



**University of Florida
Ph.D. Microbiology and Cell Science
CIP 26.0503**

Document included:

Request to Offer a College-Credit Self-Supporting Program as Part of an Existing Approved Program



State University System of Florida Board of Governors
**REQUEST TO OFFER A COLLEGE-CREDIT SELF-SUPPORTING OR MARKET TUITION RATE
EDUCATION COURSE OR PROGRAM WHEN OFFERED AS PART OF AN EXISTING
APPROVED PROGRAM (SHORT FORM)**

In accordance with Board of Governors Regulations 8.011 & 8.002
(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 Agricultural and Life Science
Name of College(s) or School(s)

Microbiology and Cell Science
Name of Department(s)/Division(s)

Microbial and Cellular Data Science
Academic Specialty or Field

Ph.D.
Complete Name of Degree

26.0503
Proposed CIP Code (2020 CIP)

Proposed Program Type
 Market Tuition Rate Program
 Online
 Continuing Education
 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.

June 13, 2024
**Date Approved by the University
Board of Trustees**

 5/7/24
President's Signature Date

 6/13/24
**Board of Trustees Chair's
Signature Date**

 3/13/2024 | 11:44 AM EDT
Provost's Signature Date

Projected Enrollments

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.

Implementation Timeframe	HC	FTE
Year 1	5	2.5
Year 2	10	5
Year 3	15	7.5
Year 4	20	10
Year 5	25	12.5

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 the following.

The PhD in Microbiology and Cell Science with a concentration in Microbial and Cellular Data Science will operate as an 18-credit concentration within the current Ph.D. program in Microbiology and Cell Science. A master's degree in a life science discipline (biology, microbiology, genetics, biochemistry, etc.) will be required for admission to this PhD concentration. The ideal applicant to this program will be a successful graduate of the online Master of Science in Microbiology and Cell Science (MCS) with concentration in Medical Microbiology and Biochemistry or the Online MS in MCS with concentration in Microbiome in Health and Disease. Students with a completed master's degree in life science from other programs or institutions will also be considered. Ultimately, this program will serve a heretofore unsupported segment of online degree completers in the life sciences who are interesting in completing a PhD but unable to attend a residential doctoral program.

Assuming admitted students transfer in 30 credits from the Online MS in MCS or from a master's degree completed at an outside accredited institution, 60 credits will be required to complete the online PhD degree concentration. Of those 60 credits, 30 credits of required coursework are listed below: The coursework requirements for the Concentration in Microbial and Cellular Data Science will include a minimum of 18 credits in the following:

Concentration Core Courses (14 credits):		
Course no.	Course title	Credits
BSC 6438	R for Functional Genomics	3
BSC 6459	Fundamentals of Bioinformatics	3
MCB 6937	Python Programming	3
MCB 6796	Analysis, Interpretation, & Visualization of Micro. Data	3
MCB 6318	Comparative Microbial Genomics	2
Elective Courses: (at least 4 credits)		
MCB 6670C	The Microbiome	3
MCB 6937	AI in Agriculture and Life Sciences	3
MCB 6937	Synthetic Biology	3
MCB 6095	Careers in Microbiology and Cell Science	1
MCB 6096	Innovation Project Management for Life Sciences	1

Most of the graduate level courses taught by the UF MCS department would be available as optional elective credit, however, those courses would need to be completed in addition to the above concentration electives. Optional elective credits would require faculty advisor approval.

Journal and Seminar Requirement (at least 6 credits of each):		
MCB 7922	Journal Colloquy: Microbial & Cellular Data Science	6
MCB 6930	Seminar	6

Please note that all students in the MCS PhD programs are expected to take journal colloquies and seminars each semester in the fall and spring. These courses are not concentration specific. Only the Journal Colloquy will be synchronous (but also online). Beyond these required courses, the number of Supervised and Advanced Research credits will vary depending on the needs of the student and the requirements of the graduate school.

Research will be guided by departmental faculty advisors. Students in the online program will have the opportunity to interview potential faculty advisors during the admissions process. Once a match has been made, the student will be assigned a faculty advisor by the department at the beginning of their first term. Virtual communication by video, email, and phone will be frequent, probably every business day. The faculty advisor will formally assess the PhD student's progress after each academic term. If after the end of the first year either the student or faculty is dissatisfied with the match, a new advisor will be appointed. A graduate committee will be appointed for each student after 30 of the 60 credits required are completed. At that point, a student is expected to form a dissertation committee. From that point, overall research productivity will be assessed by the graduate committee each academic year. A large part of that assessment will be research publications in the peer-reviewed literature.

We assume most (if not all) students in the MCS PhD with concentration in Microbial and Cellular Data Science will be working full-time throughout their degree. As such, these students will most likely be completing between 3 and 6 credits per semester with some variation depending on their availability. Assuming these students pass qualifying exams on their first attempt and produce an appropriate amount of research, we anticipate time to degree would be between 4-6 years, which is similar to face-to-face PhD cohorts at UF MCS.

The PhD experience will be similar for all students, both on-campus and online, with the exception that the online students will be doing their dissertation work remotely. Access to faculty mentors will be similar but will be done virtually for online students. The department will establish a peer-mentoring system for our online students which will include formal meetings twice per term but will be free to meet informally at their discretion. An online orientation which includes a full guide of department resources and a link to the student handbook will be provided to the students and available asynchronously.

Drs. Jennifer Drew (MCS) and Sebastian Galindo (Agricultural Education and Communication Dept.) will work together on the evaluation of this program and publish the results as we have done with the MCS online BS degree program and in progress for the online MCS MS with concentration in Medical Microbiology and Biochemistry. The activities below are approved under IRB201601296. The evaluation will include a comparison with standard on-campus Ph.D. program and an evaluation of: 1) retention, 2) time and progress to degree, 3) program enrollment over time, 4) number of faculty advisors involved, 5) number of credits taken by term on average per student and overall across all students, 6) tracking of standard milestones toward degree such as the timing and success of qualifying exams, 7) participation of the students in meetings, seminars, and symposia will be tracked, 8) tracking of graduate student committee establishment and meetings, and 9) conducting separate focus groups for current students and faculty advisors in an anonymous manner. Evaluation of data from these activities will be reviewed every two years by our online Ph.D. committee to implement new policies and procedures that improve student 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)

Note, the program is listed here as a program of strategic emphasis based on the list provided by the BOG that is active through the 2023-24 academic year, but the program is no longer listed effective 2024-25.

Does not qualify as a Program of Strategic Emphasis.

Indicate if the program qualifies for the Programs of Strategic Emphasis Waiver.

- Yes
- No

If yes, the provost or their designee should contact Board staff to discuss prior to requesting any changes to the program.

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

C. If the program qualifies as a Program of Strategic Emphasis, provide a justification for charging higher tuition for this program.

Not applicable – as the program will be charging the same tuition for in-state students and a lower out-of-state tuition for out-of-state students.

Institutional and State-Level Accountability

II. Need and Demand

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

Scientific and technological advances within the life sciences have enabled the generation of very large datasets that must be processed, stored, and managed computationally (Sun et al., 2022). Researchers increasingly require data science skills to work with these datasets at scale in order to convert information into actionable insights. Because this significant rise in sequencing output has not been accompanied by a proportional increase in computational resources, whether in terms of available processing capacity or data integration, many microbiome sequences are used only once, with limited potential for data reuse beyond the

original study. (Kyrpides et al., 2016). Microbiologists in more data driven specializations are needed to analyze these vast repositories of data. Data science empowers microbiologists to engage with massive amounts of data available in the field, and enables them to:

1. Analyze and interpret this data effectively, extracting valuable insights about microbial behavior, interactions, and characteristics.
2. Identify patterns and correlations within microbiological data that may not be immediately apparent to researchers. This capability aids in the discovery of microbial trends, associations, and potential causative factors, leading to deeper understanding and more accurate predictions.
3. Develop predictive models for microbial behavior, disease outbreaks, antibiotic resistance, and other critical factors. These models enhance decision-making processes in areas such as public health interventions, clinical treatment strategies, and environmental management.
4. Contribute to advancements in microbiological research by enabling the integration of multi-omics data (genomics, transcriptomics, proteomics, etc.) and facilitating systems biology approaches. These interdisciplinary approaches help unravel complex microbial interactions, host-microbe relationships, and mechanisms of microbial pathogenesis.
5. Use bioinformatics tools and algorithms to assist in genome annotation, comparative genomics, metagenomics, and phylogenetic analysis, among other applications relevant to microbiology.

Academic Outlook

For the purposes of this analysis, we used four Classification for Instructional Program (CIP) codes including 26.0502, 26.0503, 26.0508, and 26.0599.

- Microbiology General (26.0502)
 - 2018-2022 (5-year) doctoral completions showed compound annual growth rate (CAGR) of 3.8% (from 201 to 233). The number of institutions offering programs has changed very little, from 54 to 55. The number of online programs increased from 0 to 1. Programs with the largest number of conferrals were Cal Berkely, Michigan State, Alabama at Birmingham, Vanderbilt, Georgia, and Colorado state (with 14, 12, 12, 11, 10, and 10 respectively).
- Medical Microbiology and Bacteriology (26.0503)
 - 2018-2022 (5-year) doctoral completions showed compound annual growth rate (CAGR) of minus 6.1%(from 131 to 102). The number of institutions offering programs has declined, from 37 to 30. There are not currently any online programs in this space. Programs with the largest number of conferrals were North Carolina, Virginia, Tennessee, Montana State, and Florida (with 13, 12, 9, 8, and 8 respectively).
- Microbiology and Immunology (26.0508)
 - 2018-2022 (5-year) doctoral completions showed compound annual growth rate (CAGR) of 6.1% (from 75 to 95). The number of institutions offering programs has changed very little, from 19 to 23. There are currently zero online programs. Programs with the largest number of conferrals were Pittsburgh, Wisconsin, Minnesota, Drexel, and Michigan (with 11, 10, 8, 7, and 7 respectively).
- Microbiological Sciences and Immunology, other (26.0599)
 - 2018-2022 (5-year) doctoral completions showed compound annual growth rate (CAGR) of minus 6.1% (from 58 to 45). The number of institutions offering programs has declined, from 15 to 13. There are currently zero online programs. Programs with the largest number of conferrals were Dartmouth, Washington University of St. Louis, Washington, and Rutgers (with 19, 12, 5, and 4 respectively).

Figure 1. HDR Growth Categories for CIP Codes Related to Microbiology & Cell Science

Program	Overall Growth Category	Student Demand	Labor Demand
'26.0502 - Microbiology, General.	Mixed	Emerging	High Growth
'26.0503 - Medical Microbiology and Bacteriology.	Mixed	Low Growth	High Growth
'26.0508 - Microbiology and Immunology.	Mixed	Emerging	High Growth
'26.0599 - Microbiological Sciences and Immunology, Other.	Mixed	Low Growth	Emerging

Lightcast Market Analysis Software (LMAS) shows that cumulatively, across all four CIP Codes, the number of completions has stayed relatively the same from 2018-2022 (464 to 475) for a CAGR of 0.47%. The total number of programs has decreased from 94 to 93 in the same period. In 2018, no programs were available online, and in 2022 there is only one available. Figure 2 provides a complete breakdown of enrollment trends since 2003.

Table 1. Completions by Institution in 2022 – Top 10 institutions by Market Share for Microbiology Programs

Institution	Doctoral Completions 2022	Growth % YOY 2022	Market Share 2022	IPEDS Tuition & Fees 2022 In-state	IPEDS Tuition & Fees 2022 Out of State
Dartmouth College	19	90.00%	4.00%	\$8,092	\$8,092
Univ. of Pittsburgh	15	-11.80%	3.20%	\$1,003	\$1,728
Univ. of California-Berkeley	14	75.00%	2.90%	N/A	N/A
Univ. of North Carolina	13	62.50%	2.70%	\$586	\$1,602
Univ. of Alabama Birmingham	12	-7.70%	2.50%	\$468	\$1,109
Michigan State Univ.	12	71.40%	2.50%	\$842	\$1,654
Washington Univ. in St Louis	12	50.00%	2.50%	\$2,476	\$2,476
Univ. of Virginia	12	50.00%	2.50%	\$827	\$1,394
Vanderbilt Univ.	11	120.00%	2.30%	\$2,215	\$2,215
Colorado State Univ.	10	42.90%	2.10%	\$602	\$1,476
Univ. of Georgia	10	-44.40%	2.10%	\$370	\$1,050
Columbia Univ.	10	42.90%	2.10%	\$2,178	\$2,178
Medical College of Wisconsin	10	150.00%	2.10%	\$1,250	\$1,250

Example Similar Programs – note these may not all be in the CIP codes above.

Oregon State University

<https://microbiology.oregonstate.edu/research/microbial-informatics-data-science>

Microbial Informatics and Data Science

University of Washington

<https://www.biology.washington.edu/programs/graduate/advanced-data-science-phd-option>

PhD in Biology with Data Science Options

University of Delaware

<https://bioinformatics.udel.edu/education/degrees/binf-phd/>

PhD in Bioinformatics Data Science

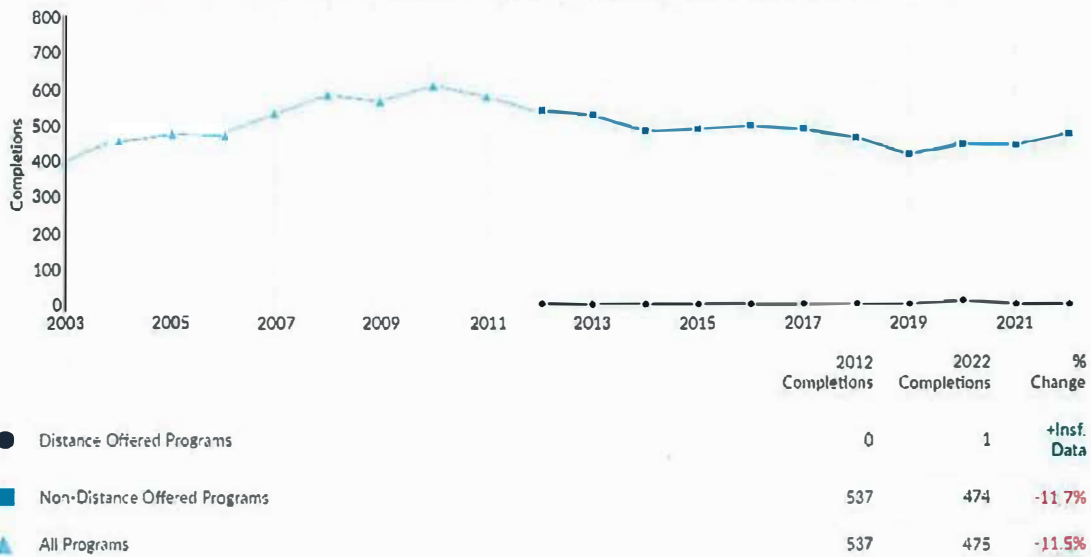
University of Wisconsin
<https://biostat.wiscweb.wisc.edu/education/current-students/phd-bds/>
 PhD in Biomedical Data Science

Stanford
<https://bulletin.stanford.edu/programs/BMDS-PHD>
 PhD in Biomedical Data Science

Clemson
<https://www.cs.clemson.edu/bdsi/>
 PhD In Biomedical Data Science and Informatics

Washington University in St. Louis
<https://dbbs.wustl.edu/programs/biomedical-informatics-data-science/>
 PhD in Biomedical Informatics & Data Science

Figure 2. Completion Trends for Microbiology PhD Completions 2003-2022.



Occupation Data

LMAS identified seven broad occupational categories from occupation-academic program crosswalks that would be most likely to pursue a doctoral degree in microbiology (see Table 2). The demand for these jobs is expected to grow by 14.3% over the next 10 years and report having 41,174 average annual job openings. Further, LMAS reports over 91,000 employees working in this sector with at least a master's degree, and another 135,000 with a bachelor's degree, which suggests that there is a large audience that may be interested in upskilling in this area. These data do not include the large number of bachelor's and master's degree holders in adjacent disciplines like biology, biochemistry, and genetics. One thing to consider though is that, from a competition perspective, there are over several thousand similar doctoral degrees awarded annually and these students in adjacent disciplines including biomedical sciences, biological sciences, biochemistry, and microbiology among many others that would also be competitive for these positions.

Table 2. Target Occupations Filtered for Microbiology Program CIP Codes

Occupation	2021 Jobs	Avg. Annual Openings	Growth 2021-31	Entry Level
Postsecondary (Biological & Health) Teachers	325,200	33,000	14.32%	D/P
Medical Scientists, Except Epidemiologists	60,503	4,285	15.95%	D/P
Natural Sciences Managers*	18,532	1,578	10.91%	B
Biological Scientists, All Other	14,120	1,236	10.32%	B
Microbiologists	5,043	443	10.05%	B
Biological Technicians	4,279	608	11.31%	B
Food Science Technicians	155	24	9.68%	A

*Experience typically required

Job Data

Keyword search (Microbiology OR Microbiome OR microbial OR Cell science) AND “Data Science” and a filter for doctoral degrees. There were 832 available jobs in calendar year 2023 compared to 161 postings in calendar year 2018. When you drop the “data science” search term, there were 10,787 jobs in calendar year 2018 for microbiology positions with a PhD and 15,009 in calendar year 2023. So, there has been pretty strong growth for microbiology PhD’s overall, but significant growth for people with both microbiology and data science skills. Further, the average salary for the job postings seeking microbiology and data science skills was much higher, with a median salary in 2023 of 118.1 thousand compared to 94.5 thousand without the data science skills. Given that, employers are putting a premium on having the two skills together. The top jobs over the past five years are listed in Table 3.

Table 3. Unique Job Postings for Occupations related to Microbiology & Data Science December 2018 – 2023 Filtered by Relevant Search Terms and Requiring/Preferring a PhD

Job Title	Postings
Computational Biologists	109
Bioinformatics Scientists	104
Data Scientists	98
Nuclear Chemistry Technicians	93
Postdoctoral Fellows	83
Organizational Managers	75
Biological Scientists	47
Bioinformaticians	45
Scientists	43
Computational Scientists	42
Modeling Analysts	40
Science and Technology Directors	36
Principal Scientists	32
Bioinformatics Analysts	31
Research Scientists	30
Assistant/Associate/Full Professors	24
Postdoctoral Associates	23
Insights Analysts	21
Professors of Microbiology	21
Statistical Geneticists	21

LMAS also allows us to examine in-demand skills for these job postings. Tables 3 and 4 provides insight into the supply and demand of relevant skills by comparing the frequency of skills present in job postings against skills present in today's workforce. Ideally, the curriculum of the degree programs aligns with the skills that are most in-demand in the workforce. Upon request, we can drill down further into these skills by specific job or occupation.

Table 3. Specialized Skills for Microbiology & Data Science Jobs filtered by Relevant Search Terms and Requiring/Preferring a PhD

Skill	% of postings	Projected skill growth
Data Science	77%	Growing
Biology	58%	Rapidly Growing
Microbiology	46%	Growing
Data Analysis	39%	Rapidly Growing
Bioinformatics	35%	Stable
Python (Programming Language)	29%	Rapidly Growing
Machine Learning	28%	Growing
Genomics	27%	Growing
R (Programming Language)	27%	Rapidly Growing
Computational Biology	27%	Stable
Computer Science	27%	Rapidly Growing
Chemistry	22%	Growing
Molecular Biology	20%	Growing
Biochemistry	19%	Growing
Genetics	17%	Stable
Workflow Management	16%	Growing
Artificial Intelligence	15%	Growing
Immunology	15%	Growing
Biostatistics	14%	Growing
Project Management	12%	Growing

Table 4. Specialized Skills for Microbiology Jobs filtered by Relevant Search Terms and Requiring/Preferring a PhD (leaving out Data Science as a key search term)

Skill	% of postings	Projected skill growth
Microbiology	66%	Growing
Biology	50%	Rapidly Growing
Molecular Biology	29%	Growing
Biochemistry	28%	Growing
Immunology	24%	Growing
Chemistry	21%	Growing
Data Analysis	17%	Rapidly Growing
Biochemical Assays	15%	Growing
Cell Biology	14%	Growing
Genetics	13%	Stable
Infectious Diseases	12%	Growing
Biotechnology	11%	Growing
Pharmaceuticals	11%	Growing
Project Management	11%	Growing
Good Manufacturing Practices	10%	Growing
Virology	10%	Growing
Cell Cultures	9%	Growing

Genomics	9%	Growing
Bioinformatics	9%	Stable
New Product Development	9%	Rapidly Growing

In summary, there appears to be significant demand in the workforce for microbiology related PhDs, with over 15,000 job postings in 2023 compared to only 475 doctoral completions. While there are similar doctoral completions in biochemistry, genetics, biology, and the biomedical sciences, the total number of PhD's awarded annually even in adjacent disciplines was still just above 3,000 in 2022. This suggests that there are more jobs available than there are working professionals with the qualifications to fill them. Several popular and peer-reviewed articles have also been published that suggest a large shortage of microbiologists. One study suggests that 80% of microbiology laboratories have vacant positions (Leber et al., 2023). Given that, in addition to the growing demand for data science in microbiology, the noted gap of data scientists with microbiology skills, and finally the limited number of microbiology/data science doctoral training, we believe this program is entering the market at an ideal time. Further, the fact that so few degrees in this space are available online provides a huge competitive advantage, as working professionals who wish to require the relevant training in microbial data science will not have to stop working to complete their PhD. In addition, the price point looks to be much cheaper than other programs, which is critical as most students will not receive stipends and tuition waivers, and finally, given the huge number of graduates from the online MS at UF Microbiology, there is already an audience interested in the program. In sum, the data suggests that the program should be able to successfully maintain self-supporting status.

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.

Not applicable. All linkages were in the CIP-SOC crosswalk.

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.

Table 5. Labor Market Demand, All CIP Codes in Analysis

Occupations	Percent Change in Job Openings		Annual Average Job Openings		Total # of New Jobs		Education Level Needed for Entry
	FL 2023-33	U.S. 2023-33	FL 2023-33	U.S. 2023-33	FL 2023-33	U.S. 2023-33	
25-1071 Health Specialties Teachers, Postsecondary	20%	19%	1146	27400	2191	50200	Doctoral
25-1042 Biological science teachers, postsecondary	5%	4%	874	20900	310	7100	Doctoral

Medical Scientists, Except Epidemiologists	17%	11%	281	7,698	654	9,855	Bachelors
Natural Sciences Managers*	7%	10%	295	5,517	262	6,504	Bachelors
Biological Scientists, All Other	8%	10%	368	1,976	360	2,264	Bachelors
Microbiologists	15%	11%	47	11,919	75	9,500	Bachelors
Biological Technicians	12%	9%	402	2,631	348	1,602	Bachelors
Food Science Technicians	7%	11%	84	7,698	41	9,855	Associates

Sources: LMAS and USBLS 1/31/2024

III. Self-Supporting and Market Tuition Rate Programs

A. Provide supporting documentation in a separate attachment that serves as evidence that the proposed 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.

There will not initially be an E&G equivalent for the concentration in Microbial and Cellular Data Science. The program is intended for a much different audience than the existing E&G PhD program in Microbiology and Cell Science (without concentration). We do anticipate that the addition of the self-supporting doctoral concentration to the microbiology portfolio will bring additional attention and visibility to the E&G PhD, which we believe will result in more competitive applicants to the program. Over time, if E&G students are interested, the concentration can be formally made available to on-campus E&G students. All the courses are available to any graduate student in the program at any time as an elective, either E&G or self-supporting. Table 6 below demonstrates how the existence of the self-supporting online MS in microbiology and cell science has not negatively impacted either of the E&G graduate options in the department, and in fact, has been associated with increased enrollment in the PhD program.

Table 6. Enrollment in E&G and Self-Supporting Programs in the Department of Microbiology and Cell Science 2015 - 2023

Year	PhD	Campus MS	Online MS
2015	49	2	32
2016	57	1	170
2017	64	1	244
2018	60	6	338
2019	63	6	379
2020	61	7	636
2021	58	5	937
2022	63	2	904
2023	68	2	844

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.

Table 7. Tuition and Fee Comparison between E&G and Self-Supporting Programs within a Similar CIP Code

E&G Track or Program	Proposed Program
In-state Tuition – \$448.73	In-state Tuition – \$448.73
Out-of-state Tuition – \$448.73	Out-of-state Tuition – \$600.00
Non-resident Fee – \$690.21	
Non-resident SFA - \$34.51	
Capital Improvement Trust Fund – \$6.76	Capital Improvement Trust Fund – \$6.76
Student financial aid – \$22.43	Student financial aid – \$22.43
Technology Fee – \$6.56	Technology Fee – \$6.56
Activity and Service Fee - \$19.06	
Athletic Fee - \$1.90	
Health Fee - \$15.81	
Transportation Access – \$9.44	
In-state Total - \$530.69	In-state Total - \$484.48
Out-of-state Total – \$1,255.41	Out-of-state Total – \$635.75
All amounts per credit	All amounts per credit

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.

Not applicable

IV. Estimate of Investment

Use Appendix A – Table 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.

V. 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.

Required Appendices by Degree Level I

Appendix	Appendix Title	Supplemental Instructions	Included Yes/No	Required for Degree Program Level		
				Bachelors	Masters/ Specialist	Doctoral/ Professional
A	Tables 1B & 3B	Complete only tables 1B & 3B of the file	Yes		X	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	n/a		X	X
H	Attestations for Self-Supporting and Market Tuition Rate Programs	Required only for self-supporting or market tuition rate programs	Yes		X	X

Additional Appendices

Appendix	Appendix Title	Description
A	Budget and Headcount Projections	Table 1b and 3b
H	Attestation for Self-supporting status	

References

Kyrpides, N. C., Eloe-Fadrosh, E. A., & Ivanova, N. N. (2016). Microbiome data science: understanding our microbial planet. *Trends in microbiology*, 24(6), 425-427.

Leber, A. L., Peterson, E., & Dien Bard, J. (2022). The hidden crisis in the times of COVID-19: critical shortages of medical laboratory professionals in clinical microbiology. *Journal of clinical microbiology*, 60(8), e00241-22.

Sun, E., König, S. G., Cirstea, M., Hallam, S. J., Graves, M. L., & Oliver, D. C. (2022). Development of a data science CURE in microbiology using publicly available microbiome datasets. *Frontiers in Microbiology*, 13, 1018237.

**APPENDIX A
TABLE 1-B
PROJECTED HEADCOUNT FROM POTENTIAL SOURCES
(Graduate Degree Program)**

Source of Students (Non-duplicated headcount in any given year)*	Year 1 HC	Year 1 FTE	Year 2 HC	Year 2 FTE	Year 3 HC	Year 3 FTE	Year 4 HC	Year 4 FTE	Year 5 HC	Year 5 FTE
Individuals drawn from agencies/industries in your service area (e.g., older returning students)	0	0	0	0	0	0	0	0	0	0
Students who transfer from other graduate programs within the university**	0	0	0	0	0	0	0	0	0	0
Individuals who have recently graduated from preceding degree programs at this university	3	1.5	6	3	0	4.5	12	6	15	7.5
Individuals who graduated from preceding degree programs at other Florida public universities	0	0	0	0	0	0	0	0	0	0
Individuals who graduated from preceding degree programs at non-public Florida institutions	0	0	0	0	0	0	0	0	0	0
Additional in-state residents***	0	0	0	0	0	0	0	0	0	0
Additional out-of-state residents***	2	1	4	2	6	3	8	4	10	5
Additional foreign residents***	0	0	0	0	0	0	0	0	0	0
Other (Explain)***	0	0	0	0	0	0	0	0	0	0
Totals	5	2.5	10	5	15	7.5	20	10	25	12.5

* List projected annual headcount of students enrolled in the degree program. List projected yearly cumulative ENROLLMENTS instead of admissions.

** If numbers appear in this category, they should go DOWN in later years.

*** Do not include individuals counted in any PRIOR category in a given COLUMN.

**APPENDIX A
TABLE 3B
CONTINUING EDUCATION, SELF-SUPPORTING
AND MARKET RATE PROGRAM BUDGET**

Institutions may edit the table below as applicable to their specific program and circumstances. The general headings (in bold) should serve as a guide, but institutions may edit the information below the headings as needed or desired. Detailed definitions are located at the bottom of the table. The Description or Explanation column is optional and should not replace the narratives required in the new degree program proposal.

Category	Year 4	Year 5	Description or Explanation - If Needed
Tuition	In-state		
Program Tuition (Full Cost to the Student)	\$6,292.38	\$6,292.38	We anticipate students will be half time, so roughly 12 credits per year
Program Tuition (Per Credit Hour)	\$524.37	\$524.37	In-state 448.73, out-of-state 600, anticipating 50-50 IS vs OOS. So average tuition per credit hour is $(600+448.73)/2 = 524.37$
Headcount	5.00	25.00	
Total Tuition Revenue	\$31,481.90	\$157,309.50	
Faculty Salaries and Benefits			
Faculty Salaries	\$10,836.80	\$54,184.00	Committee members will be paid a lump sum of \$400 per year per student. Faculty who teach lecture courses to these students will also be paid \$40/SCH. At 5 students in year 1; 4 committee members, x 400 per member, + 5 students x 12 credits x 40/SCH = year 1 amount. Overload payments will also include a 2% fringe for additional pay.
Program Director/Department Chair	\$0.00	\$0.00	
Total Faculty Salaries	10,837	54,184	
Staff and Administrative Support			
USPS Staff	\$0.00	\$0.00	
A&P Staff	\$0.00	\$0.00	
OPS Staff	\$1,375.44	\$6,877.20	Our departmental Ph.D. advisor will be paid overload \$10 per student credit hour plus 4.2% fringe for additional pay. - Department marketing costs of \$12 per SCH overload payments to marketing specialist +4.2% fringe for additional pay.
Assistantships and Fellowships	\$0.00	\$0.00	
Total Staff and Administrative Support Costs	\$ 1,375.44	\$ 6,877.20	
Programmatic Expenses			
Equipment - Purchase and Servicing	\$0.00	\$0.00	
Materials and Supplies	\$0.00	\$0.00	
Other Programmatic Expenses - Please Explain	\$3,148.19	\$15,730.95	10% reinvestment into advertising
Total Programmatic Expenses	\$ 3,148.19	\$ 15,730.95	

Overhead Costs			
<i>See definitions below</i>	\$ 4,682.03	\$ 23,410.17	Overhead assessment
Total Overhead Costs	\$ 4,682.03	\$ 23,410.17	
Total Program Costs	\$20,040.46	\$100,202.32	

Definitions	
Faculty Salaries and Benefits	The total amount of faculty salaries and benefits that will be attributed to this program. Because the program is funded through an auxiliary budget source, a separate line was added to reflect the portion of the Program Director/Department Chair's salary and benefits that are funded through this program. Institutions may further edit the expenses as needed to reflect the unique nature of their program.
Staff and Administrative Support Costs	Includes all non-faculty personnel costs, including benefits, that will be directly and indirectly attributed to this program. Not all categories may be applicable to every program.
Programmatic Expenses	Includes all non-personnel costs that will be directly and indirectly attributed to this program. Institutions may edit the categories in the template to best reflect the programmatic expenses for each program.
Overhead Costs	Any institutional overhead costs associated with the program should be reflected in the table. This can include startup costs, program administration fees, or other fees not represented elsewhere in the table that are attributed to the program from other units within the institution.



Appendix H – Attestations for Self-Supporting or Market Tuition Rate Programs

Instructions: *Please attest to the items below for the proposed self-supporting or market tuition rate programs.*

Please check one of the options below.

- The proposed program will be similar to or a track under an existing E&G program.
- The proposed program is not intended to be a track under an existing E&G program or similar to an existing E&G program.

For a program that will be a track under an existing E&G program or similar to an existing E&G program, the institution attests to the following:

- The institution will provide students with a side-by-side tuition and fee comparison and publicize this information on the institution's public-facing website and any non-public websites or applications that provide information about the program.
- The institution will provide students with information about financial assistance and obligations for repayment of loans for these programs.
- Admissions, graduation criteria, and academic standards for the proposed self-supporting or market tuition rate program align with the criteria and standards for similar or equivalent existing E&G programs.
- Similar or equivalent existing E&G programs will not be closed as a result of the new program unless prior approval is obtained from the Board of Governors.

For a proposed self-supporting program, the institution attests to the following:

- Tuition and fees charged for the proposed self-supporting program will be sufficient to offset the full instructional cost of serving the student and shall not exceed the existing approved tuition and out-of-state fees for similar-level courses.

For a proposed market tuition rate program, the institution attests to the following:

- Offering the proposed program at a market tuition rate will not increase the state's fiscal liability or obligation.

A faint, light blue signature or stamp is visible in the lower right quadrant of the page.