenge and spend the full semester building and testing their AI system. Students will be supervised by an AI faculty member as they organize, develop, evaluate, and refine their approach. This course follows the guided experiential learning and high-level overview of the clinical AI landscape presented in AI Design Studio I. Students will be paired with a technical AI faculty member whose research aligns with the student's proposed project. AI Design Studio II is focused on refining technical methods on retrospective datasets and will prepare students for prospective and immersive aspects of Clinical AI Design Studio I rotations.
*https://secure.aa.ufl.edu/Approval/reports/19999

• **CAI 6XXX Clinical AI Design Studio I** (3 credits)
Clinical AI Design Studio I offers an immersive learning experience for students interested in the intersection of artificial intelligence (AI) and clinical practice. Throughout the semester, students will participate in rotations, spending time working in various faculty members' labs or clinical domains. These rotations provide a unique opportunity to delve into various research domains and acquire valuable insights into ongoing clinical AI initiatives. Additionally, they provide hands-on experience and real-world exposure, informing and inspiring the implementation of AI innovations within clinical settings. Students will not only observe but may actively contribute to the work happening in these labs, acquiring practical skills related to AI development, data analysis, and clinical problem-solving. The course emphasizes understanding the clinical context, allowing students to apply AI technologies to real-world healthcare challenges. At the end of the course, students will decide who they want as their clinical advisor, informed by their experiences during rotations and their alignment with specific research interests. They will join the selected clinical advisor for **Clinical AI Design Studio II** for a more in-depth experience.
*https://secure.aa.ufl.edu/Approval/reports/20000

• **CAI 6XXX Clinical AI Design Studio II** (3 credits)
Students will embark on an immersive journey into the world of clinical artificial intelligence with Clinical AI Design Studio II. This course offers a unique, extended engagement with a faculty advisor, building upon the foundational experiences from Clinical AI Design Studio I. Students will delve into the specialized clinical domain of their advisor, gaining firsthand insights into the intricacies of patient care and medical decision-making processes. Throughout the term, students will integrate into their advisor's research lab, contributing to a significant research project. This hands-on experience is designed to enhance students' understanding of the clinical application of AI technologies. They will acquire and refine critical skills in project conceptualization, robust study design, effective study execution, and the strategic deployment of AI models within a real-world clinical setting. The course structure is tailored to foster a collaborative learning environment, with a blend of mentor-guided research, interdisciplinary teamwork, and independent study. Students will participate in regular lab meetings, engage in critical discussions on current AI research, and receive personalized mentorship to guide their project development.
*https://secure.aa.ufl.edu/Approval/reports/20017

Elective Course Descriptions

• **CAI 5XXX AI in Medical Image Analysis** (3 credits)

Medical imaging refers to technologies that visualize the interior of the human body. Over the last decades, medical imaging has become an increasingly important tool for the early diagnosis, prognosis, and treatment of various diseases. This course will focus on recent advances in artificial intelligence for medical image analysis. Topics covered in this course include (1) Basics of medical imaging, (2) Image visualization, (3) Convolutional neural networks, (4) Image classification, (5) Image segmentation, (6) Transformer networks, (7) Image registration, (8) Generative adversarial networks, (9) Image-to-image translation, (10) Image super-resolution, (11) Diffusion Models.
*https://secure.aa.ufl.edu/Approval/reports/20018

• **CAI 5XXX Applied Generative AI in Medicine** (3 credits)
This course provides a comprehensive overview of generative artificial intelligence (AI) and its applications in healthcare. Students will learn the fundamentals of generative models, including Generative Adversarial Networks (GANs), Variational Autoencoders (VAEs), and Diffusion Models. The course will also cover advanced topics such as prompt engineering, retrieval augmented generation, and the deployment of generative AI in clinical settings. Through a combination of lectures, readings, and hands-on projects, students will gain a deep understanding of how generative AI can be leveraged to improve patient care, streamline clinical workflows, and advance medical research. The course will emphasize practical applications and use cases that do not require advanced coding or mathematical expertise.
*https://secure.aa.ufl.edu/Approval/reports/20023

• **CAI 5XXX AI for Clinical Decision Support I** (3 credits)
In this course, students will explore the current landscape of clinical artificial intelligence (AI) for augmenting patient care, including real-world deployments, promising cutting-edge research, and ethical and societal implications of current clinical AI progress. A hybrid flipped classroom/journal club structure which emphasizes peer engagement will empower students to join the ongoing conversation and become versed in the contemporary clinical AI topics that are currently shaping the field.
*https://secure.aa.ufl.edu/Approval/reports/20020

• **CAI 5XXX AI-Powered Drug Discovery** (3 credits)
This course explores the cutting-edge application of Artificial Intelligence (AI) in discovering novel compounds to be used as therapeutics. We will delve into the fundamental principles of machine learning and deep learning techniques used for virtual screening, lead optimization, and de novo molecule design. The course will also address the integration of biological data with AI models and explore the practical challenges and limitations of this approach.
*https://secure.aa.ufl.edu/Approval/reports/20022

• **CAI 5XXX Supervised Research in AI for Health** (1-6 credits)
Students will work with their primary advisor to design, develop, and complete an agreed-upon project. This course can be applied towards capstone project work or Master's Thesis work. However, only three credits of AIH YYYY Supervised Research can apply towards the 30 credits required for the M.S. degree.
*https://secure.aa.ufl.edu/Approval/reports/20021

Course Sequence

Full-time student course sequence sample [Exam Option]

Fall Year 1 [9 credits]	Spring Year 1 [9 credits]	Summer Year 1 [3 credits]

• CAI 5XXX Fundamentals of AI in Medicine I (3) • CAI 5XXX AI Design Studio I (1) • CAI 5XXX Biostatistics for AI in Medicine (2) • Elective (3) – e.g., CAI 5XXX AI in Medical Image Analysis	• CAI 5XXX Fundamentals of AI in Medicine II (3) • CAI 5XXX AI Design Studio II (3) • Elective (3) – e.g. CAI 6XXX Applied Generative AI in Medicine	• CAI 6XXX Clinical AI Design Studio I (3)

Fall Year 2 [9 credits]	Spring Year 2	Summer Year 2
• CAI 6XXX Clinical AI Design Studio II (3) • CAI 5XXX Economic, Social, Legal and Ethical Implications of AI in Medicine (3) • Elective (3) – CAI 5XXX AI for Clinical Decision Support (3) **Graduation**		

Full-time student course sequence sample [Thesis/Capstone project option]

Fall Year 1 [9 credits]	Spring Year 1 [9 credits]	Summer Year 1 [3 credits]
• CAI 5XXX Fundamentals of AI in Medicine I (3) • CAI 5XXX AI Design Studio I (1) • CAI 5XXX Biostatistics for AI in Medicine (2) • Elective (3) – e.g., CAI 5XXX AI in Medical Image Analysis	• CAI 5XXX Fundamentals of AI in Medicine II (3) • CAI 5XXX AI Design Studio II (3) • Elective (3) – e.g., CAI 6XXX Applied Generative AI in Medicine	• CAI 6XXX Clinical AI Design Studio I (3)

Fall Year 2 [9 credits]	Spring Year 2	Summer Year 2
• CAI 6XXX Clinical AI Design Studio II (3) • CAI 5XXX Economic, Social, Legal and Ethical Implications of AI in Medicine (3)		

• Elective (3) – CAI 5XXX Supervised Research in AI for Health (3) **Thesis/Capstone Project** **Graduation**		

Part-time student course sequence sample [Exam option]

Fall Year 1 [4 credits]	Spring Year 1 [6 credits]	Summer Year 1 [3 credits]
• CAI 5XXX Fundamentals of AI in Medicine I (3) • CAI 5XXX AI Design Studio I (1) • CAI 5XXX Biostatistics for AI (2)	• CAI 5XXX Fundamentals of AI in Medicine II (3) • CAI 5XXX AI Design Studio II (3)	• CAI 6XXX Clinical AI Design Studio I (3)

Fall Year 2 [6 credits]	Spring Year 2 [3 credits]	Summer Year 2
• CAI 6XXX Clinical AI Design Studio II (3) • CAI 5XXX Economic, Social, Legal and Ethical Implications of AI in Medicine (3)	• Elective (3) – e.g. CAI 6XXX Applied Generative AI in Medicine (3)	

Fall Year 3 [5 credits]	Spring Year 3 [3 credits]	Summer Year 3
• Elective (3) – e.g. CAI 5XXX AI in Medical Image Analysis (3)	• Elective (3) – e.g., CAI 5XXX AI-Powered Drug Discovery (3) **Graduation**	

Part-time student course sequence sample [Thesis/Capstone project option]

Fall Year 1 [4 credits]	Spring Year 1 [6 credits]	Summer Year 1 [3 credits]

• CAI 5XXX Fundamentals of AI in Medicine I (3) • CAI 5XXX AI Design Studio I (1) • CAI 5XXX Biostatistics for AI (2)	• CAI 5XXX Fundamentals of AI in Medicine II (3) • CAI 5XXX AI Design Studio II (3)	• CAI 6XXX Clinical AI Design Studio I (3)

Fall Year 2 [6 credits]	Spring Year 2 [3 credits]	Summer Year 2
• CAI 5XXX Clinical AI Design Studio II (3) • CAI 5XXX Economic, Social, Legal and Ethical Implications of AI in Medicine (3)	• Elective (3) – e.g. CAI 6XXX Applied Generative AI in Medicine (3)	

Fall Year 3 [5 credits]	Spring Year 3 [6 credits]	Summer Year 3
• Elective (3) – e.g. CAI 5XXX AI in Medical Image Analysis (3) • Elective (3) – e.g., CAI 5XXX AI Powered Drug Discovery (3)	• Elective (3) – e.g. CAI 6XXX Supervised Research in AI for Health (3) **Thesis/Capstone project** **Graduation**	

Recommended Change to Final Defense and Exam Policy

Brief description: Change the six-month expiration timeline to three semesters, including the term in which the defense or exam is completed.

Source of proposal: Internal, Graduate School Staff

Rationale:

- As a practical matter, a three-term expiration timeline (as opposed to six months) aligns better with other academic deadlines.
- Currently, nearly all petitions to extend the validity of a defense or final exam at the six-month point are approved, creating unnecessary work for academic unit and Graduate School staff.
- A three-term expiration timeline (e.g., a student who defends a thesis or dissertation or completes a final exam any time during a spring term would be allowed the following summer and fall to meet all degree requirements) allows for fair flexibility while maintaining the academic integrity of the defense or exam as a still-current and *final* milestone.
- Cases in which a student does not complete degree requirements within an academic year (e.g., spring, summer, fall) of completion of a final defense or exam would indeed be considered exceptions requiring a petition to explain extenuating circumstances before being approved.

Proposed catalog changes:

Under "Ph.D. and Other Doctoral Degree Requirements" and "Final Exams" at https://gradcatalog.ufl.edu/graduate/degrees/

- The defense should be no more than ~~6 months~~ three semesters, including the term in which the defense is completed, before the degree is awarded. ~~and must have occurred within no more than one term in advance of that degree award.~~

Under "Master Degree Requirements" and "Thesis final examination" at https://gradcatalog.ufl.edu/graduate/degrees/

- The defense date must be fewer than ~~6 months~~ three semesters, including the term in which the defense is completed, before degree award.

Under “Master Degree Requirements” and “Non-thesis final comprehensive examination” at https://gradcatalog.ufl.edu/graduate/degrees/

- This comprehensive examination must be taken no more than ~~6 months~~ three semesters, including the term in which the exam is completed, before the degree is awarded.

Under “Specialist Degree Requirements” at https://gradcatalog.ufl.edu/graduate/degrees/

- Students are tested (no more than ~~6 months~~ three semesters, including the term in which the exam is completed, before graduation) by written and oral examination. A thesis is not required; however, each program includes a research component relevant to the intended profession. With the academic unit’s approval, coursework taken as part of the specialist program may count toward a doctoral degree.

Graduate Curriculum Committee

Minutes

May 9, 2024
Meeting Materials

Voting Conducted
via Zoom

I. Presentation and review of the Minutes from the April Meeting of the Graduate Curriculum Committee (GCC).

II. Update(s) to the Committee: The following was reviewed by the Graduate Curriculum Committee (GCC) previously. The GCC felt further follow-up and/or clarifications were necessary before the proposals could move forward to the University Curriculum Committee (UCC). Suggestions and/or follow-up required are noted below the proposals.

There are no updates to present.

III. Course Change Proposals: The following proposals are newly requested revisions to existing courses already within the current course catalog in curriculum inventory. The changes requested are listed below each of the proposals.

There are no course modifications to present.

IV. New 5XXX Course Proposal(s) (with attached syllabi): The following are newly requested course proposals. Proposed course titles and descriptions are listed below. Syllabi have been included with these new course requests, at the request of GCC Members.

HHP – Applied Physiology and Kinesiology

1. APK 5XXX *Anatomy & Physiology for Sport & Exercise Science*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/19943

   Proposal has been conditionally approved. Once revised, the proposal can be administratively approved without further review by the GCC.

DCP – Architecture

2. ARC 5XXX *Fundamentals Of Coding and Computation - Introduction to Computer Programming for Architects*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/19922

   Proposal has been conditionally approved. Once revised, the proposal can be administratively approved without further review by the GCC.

3. ARC 5XXX *Introduction to Healthcare Design*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/19918

Proposal has been conditionally approved. Once revised, the proposal can be administratively approved without further review by the GCC.

v. New Course Proposal(s) (with attached syllabi): The following are newly requested course proposals. Proposed course titles and descriptions are listed below. Syllabi have been included with these new course requests, at the request of GCC Members.

CLAS – Anthropology

1. ANG 6XXX *Cattle Cultures*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/19123

   Proposal has been conditionally approved. Once revised, the proposal can be administratively approved after further review by the Chair of the GCC.

CLAS – Animal Sciences

2. ANS 6XXX *Dairy Farm Evaluation*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/19658

   Proposal has been conditionally approved. Once revised, the proposal can be administratively approved after further review by the Chair of the GCC.

DCP – Architecture

3. ARC 6XXX *Clocks and Clouds*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/19816

   Proposal has been conditionally approved. Once revised, the proposal can be administratively approved after further review by the Chair of the GCC.

4. ARC 6XXX *Co-design Lab for Healthcare Environments*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/19813

   Proposal has been conditionally approved. Once revised, the proposal can be administratively approved after further review by the Chair of the GCC.

5. ARC 6XXX *Healthcare Design Practice*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/19810

   Proposal has been conditionally approved. Once revised, the proposal can be administratively approved without further review by the GCC.

6. ARC 6XXX *Machine Learning for Architects*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/19827

   Proposal has been conditionally approved. Once revised, the proposal can be administratively approved after further review by the Chair of the GCC.

7. ARC 6XXX *Planning and Design for Health Environments*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/19809

   Proposal has been conditionally approved. Once revised, the proposal can be administratively approved without further review by the GCC.

CLAS – Classics

8. CLA 6XXX *Classical Civilization, rotating topic*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/19455

   Proposal has been conditionally approved. Once revised, the proposal can be administratively approved without further review by the GCC.

COE – School of Special Education, School Psychology, and Early Childhood Studies

9. EEX 6XXX *Family and Teacher Perspectives on Disability*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/19041

   Proposal has been conditionally approved. Once revised, the proposal can be administratively approved without further review by the GCC.

10. EEX 7XXX *Applied Research in Special Education*
    Link to proposal: https://secure.aa.ufl.edu/Approval/reports/19040

    Proposal has been conditionally approved. Once revised, the proposal can be administratively approved without further review by the GCC.

CLAS – Political Science

11. INR XXXX *Feminist International Relations*
    Link to proposal: https://secure.aa.ufl.edu/Approval/reports/19914

    Proposal has been conditionally approved. Once revised, the proposal can be administratively approved without further review by the GCC.

CBA – Management

12. MAN 6XXX *Strategy & Disruption in Technology Industries*
    Link to proposal: https://secure.aa.ufl.edu/Approval/reports/19805

    Proposal has been conditionally approved. Once revised, the GCC wishes to review the proposal again.

HHP – Sport Management

13. PET 5XXX *Athlete Sexual Health and Wellness*
    Link to proposal: https://secure.aa.ufl.edu/Approval/reports/18351

    Proposal has been conditionally approved. Once revised, the proposal can be administratively approved after further review by the Chair of the GCC.

VI. Information Items:

1. CHM 6943 – 19930 – Change variable and maximum repeatable credit
2. DCP 6230 – 19788 – Change Course Title, Contact Type, Course Description, and Objectives
3. EGS 6949 – 19445 – Change to course description, prerequisites, and co-requisites
4. ENT 6930 – 19700 – Change maximum repeatable credit
5. FYC 7980 – 19750 – Change maximum repeatable credit
6. FYC 7979 – 19942 – Change maximum repeatable credit
7. MAR 6105 – 19811– Change prerequisites
8. MAR 6157 – 19812 – Change prerequisites
9. MAR 6237 – 19818 – Change prerequisites
10. MAR 6335 – 18919 – Change prerequisites
11. MAR 6508 – 19820 – Change prerequisites
12. MAR 6591 – 19821 – Change prerequisites
13. MAR 6667 – 19822 – Change prerequisites
14. MAR 6722 – 19823 – Change prerequisites
15. MAR 6833 – 19824 – Change prerequisites
16. MAR 6861 – 19825 – Change prerequisites
17. MAT 6932 – 19756 – Change maximum repeatable credit
18. PHC 7979 – 19850 – Change maximum repeatable credit
19. POS 6933 – 19742 – Change maximum repeatable credit
20. REE 6395 – 19732 – Change Course Title
21. SPA 6581 – 19833 – Change maximum repeatable credit
22. SPN 6735 – 19873 – Change maximum repeatable credit
23. SPM 5936 – 19837 – Change maximum repeatable credit

24. SYA 7933 – 19762 – Change maximum repeatable credit

Graduate Curriculum Committee

Agenda

June 13, 2024
Meeting Materials

Voting Conducted
via Zoom

I. Presentation and review of the Minutes from the May Meeting of the Graduate Curriculum Committee (GCC).

II. Update(s) to the Committee: The following was reviewed by the Graduate Curriculum Committee (GCC) previously. The GCC felt further follow-up and/or clarifications were necessary before the proposals could move forward to the University Curriculum Committee (UCC). Suggestions and/or follow-up required are noted below the proposals.

CBA – Management

1. ENT 6XXX *Strategy and Disruption in Technology Industries*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/19805

   GCC requested revisions to the course title, description, and objectives. The unit was also asked to clarify or correct the contact hours. The Committee requested to re-review this proposal once revised. The unit has since revised the attached submission materials, attached here.

III. Course Change Proposals: The following proposals are newly requested revisions to existing courses already within the current course catalog in the curriculum inventory. The changes requested are listed below each of the proposals.

There are no course modifications to present.

IV. New 5XXX Course Proposal(s) (with attached syllabi): The following are newly requested course proposals. Proposed course titles and descriptions are listed below. Syllabi have been included with these new course requests, at the request of GCC Members.

DCP – Architecture

1. ARC 5XXX *Graduate Architectural History 1*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/20028

   An examination of the theories and methods in which architectural history is written through social, religious, cultural, environmental, and political paradigms. The course covers movements, architects, ideas, empires, and discourses that produced architecture until 1400 CE. This is the first part of the architectural history survey for architecture students. 3-credits.

2. ARC 5XXX *Graduate Architectural History 2*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/20007

   A history of architecture and urbanism from 1400 to 1850. Students analyze formal, spatial, structural, and environmental principles grounded in architecture movements, discourses, social, political, material, technological, cultural forces, seen in synchronous developments of global architecture and urbanism. The second of the architectural history surveys for architecture students. 3-credits.

3. ARC 5XXX *Graduate Core Studio 1*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/20005

   Project-based introduction to fundamental design techniques, including design theory, three-dimensional development, and spatial relationships with an emphasis on hybrid digital/analog methods. Design issues, including scale, measure, materiality, cultural history, methodology, program and mapping are explored within activities and discussion of context, architectural language and issues of representation. 6 credit hours.

4. ARC 5XXX *Graduate Core Studio 2*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/20012

   Project-based continuation of fundamental design issues, including scale, measure, movement, edges, boundaries, and materiality. Analysis of context, cultural history, mapping, architectural language, and issues of representation are applied by students in a constructed synthesis of program, space, tectonics, and occupation. Hybrid digital/analog prototyping methods of fabrication and modeling. 6 credit hours.

5. ARC 5XXX *IPAL Seminar 1*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/20025

   Architects and their Collaborators – IPAL (Integrated Path to Architecture Licensure) 1 is an introduction to professional practice. Students visit architecture firms, engineering consultants, and integrated product suppliers (lighting, furnishing, similar). Firm leaders give a brief presentation, to show types of work, philosophy, office organization, hierarchy, operation – and engage in open discussion. Students tour the offices are introduced to staff. 1 credit hour.

6. ARC 5XXX *IPAL Seminar 2*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/20026

   The Construction Site – IPAL (Integrated Path to Architecture Licensure) 2 is an introduction to the Construction Administration role of the architect. Students visit construction sites with project team members present; owner, architect, building contractor, and subcontractors. Students learn Division 1 – General Conditions of Construction, jobsite safety, construction observation, leadership and collaboration during construction. 1 credit hour.

7. ARC 5XXX *IPAL Seminar 3*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/20027

   Preparing for Licensure– IPAL (Integrated Path to Architecture Licensure) 3 introduces the Architecture Registration Exam (ARE), and Architectural Experience Program (AXP) strategy, tools, study group formation. 1 credit hour.

v. New Course Proposal(s) (with attached syllabi): The following are newly requested course proposals. Proposed course titles and descriptions are listed below. Syllabi have been included with these new course requests, at the request of GCC Members.

MED – General Medicine

1. CAI 5XXX *AI Design Studio I*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/19998

   This experiential seminar course will feature numerous faculty experts from diverse backgrounds who will guide students through more than a dozen unique real-world examples of machine learning for healthcare applications. Students will gain valuable experience in designing, developing, and deploying AI systems using contemporary tools, models, and platforms.

2. CAI 5XXX *AI Design Studio II*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/19999

   AI Design Studio II is an experiential applied research course in which each student will propose a self-directed clinical AI research project that addresses a real-world healthcare challenge and spend the full semester building and testing their AI system. Students will be supervised by an AI faculty member as they organize, develop, evaluate, and refine their approach. This course follows the guided experiential learning and high-level overview of the clinical AI landscape presented in AI Desi

3. CAI 5XXX *AI for Clinical Decision Support*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/20020

   Students will explore the current landscape of clinical artificial intelligence (AI) for augmenting patient care, including real-world deployments, promising cutting-edge research, and ethical and societal implications of current clinical AI progress. A hybrid flipped classroom/journal club structure which emphasizes peer engagement will empower students to join the ongoing conversation and become versed in the contemporary clinical AI topics that are currently shaping the field.

4. CAI 5XXX *AI in Medical Image Analysis*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/20018

   Medical imaging, technologies that visualize the interior of the human body, has become an increasingly important tool for the early diagnosis, prognosis, and treatment of various diseases. This course will focus on recent advances in artificial intelligence for medical image analysis, including: Basics of medical imaging, Image visualization, Convolutional neural networks, Image classification, Image segmentation, Transformer networks, Image registration, Generative adversarial networks.

5. CAI 5XXX *AI-Powered Drug Discovery*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/20022

   AI-Powered Drug Discovery explores the cutting-edge application of Artificial Intelligence (AI) in discovering novel compounds to be used as therapeutics. We will delve into the fundamental principles of machine learning and deep learning techniques used for virtual screening, lead optimization, and de novo molecule design. The course will also address the integration of biological data with AI models and explore the practical challenges and limitations of this approach.

6. CAI 5XXX *Biostatistics for AI*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/20019

   Biostatistics for AI highlights the crucial role of biostatistics in AI-driven medical applications. Students will master foundational biostatistical methods, design effective medical experiments, and navigate the intricacies of large biomedical datasets. Emphasizing the union of traditional biostatistics with contemporary AI techniques, the course ensures proficiency in data analysis, AI model validation, and addressing ethical challenges in medical data use.

7. CAI 5XXX *Economic, Social, Legal, and Ethical Implications of AI in Medicine*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/19995

   This graduate-level course provides an in-depth exploration of the intersection between Artificial Intelligence (AI) and society, with a focus on alignment, ethics, economic implications, and legal policy. Students will: analyze the ethical dilemmas arising from AI technologies; analyze potential economic disruptions and identify strategies for inclusive growth and equitable distribution of AI-generated benefits; consider legal frameworks for aligning AI

8. CAI 5XXX *Fundamentals of Artificial Intelligence in Medicine I*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/19996

This course introduces the fundamental concepts of Artificial Intelligence and Machine Learning (AI/ML) with a focus on applications in the medical field. It covers foundational AI/ML concepts, diverse medical data sources, and the complete lifecycle of AI/ML in healthcare, complemented by insights into model evaluation and ethical considerations. The course offers a mix of lectures, hands-on labs, and project work, emphasizing practical application in real-world scenarios.

9. CAI 5XXX *Fundamentals of Artificial Intelligence in Medicine II*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/19997

   Building on the foundational concepts introduced in Fundamentals of Artificial Intelligence in Medicine I, this course explores deeper into Artificial Intelligence (AI), with a specific focus on deep learning and its applications in the field of medicine. Students will learn more advanced deep learning architectures, including convolutional neural networks (CNNs), recurrent neural networks (RNNs), and transformers.

10. CAI 6XXX *Applied Generative AI in Medicine*
    Link to proposal: https://secure.aa.ufl.edu/Approval/reports/20023

    This course provides a comprehensive overview of generative artificial intelligence (AI) and its applications in healthcare. Students will learn the fundamentals of generative models, including Generative Adversarial Networks (GANs), Variational Autoencoders (VAEs), and Diffusion Models.

11. CAI 6XXX *Clinical AI Design Studio I*
    Link to proposal: https://secure.aa.ufl.edu/Approval/reports/20000

    Clinical AI Design Studio I offers an immersive learning experience for students interested in the intersection of artificial intelligence (AI) and clinical practice. Throughout the semester, students will participate in rotations, spending time working in various faculty members' labs or clinical domains.

12. CAI 6XXX *Clinical AI Design Studio II*
    Link to proposal: https://secure.aa.ufl.edu/Approval/reports/20017

    Clinical AI Design Studio II offers a unique, extended engagement with a faculty advisor, building upon the foundational experiences from Clinical AI Design Studio I. Students will delve into the specialized clinical domain of their advisor, gaining firsthand insights into the intricacies of patient care and medical decision-making processes.

13. CAI 6XXX *Supervised Research in AI for Health*
    Link to proposal: https://secure.aa.ufl.edu/Approval/reports/20021

Students will work with their technical and clinical advisors to design, develop, and complete an agreed-upon substantive project. Students may take this course in order to advance their research interests, to complete a capstone project, or to complete a Master's Thesis.

DCP – Design, Construction and Planning

14. DCP 6XXX *Green Building Strategies*
    Link to proposal: https://secure.aa.ufl.edu/Approval/reports/19963

    This is an interactive multidisciplinary course, in which students are introduced to green strategies and technologies for the design, construction and operation of high-performance buildings. The course is designed to equip students with the skills and knowledge needed to be effective communicators, critical thinkers, project managers, problem solvers, and team players. Students learn the Department of Energy Zero Design and prepare to earn LEED credentials.

JOU – Mass Communication

15. MMC 6XXX *Computational Methods for Media Research*
    Link to proposal: https://secure.aa.ufl.edu/Approval/reports/20038

    Computational methods for media research is an introductory and project-oriented course with an emphasis on data collection and computational methods. Students learn how to conduct social research using digital trace data (broadly defined as data collected through digital means) and computational methods (including but not limited to text analysis and social network analysis). Includes hands-on practice.

16. MMC 6XXX *Human Machine Communication*
    Link to proposal: https://secure.aa.ufl.edu/Approval/reports/20032

    Human-machine communication is an area of study that investigates the creation of meanings among humans and machines. It involves communication with digital interlocutors including embodied machine communicators, virtual/artificially intelligent agents, and technologically augmented persons, either in real or augmented environments.

VI. Information Items:

1. LAS 6938 – 19923 – Change maximum repeatable credit from 9 to 18
2. PHC 6937 – 20016 – Change maximum repeatable credit from 6 to 12
3. URP 6979 – 19931 – Change credits from Non-repeatable to Repeatable (max 12)