



Item: AS: A-1

**COMMITTEE ON ACADEMIC AND STUDENT AFFAIRS
WEDNESDAY, OCTOBER 19, 2011**

**SUBJECT: REQUEST FOR APPROVAL OF PROGRAM REVIEW – CHARLES E. SCHMIDT
COLLEGE OF MEDICINE**

PROPOSED COMMITTEE ACTION

Request approval of program review for the Master of Science in Biomedical Science in the Charles E. Schmidt College of Medicine.

BACKGROUND INFORMATION

Under Florida Board of Governors Regulation 6C-8.015 adopted March 29, 2007, all academic degree programs in the State Universities must be reviewed at least every seven years. Program reviews ensure that academic programs are administered and delivered effectively, efficiently, and consistent with FAU's mission and the Board of Governors' strategic priorities. The results of program reviews are expected to inform strategic planning, program development, and budgeting decisions at the university level, and when appropriate, at the state level.

Academic program review at FAU is composed of three elements:

- Self-study by the program's department
- Review by the Provost
- Presentation of the program review to the Board of Trustees for approval.

Program review includes a description of the mission and purpose of the program, findings, recommendations and major changes from the last program review; the programs' performance in instruction, research, and service; other program goals; identification of strengths and weaknesses, resource needs; and evidence of student learning and program improvement. Program Review Summary reports are provided to the BOG through an electronic standardized template.

IMPLEMENTATION PLAN/DATE

Upon BOT approval

FISCAL IMPLICATIONS

N/A

Supporting Documentation:

Presented by: Dr. Brenda J. Claiborne, Provost

Executive Summary

Phone: 561-297-3062

Master of Science in Biomedical Science

Charles E. Schmidt College of Medicine

Academic Program Review

Fall 2011

In 1998 the Florida Legislature approved the first of a series of appropriations to build a core biomedical science program at Florida Atlantic University (FAU) to support a regional medical campus of the University of Miami (UM) School of Medicine on the Boca Raton campus of FAU. Subsequent state support was combined with a \$15 million gift from the Schmidt Family Foundation to establish this regional medical campus in a 95,000 square foot facility on the FAU Boca Raton campus, the Charles E. Schmidt Biomedical Science Center.

From an original concept in which UM medical students completed only the first two years of the UM medical curriculum on the FAU campus utilizing primarily FAU biomedical science faculty the program expanded to include the full four year curriculum in Boca Raton. In 2009-10 the FAU Board of Trustees (BOT) concluded that the needs of the citizens of southeast Florida would be best served through establishment of a public medical school at FAU which would allow the university to take full advantage of partnering opportunities with The Scripps Research Institute, Florida (TSRI) through development of a joint MD/PhD degree.

When FAU applied for and received preliminary accreditation from the Liaison Committee on Medical Education (LCME) of the American Medical Association and the Association of American Medical Colleges it did so with the benefit of six years of experience funding and operating a regional medical program. In addition the regional medical campus at FAU had also undergone comprehensive scrutiny as part of the full LCME accreditation review of the UM School of Medicine in 2009, including preparation of a separate database and self-study for the FAU element.

As a key part of the development of the UM regional medical campus and subsequently the Charles E. Schmidt College of Medicine (COM) Florida Atlantic University established a graduate program in 2002 (first enrollments in 2004) to offer the Master of Science (MS) degree in Biomedical Science, which is the subject of the current academic program review. The COM also participates in the Doctor of Philosophy (PhD) program in Integrative Biology offered by the Charles E. Schmidt College of Science at FAU since 2004 which allows students the opportunity to pursue interests across several fields of study including marine science, biotechnology, and biology, as well as biomedical science. In addition, a Biomedical Science Certificate is available to graduate students enrolled in biological sciences, chemistry and biochemistry, complex systems and brain sciences, integrative biology, and psychology as well as biomedical science to provide a focus on understanding and improving human health.

Mission and Purpose of the Program

The Master of Science degree in Biomedical Science offers students interested in pursuing advanced studies in biomedical science both thesis and non-thesis options. The thesis option is oriented toward those students most interested in pursuing biomedical research or careers in academia. The non-thesis option is designed for students whose primary interest is in solidifying their biomedical knowledge base in preparation for application to appropriate professional schools or to pursue careers in the biomedical sciences industry.

Although the primary function of any medical college is the production of physicians, the mission of the MS program in Biomedical Science is not only consistent with but is an important element of the mission of the Charles E. Schmidt College of Medicine, which is stated as follows:

The Mission of the Charles E. Schmidt College of Medicine is to create and sustain an environment of professionalism, scholarship, intellectual enquiry, and inclusiveness that enables our faculty and students to achieve their respective goals as health care professionals and biomedical scholars who are recognized by their colleagues for their professional excellence and by the communities in which they live and work for their involvement and commitment to the health and well-being of their fellow citizens. The College of Medicine is committed to playing a pivotal role in achieving the following critical state goals: (1) producing physicians who are prepared to provide the highest quality health care, and; (2) producing scientists at the forefront of basic, applied and translation biomedical research, including physician-scientists who can meet Florida's biomedical research and medical faculty workforce needs.

In addition, the COM has adopted several guiding principles including the following:

We are committed to providing graduate programs in the biomedical sciences that:

- produce scientists at the forefront of biomedical research and scholarship
- promote collaborative, inter-disciplinary, and innovative approaches to research and inculcate our students with the ability to think creatively
- are responsive to business and industry needs for individuals with scientific training and expertise

The mission of the Charles E. Schmidt College of Medicine is in turn directly supportive of the mission and strategic plan of Florida Atlantic University:

Florida Atlantic University is a public research university with multiple campuses along the southeast Florida coast serving a uniquely diverse community. It promotes academic and personal development, discovery and lifelong learning. FAU fulfills its mission through excellence and innovation in teaching, outstanding research and creative activities, public engagement and distinctive scientific and cultural alliances, all within an environment that fosters inclusiveness.

The MS program in Biomedical Science directly supports the following FAU Strategic Plan Goals and Objectives:

Goal 1: Providing Increased Access to Higher Education

Florida Atlantic University will continue to provide access to higher education for residents of the region, the state and the nation and will respond to the competitive economic environment by increasing the number of degrees granted to students at all levels.

Goal 2: Meeting Statewide Professional and Workforce Needs

The current 2006-2013 FAU Strategic Plan workforce objectives are limited to nursing, engineering, and teaching but it is anticipated that the next strategic plan will incorporate workforce objectives related to medicine.

Goal 3: Building World-Class Academic Programs and Research Capacity

Florida Atlantic University will develop academic and research programs of the highest caliber to support Florida's strategic engagement in building an economy based on high technology and to foster a culture enriched by scholarly inquiry.

Goal 4: Meeting Community Needs and Fulfilling Unique Institutional Responsibilities

Florida Atlantic University will be a full participant in the life of its seven-county service region. It will address economic development, encourage regional cooperation and sustainability, build partnerships in key areas of community need and enrich lives through lifelong learning.

These four goals in turn comprise the four major elements of the State University System of Florida's Strategic Plan adopted by the Board of Governors in 2005 for the period 2005-2013.

Date and description of last external review or last review of this program

The Master of Science program in Biomedical Science first enrolled students in 2004 so the current review is the first for this program under the seven year cycle prescribed by BOG Regulation 8.015. Nonetheless the MS program has been tangentially reviewed or referenced as part of the 2009 review of the Charles E. Schmidt College of Science program review which included the program in Integrative Biology, and as a component of two LCME reviews. As noted previously the LCME conducted a comprehensive review of the University of Miami Miller School of Medicine in 2009 including a full, separate review of the regional medical campus a FAU with preparation of completely separate analytical materials for the regional campus. In addition, LCME completed a further comprehensive scrutiny of all aspects of the emerging Charles E. Schmidt College of Medicine as part of the process of receiving preliminary accreditation and approval to admit an entering class of medical students in fall 2011.

One standard for LCME accreditation at each level of review requires that: "A medical school should be a component of a university offering other graduate and professional degree programs that contribute to the academic environment of the university." Further, LCME stipulates that: "There should be regular and formal review of all graduate and professional programs in which medical school faculty participate, to foster adherence to high standards of quality in education, research, and scholarship, and to facilitate the progress and achievement of the trainees."

To this end the LCME preliminary accreditation visiting team included a review of the related graduate programs within the College of Medicine and the College of Science in which COM faculty participate at FAU including the MS program in Biomedical Science. The LCME preliminary accreditation review produced remarkably few negative comments or recommendations for improvement and no negative findings related to the MS program in Biomedical Science. It should be noted further that the

LCME accreditation team site visitors report from the 2009 review of the UM Miller School of Medicine found the FAU regional medical campus to be “well-conceived and implemented” and the report cited the FAU regional medical program as one of the five strengths of the UM medical school.

In sum, although the MS program in Biomedical Science at FAU has not been specifically reviewed previously, tangential reviews by FAU and the LCME have reported no negative comments or areas of needed improvement relative to this program.

Instruction

Review of the instructional program begins with an examination of Part I of the Departmental Dashboard indicators provided by the FAU Office of Institutional Effectiveness and Assessment (IEA) for the 2009-2010 academic year. The first element (B1) reports the Headcount, Person Years and FTE—Overall and Devoted to Instruction for the Department of Biomedical Sciences. Of the 53 persons affiliated with the program in a professional capacity, 16 are full-time permanent (tenured or tenure-earning) faculty, one is on a non-tenure earning line, five are scholars or research faculty, one is adjunct, 20 are graduate assistants, and ten are in other categories such as advisors and administrators.

For comparison purposes university-wide faculty effort is often reported in terms of full-time equivalent faculty in which one FTE equates to a full-time workload for the fall and spring terms (or .75 of a person year). Of note, in the Department of Biomedical Science 90% of the instructional effort is provided by full-time faculty as compared to a benchmark of 40% for the university as a whole. Of course, a graduate program relies heavily on full-time faculty but these figures reflect a high commitment to teaching and only rare reliance on adjuncts, visiting or other types of temporary faculty.

The second DDI element (B2) examines Instructional Faculty and Adjuncts by Gender and Ethnicity. In a pattern common in the sciences, Blacks and Hispanics are underrepresented (one Hispanic) while Asians are strongly represented, in fact comprising 53% of the permanent faculty. The single adjunct in the department is a white male. Women comprise 41% of the permanent faculty.

Achievement of diversity in faculty, staff, and students is a major goal overall for the Charles E. Schmidt College of Medicine, including the Department of Biomedical Sciences. In terms of faculty hiring the College and the Department strongly embrace university efforts in this regard. The FAU Office of Equal Opportunity Programs, in collaboration with the FAU Department of Human Resources has developed a hiring “toolbox” that identifies strategies that have proven to be effective in: (a) assuring the diversity of the candidate pool for a new faculty or staff position; and (b) successfully recruiting qualified faculty and staff from protected classes. Among the strategies that the FAU COM employs to maximize success in attracting diverse candidate pools for faculty and staff positions and successfully employing highly qualified applicants from diverse backgrounds for these positions are: (a) going beyond traditional sources (Chronicle of Higher Education, AAMC CareerConnect. etc.) for strategic placement of advertisements in journals and on websites with a diverse readership; and (b) establishing networking relationships with doctoral granting institutions that have been identified by the FAU EEO Office as graduating a high number of women and minorities.

The FAU Office of Equal Opportunity Programs and the FAU Department of Human Resources have also collaborated to develop guidelines to assist FAU colleges and academic programs to establish mentoring programs between newly hired and more senior faculty and staff. Such mentoring programs

have been shown to be highly effective mechanisms for the retention of all new hires, and particularly those who are minorities. The College of Medicine has utilized an informal mentoring program for new faculty and staff but is now establishing a more formal mentoring process to ensure that newly hired faculty and staff, generally, and particularly those who are minorities are successful in their careers, feel welcome within the College and become committed to remaining at FAU.

DDI element B3 describes Average Course Section Size and Percent of Sections Taught by Faculty. At the graduate level the Department of Biomedical Science offered 15 lecture sections in 2009-10 with an average section size of 18.6 compared to a university benchmark of 13.2. Nearly all of these (93.3%) were taught by permanent faculty members compared to 82.1% for the university average at the graduate level. An additional 67 sections were taught essentially to individual students (1.1 section size compared to 1.8 university average), primarily through directed independent study (DIS) and thesis direction.

The number of Majors Enrolled (Annual Headcount) By Gender and Ethnicity is item B4. Although MS in Biomedical Science students represent only 1.5% of the total university master’s level enrollment, The MSBS program strongly supports university and college goals for achieving student diversity by reflecting the diverse nature of the population of southeast Florida. Nearly 13% of the students enrolled in this program are Black, which exceeds the university graduate average of 11.8%. Asian students nearly double the university graduate average with 8.7% compared to 4.4%. The Hispanic component nearly parallels the university graduate population, 11.6% to 12.5%. Almost 12% of students in the program are international as compared to 7.5% of all university graduate students, and female students comprise a slight majority of enrollments (50.7%).

Majors by Gender and Ethnicity (Percent of Graduate Students)			
		MS in Biomedical Science	FAU
Asian		8.7	4.4
Black		13.0	11.8
Hispanic		11.6	12.5
White		55.1	62.2
Non-resident alien		11.6	7.5
Female		50.7	61.7

Item D2 reports the number of Degrees Awarded per Faculty Instructional Person Year as a measure of faculty productivity. In this regard the MS program in Biomedical Science significantly surpasses the university master’s level productivity, 3.3 degrees per program faculty person year compared to the university average of 2.4 degrees per faculty person year.

Student perceptions of quality of instruction and ratings of individual faculty members as instructors are summarized in item E1 as a measure of instructional effectiveness. Quality of instruction was rated by MS students in Biomedical Science during 2009-2010 as “Very Good” (2.0). Instructors in this program were also rated at the second highest level of “More Effective than Others” (2.2).

An additional evaluation of effectiveness (item E2) is provided by selected elements of the Student Satisfaction Survey, specifically in regard to student satisfaction with the quality of courses and instructors in the degree program and advising by advisors and faculty members in the program. On each of these measures the MS program in Biomedical Science exceeds the ratings for the university as a whole as displayed below. The survey scale is 1=Poor, 2=Fair, 3=Good, and 4=Excellent. On each item measured the program was rated in 2009-2010 as Good to Excellent.

(Graduate) Student Satisfaction with Instructors and Advising				
		MS in Biomedical Science		FAU
Quality of courses in degree program		3.5		3.2
Quality of instructors in degree program		3.6		3.3
Quality of advising in college advising office		3.1		2.8
Quality of advising by faculty		3.2		3.0

The MS program in Biomedical Science first established an assessment plan in 2006-2007 and the plan has been expanded and improved each subsequent year, with significant modifications and improvements in the 2008-2009 academic year. The assessment plan and report which forms the basis for the current review is that for the academic year 2009-2010. The plan established seven specific goals for student learning (learning outcomes) which provide the basis for assessment of the instructional program:

Outcome 1

Graduates will be able to demonstrate broad knowledge of Biomedical Science topics and specific areas of research that were the focus of their Master's degree studies including but not limited to:

- Be familiar with the structures of biological macromolecules and types of changes associated with human diseases
- Understand biosynthesis & processing of DNA, RNA and proteins
- Be familiar with different types of inheritance
- Understand cellular structures and organelles and be familiar with the functions of organelles
- Understand the cell cycles and signal transduction
- Have a basic understanding of immunological principles and processes

Outcome 2

Graduates will be able to critically review and interpret scientific information.

- Identify the main hypothesis of a research plan in a scientific paper
- Critically evaluate the design of experiments conducted to test a hypothesis
- Determine if experimental procedures are described in sufficient detail to repeat
- Assess the quality of data and magnitude of errors as appropriate
- Evaluate the significance of research results and how they contribute to the field
- Analyze a problem and evaluate possible solutions
- Demonstrate a basic understanding of the relationship between research and clinical applications

Outcome 3

Thesis graduates will understand scientific principles and demonstrate competence in the scientific method and be familiar with ethical principles governing research.

- Create the main hypothesis of a research plan
- Critically evaluate the design of experiments conducted to test a hypothesis
- Determine if experimental procedures are described in sufficient detail to repeat
- Assess the quality of data and magnitude of errors as appropriate
- Evaluate the significance of research results and how they contribute to the field.

Outcome 4

Thesis graduates will be able to demonstrate knowledge of and competence in basic laboratory policies & procedures.

Outcome 5

Students will demonstrate effective written and oral communication skills.

Outcome 6

Non-thesis graduates will be able to be employed in professional positions or enter a professional school upon graduation.

Outcome 7

Thesis graduates will be prepared to pursue additional graduate study towards a doctoral degree, enter a professional school or be employed in a professional position.

Evaluation of achievement of these goals (learning outcomes) is assessed through methods which include course level evaluations (examinations, papers, presentations, and evaluation of lab work by lab supervisors) for all students. Non-thesis students are required to complete exit examinations in critical subject areas. The thesis serves as a capstone evaluative device for students selecting this path, and each thesis (proposal, research, document, and presentation) is evaluated as a comprehensive demonstration of mastery by the supervisory faculty committee. The level of preparedness of non-thesis students to enter a professional school upon graduation or their employability is measured by graduate exit surveys and post-graduation tracking of alumni.

Results of course level evaluations in 2009-2010 show that more than 95% of students enrolled in the MS program in Biomedical Science were successful in achieving the required 3.0 GPA in graduate coursework to maintain matriculation toward the degree. Non-thesis students completed 102 exit examinations with an initial pass rate of 98%. Thesis students successfully completed the thesis-related research course with a 95.5% pass rate (one unsatisfactory grade), and the thesis writing course with a 100% pass rate. Both thesis proposals submitted were successfully defended and the one thesis submitted was successfully defended. All 13 thesis students enrolled in the required graduate seminar successfully completed the course.

Twenty-four students graduated from both the non-thesis and the thesis tracks in 2009-2010. Alumni surveys report that 13 of 14 graduates who had completed applications to a health professions

or other academic program were accepted while the remaining applicant was placed on a waiting list for admission. Four of the remaining ten graduates had not applied to professional school at the time of the survey but intended to do so. Results for the remaining six graduates were not reported and unknown.

Student Achievement			
In Program		Alumni	
Maintained required GPA (3.0)	95.3%	Graduates	24
Passed exit exams	98.0%	Applied to professional or academic program	14
Passed thesis research course	95.5%	Accepted	13
Passed thesis writing course	100.0%	Waitlisted	1
Defended thesis proposal (2/2)	100.0%	In process of applying	4
Defended thesis (1/1)	100.0%	Unknown	6

As observed previously, each iteration of the assessment process has produced improvement in the process and the program, with significant process enhancements in the 2008-2009 year. Learning objectives have been continually refined with significantly improved measures of student success.

The program is intentionally designed to provide maximum flexibility to students in course selection to allow them to tailor the program in the direction of their individual interests and needs within the parameters of the offerings within the College of Medicine as well as related offerings within the College of Science. The assessment process, however, illuminated the need for and benefit of identifying certain commonalities both for the measurement of student achievement and for consistency within the degree. To that end college faculty identified those areas of broad knowledge in Biomedical Science topics and specific areas of research for which every graduate must be able to demonstrate mastery. All students are now required to complete a minimum of 15 credit hours of Biomedical Science coursework. Four particular courses are now offered annually to assure access and consistency: Macromolecules and Human Disease, Advanced Cell Physiology, Introduction to Radiation Biology, and Molecular Neuropsychopharmacology.

Feedback from students led to the provision of three new courses beginning in summer 2010: Clinical Microbiology, Fundamentals of General Pathology, and Problem-based Immunology. Eleven other courses developed originally as special topics were also established as permanent elements of the inventory on the basis of student demand.

In addition the Graduate Program Committee (GPC) reviewed exit examinations for validity and accordingly revised examination guidelines. Thesis guidelines are also under review by the GPC.

Research

Part II of the Departmental Dashboard Indicators provides annual information relevant to research and creative and scholarly activities. As related to the MS program in Biomedical Science the relevant measure of creativity is research, departmental and especially sponsored. While the department of Biomedical Science faculty represent 2.5% of total university faculty person-years, these Biomedical Science faculty provided in 2009-2010 4.6% of university departmental research person-years and 9.6% of university sponsored research person-years (item B1). This effort produced 13.7% of

all sponsored research expenditures at FAU in 2009-2010 (\$2,511,986 of \$18,327,467; item C7). Sponsored research is often supported through multi-year awards of varying amounts, yet the above level of sponsored research funding for the department of Biomedical Science has been fairly consistent throughout the period of this program review. Most recently (June 2011), Associate Professor Massimo Caputi was awarded a \$433,500 grant from an element of the National Institutes of Health to further his research on identifying novel drug treatments for HIV.

An examination of efficiency data is provided in DDI items D1-9, in which items D 2, 6, and 7 are most relevant to this program. Biomedical Science exceeds the university average on each relevant measure. Faculty members in this department produced 2.2 peer reviewed publications per faculty member in 2009-2010 as compared to the university average of 1.7. They submitted 1.6 grant proposals per faculty member as compared to the university average of .9, and faculty members in Biomedical Science produced an average of \$156,999 per faculty member in sponsored research funds in 2009-2010 compared to an average of \$27,112 for the university faculty as a whole, nearly six times the university average. While it is to be expected that science based departments will produce more sponsored research than some others, the data above support a determination that the faculty of Biomedical Science fulfilled departmental goals and expectations in this regard.

These goals are described in the department assessment plan, which provides two desired outcomes related to research. The first states that: "Tenure-track faculty will conduct research and publish papers in peer-reviewed scientific journals," with at least one paper published per year on average. As noted above, in 2009-2010 Biomedical Science faculty published an average of 2.2 peer-reviewed papers, more than doubling the goal. The second goal states that: "Tenure-track faculty will obtain sufficient external research funding to support their research programs," with existing faculty maintaining funding at levels sufficient to continue their research. Again as noted above, review of the DDIs supports a determination of achievement of this goal.

Service

The third section of the Department Dashboard Indicators reports on elements related to faculty service, the usual third component of university faculty assignments. Elements of faculty service productivity are reported in terms of membership on committees within and outside the university and as editors or referees for professional publications. On each of these measures the members of the department of Biomedical Science were below the university benchmark in 2009-2010. Members of the department provided 2.1% of university, college, or department level committee membership, 1.6% of community or professional committee participation, and .8% of editors or referees for professional journals as compared to the benchmark of 2.5% of university faculty person-years. The same pattern is observed in comparisons of these measures on a per faculty member basis.

Two factors may help explain this divergence. First, and perhaps most importantly, is the foundational fact that the three elements of most faculty assignments, instruction, research, and service add up to a whole, and it has been seen that Biomedical Science faculty exceed university faculty averages in terms of instruction, and significantly exceed university averages in terms of research. Secondly, beginning in 2008-2009 reporting of service within the department is well scrutinized and carefully reported. Lastly, it should be noted that the department assessment plan encourages both committee membership and professional service and 94% of faculty assignments include a 5-10% service component.

Other program goals

The goals for the Master of Science program in Biomedical Science are fully described and discussed above. The program has no goals beyond those of instruction, research, and service.

Strengths and opportunities

As reported in the Departmental Dashboard Indicators the department of Biomedical Science performs above the university average in terms of instructional effort by full-time faculty, and it performs significantly above the university norm in terms of research and especially sponsored research. Opportunities for even greater research effort should be enhanced by the emergence of the Charles E. Schmidt College of Medicine as an independent FAU entity and expansion of partnerships, especially with The Scripps Research Institute, Florida.

Enrollments and graduations in this program have been relatively strong to date, indicating that the program has been responsive to student demand. The program has granted an average of 25 degrees per year since its inception.

Benefitting from its home within the College of Medicine this program consumes relatively few resources. A more detailed resource analysis is provided below.

Most importantly, all indications are that the Master of Science program in Biomedical Science is fulfilling its mission, particularly in terms of preparing students for further study and pursuit of professional degrees in health-related fields. This mission appears to be responsive of student demand and societal need.

Weaknesses and threats

As valuable and worthy of continuation as this program is demonstrated to be, a program of this nature will always be ancillary to the primary mission of a College of Medicine, which is the medical education of physicians. By definition this mission must come first. Nonetheless, this fact presents no existential threat to the MS program in Biomedical Science; it is simply a reality that is acknowledged.

Enrollment in the MS program in Biomedical Science has been relatively strong with 69 students enrolled in 2009-2010 but the entering class of 2011 is below this level (at this writing by 37%). It is important to note, however, that admissions to this program tend to be year-round and may rebound in the spring term. In addition FAU graduate level enrollment is down in general which may be reflective of economic and other broad factors. More directly, lowered admissions numbers may be the result of increased selectivity in admissions. The average GRE score for newly enrolled students increased from 1,092 in fall 2006 to 1,164 in fall 2010, while the average undergraduate GPA increased from 3.3 to 3.7 during the same period.

Review of the assessment program indicates that while improvements have been made to the plan, process, and program, more is needed. In particular the university assessment office suggests that the department develop a curriculum map to link desired learning outcomes to specific courses, and that measurable sets of criteria be developed to assess student competence.

Lastly, as noted above, the provision of adequate graduate student support is a near universal concern with graduate programs. This one is no exception.

Resource analysis

From 1998 to 2009 the Florida Legislature appropriated a total of \$14.4 million to support the development of the four-year regional medical education program at FAU which has now become the Charles E. Schmidt College of Medicine. This amount was subsequently reduced in 2008 and 2009 by \$2.44 million. In 1998 FAU also received a \$15.0 million gift from the Schmidt Family Foundation which was matched by the State of Florida. Of this funding, \$20.0 million was used to construct the Charles E. Schmidt Biomedical Science Center, a 95,000 square foot facility designed specifically to house the FAU biomedical science program and now the Charles E. Schmidt College of Medicine. As a result of these appropriations and this extraordinary gift the College of Medicine is fully capable of supporting both the medical education program for 256 medical students and the MS program in Biomedical Science at current and even increased levels of enrollment if demand warrants expansion, both in terms of space and faculty personnel.

Faculty efforts within the department of Biomedical Science are generally assigned as approximately 40% devoted to instruction, 50% to research, and 10% to service. Half of the instructional portion of the assignment is generally in support of the MS program in Biomedical Science and half is in support of the medical education program. In addition the college provides a full-time Academic Program Specialist for Graduate Studies. This position, among other duties, provides academic advice and guidance to all students enrolled in the MS program in Biomedical Science.

Graduate student support is an area of concern within this program as it is in many other areas within the university and broadly. Since the college does not house any undergraduate degree programs, graduate teaching assistantships (GTA) are rarely available, and then mostly for those students who may obtain an appointment within the College of Science. Graduate students may also secure a sponsored research assistantship (GRA) with a professor within the department of Biomedical Science or the College of Science. In the current term, 20 students are receiving some kind of support, 16 as GTAs in Biology, two on an NSF research grant in Chemistry, one as a GTA in the College of Medicine, and one as a research assistant in the College of Medicine.

Overall, however, resources are fully sufficient to meet program goals.

Major findings and recommendations

In compliance with the Florida Atlantic University Academic Program Review Procedures for 2007-2014 Reviews and with BOG Regulation 8.015 this review has described and analyzed the mission and purpose of the program, previous reviews, data and assessment of the core functions of instruction, research, and service. It has identified strengths, opportunities, weaknesses and threats, and examined the adequacy of resources to meet program goals.

The major findings of this review are that the program is fulfilling an important need, that the program has sufficient resources to continue at current or higher enrollments, and that the program is successful in achieving its mission and purpose. It is recommended that the program be continued.

Appendix

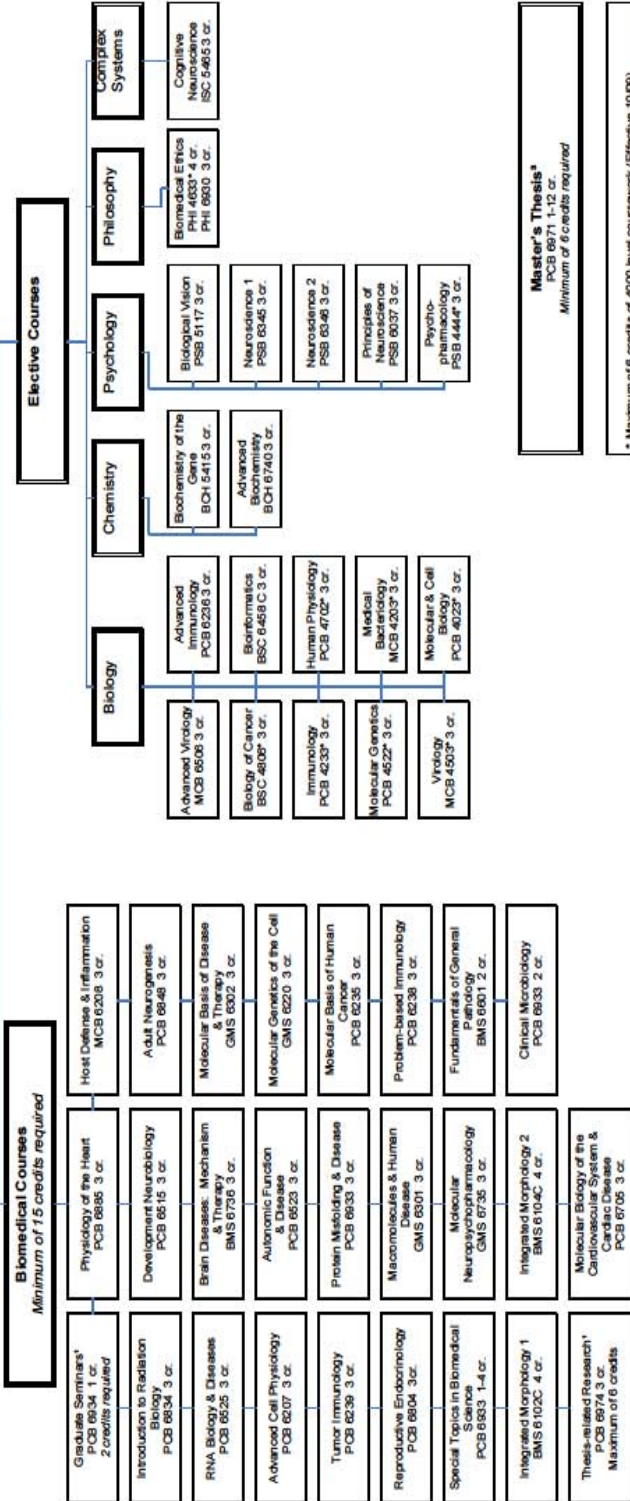
Program Guides

Master of Science in Biomedical Science

Thesis and Non-thesis

**Master's Degree in Biomedical Science
Program of Courses: Thesis Track**

30 Credits Total



Master's Thesis*
PCB 6871 1-12 cr.
Minimum of 6 credits required

* Maximum of 6 credits of 4000 level coursework (Effective 10/09)
* 2 credits (2 semesters, 1 credit per semester) of Graduate Seminar required
* 6 credits of Thesis required

