

03-40
For information

Date: Feb. 27, 2004

To: Gail Sechrist, UWUCC

From: Carl Luciano

Subject: Accelerated MS Track Proposal

Gail,

I am sending a copy of the latest version of the proposal for a 5-year Accelerated Track Master's degree in Biology. I see this as completely a graduate-level proposal, but students who enroll in the track will take graduate courses during their undergraduate years at IUP and so I would like to notify the UWUCC of the proposal's existence.

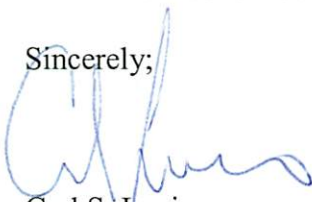
I believe that the proposed graduate track will have essentially zero impact on undergraduate curricular issues. However, I do believe that the proposed track will have an intellectual impact on undergraduate students who enroll. I have explained this in the second paragraph on Page 2 of the proposal.

The proposal is currently in review by the Biology Department Graduate Committee and is likely to be reviewed by the entire Department soon after Spring Break. Resource issues will be negotiated with administration.

I would like for you to take a quick look at the proposal and let me know if it needs to be submitted formally to the entire UWUCC. If not, I request a memo or email to that effect that I will include with the proposal as it moves through the review process.

Of course I also welcome your comments on the proposal and your support. Please contact me at 357-2352 or via email if there are any questions.

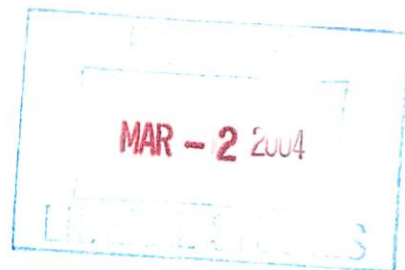
Sincerely;



Carl S. Luciano

Professor and Department Chair

Department of Biology



Level I Proposal for a New Track

M. S. in Biology-Accelerated Track (Version 2.0)

1. Graduate Curriculum Authorization Form (Appendix D)

The complete Authorization Form is included as the previous page of the proposal.

2. Introduction

2.a. Short introduction with definitions

The Department of Biology proposes an accelerated curriculum track that offers an alternative pathway for progression through the requirements for the degree of Master of Science in Biology. The proposed track will lead to the Master of Science degree with one slightly more than one year of post-baccalaureate study as opposed to the two years usually required in the traditional track. Compared to the traditional curriculum track the accelerated track includes one less elective class and provides a more concentrated exposure to scientific inquiry. The accelerated track is intended as an addition to the Department's graduate program and not as a replacement for the traditional track. The accelerated track is aimed at ambitious, highly-motivated IUP undergraduates with a career interest in any area of the biological sciences represented in the IUP Department of Biology. Upon completion of this program students will be prepared for skilled technical positions in the industrial or academic workforce or for advanced study in outstanding graduate or professional schools.

The IUP Department of Biology has a long-term commitment to learning science by doing science. This commitment to active learning is illustrated by the inclusion of integral laboratory components in most classes and the availability of research opportunities for undergraduates outside the classroom. The National Science Foundation has recognized our commitment with grant awards that total over \$1M in the last decade. The proposed Accelerated Track thus represents a natural extension of department philosophy and a logical addition to its existing programs.

Academic programs leading to a five-year master's degree are common in the United States. A simple Google search for such programs generated numerous hits with most five-year master's programs housed in departments of computer science, engineering or other applied sciences. The internet search also revealed several five-year programs in biology or related disciplines and the most relevant of these are listed in Appendix A. Each five-year program contains a unique set of characteristics that reflect the idiosyncracies of its institution and the requirements of its discipline. Our proposed program is not based on any single model but is probably more similar to the programs at Michigan State (Physiology) and Arizona (Biochemistry) described in Appendix B than to any other programs.

Five-year master's programs at other institutions are known by many different names or titles. These titles include terms such as "integrated", "combined", "concurrent", "coterminal", "blended", "seamless", "4 + 1", "fast track", "streamlined" and others. Our proposed five-year program is best defined as an "accelerated" master's program because the bachelor's and master's degrees are awarded separately and no course or other academic experience counts toward both degrees. Our program fits the SSHE definition of a track rather than the definition of a new program because the proposed program has the same core requirements as the existing program and differs from the existing program only in the number of elective courses.

The proposed program is exclusively a master's program and it involves only graduate-level courses. The proposed program does not include or affect undergraduate courses, curricula or requirements (e.g. the 120-credit mandate). However, because students in the proposed program will take graduate courses and conduct graduate-level research concurrent with last 1-2 years of the undergraduate curriculum, the Accelerated Track will influence the quality of their undergraduate experience. Compared to other IUP undergraduates, students in the Accelerated Track will receive a more concentrated exposure to scientific inquiry and will acquire a more sophisticated background in the life sciences.

Briefly, in the proposed program, an IUP undergraduate with an excellent academic record and recommendations may select a faculty mentor, identify a research project and apply to the program during the junior year. The student begins work toward the master's degree as early as the junior year, continues working toward both degrees through the senior year and then completes the master's research project, including the thesis, during the fifth or graduate year. The proposed program works because students take graduate courses for graduate credit prior to completing the requirements for a bachelors degree, because students may conduct research or take classes during the summer and because the Accelerated Track requires 3 fewer semester hours than the traditional six-year track.

2.b. Summary of the proposal

2.b.i. Course and credit requirements

Students who successfully complete the proposed program will earn 32 semester hours of credits according to the following divisions. Students in the Accelerated Track may not pursue a non-thesis option.

I. Core Courses (20 semester hours)

IA. Required Courses	11 s.h.
BIOL 602 Biometry	3 s.h.
BIOL 611 Biology Seminar I	1 s.h.
BIOL 612 Biology Seminar II	1 s.h.
BIOL 850 Thesis	6 s.h.

IB. Core Elective Requirement 9 s.h.

Nine semester hours of course credit selected from biology majors' electives and must include one cell/molecular biology course, one organismal biology course and one ecology course

II. Elective Courses (12 semester hours)

Students must take twelve semester hours of courses to be selected with the approval of the thesis advisor from the 500- and 600-level biology elective courses or from related science and mathematics courses. In many courses in the Department of Biology, additional laboratory time may be required beyond the regularly-scheduled periods.

III. Competency Exam

Every student must take a competency exam administered by the candidate's thesis advisory committee. The purpose of this exam is to ensure that all graduates have a broad-based knowledge of biology, as well as a mastery of their subject matter directly or indirectly pertaining to their research project. This examination must be scheduled after the completion of 18 semester hours but before the completion of 27 semester hours. If a student fails this exam, a second exam will be administered which, at the discretion of the committee, can be oral or written. This exam must be taken within a four-month period following the first exam. Failure of the second exam will result in dismissal from the program.

IV. Research Requirement

The candidate must conduct original research under the direction of the thesis advisory committee and present a research thesis at the conclusion of the program. The candidate registers for BIOL 850 Thesis, while engaged in research and preparation of the thesis. The candidate will present a public seminar, reporting results of the research, and an oral defense before the thesis committee.

2.b.ii. Required courses

The proposed Accelerated Track includes the following four required courses for a total of 11 s.h.

BIOL 602 Biometry	3 s.h.
BIOL 611 Biology Seminar I	1 s.h.
BIOL 612 Biology Seminar II	1 s.h.
BIOL 850 Thesis	6 s.h.

The traditional track includes the same four required courses. Appendix C contains the catalog descriptions for these courses.

2.b.iii. Elective courses

The proposed Accelerated Track requires a total of 21 s.h. in elective courses. These must include one cell/molecular biology course, one organismal biology course and one ecology course for a total of 9 s.h. of course credit. The balance of the elective requirement is fulfilled by 12 s.h. of courses to be selected with the approval of the thesis advisor from the 500- and 600-level biology elective courses or from related science and mathematics courses

A list of all current 500- and 600-level Biology courses appears below and Appendix C contains catalog descriptions of these courses. This list will change as Biology faculty retire (several expected over the next five years), taking their specialty areas with them, but it illustrates the variety of courses that will be available to students in the Accelerated Track.

Courses Appearing in the Graduate Catalog

BIOL 525 Herpetology (O)
BIOL 550 Pymatuning: Field Studies (E/O)
BIOL 553 Plant Physiology (CM)
BIOL 563 Limnology (E)
BIOL 564 Immunology (CM)
BIOL 566 Principles of Virology (CM)
BIOL 575 Mammalogy (O)
BIOL 576 Parasitology (O)
BIOL 581 Special Topics (CM or E or O)

BIOL 603 Advanced Techniques in Biology (CM or E or O)
BIOL 622 Advanced Ornithology (O)
BIOL 623 Animal Morphogenesis (O)
BIOL 624 Advanced Entomology (O)
BIOL 631 Plant Ecology (E)
BIOL 641 Population and Community Ecology (E)
BIOL 645 Behavioral Ecology (E)
BIOL 650 Plant Systematics (O)
BIOL 651 Physiological Ecology of Animals (E)
BIOL 653 Animal Physiology (O)
BIOL 662 Molecular Genetics of Eukaryotes (CM)
BIOL 681 Special Topics (CM or E or O)
BIOL 699 Independent Studies

Courses in the Approval Process

BIOL 505 Biology of the Cell (CM)
BIOL 555 Animal Behavior (E)

BIOL 556 Ecological Toxicology (E)
 BIOL 560 Environmental Epidemiology (E)
 BIOL 571 Dendrology of the Eastern U. S. (O)
 BIOL 577 Neurobiology (CM)
 BIOL 590 Field Studies in Biology (E)

(CM) = Cell/Molecular course, (E) = Ecology course, (O) = Organismal course

2.b.iv. Tracks

The proposed Accelerated Track does not include sub-tracks or options.

2.b.v. Side-by-side comparison table

Traditional Track Total Credits Required = 35*	Accelerated Track Total Credits Required = 32*
I. Core Courses (20 semester hours)	I. Core Courses (20 semester hours)
IA. Required Course (11 s.h.)	IA. Required Courses (11 s.h.)
BIOL 602 Biometry 3 s.h.	BIOL 602 Biometry 3 s.h.
BIOL 611 Biology Seminar I 1 s.h.	BIOL 611 Biology Seminar I 1 s.h.
BIOL 612 Biology Seminar II 1 s.h.	BIOL 612 Biology Seminar II 1 s.h.
BIOL 850 Thesis 6 s.h.	BIOL 850 Thesis 6 s.h.
IB. Core Electives (9 s.h.)	IB. Core Electives (9 s.h.)
BIOL XXX Cell/Molecular Course 3 s.h.	BIOL XXX Cell/Molecular Course 3s.h.
BIOL XXX Organismal Course 3 s.h.	BIOL XXX Organismal Course 3 s.h.
BIOL XXX Ecology Course 3 s.h.	BIOL XXX Ecology Course 3 s.h.
II. Elective Courses (15 s.h.)*	II. Elective Courses (12 s.h.)*
Fifteen semester hours of courses to be selected with the approval of the thesis advisor from the 500- and 600-level biology elective courses or from related science and mathematics courses	Twelve semester hours of courses to be selected with the approval of the thesis advisor from the 500- and 600-level biology elective courses or from related science and mathematics courses
III. Competency Exam	III. Competency Exam
Required	Required

3. Appropriateness to Mission

3.a. Statement of goals and objectives

The goal of the proposed program is to prepare our best, most highly motivated undergraduate students for skilled technical positions in the industrial or academic workforce or for advanced study in graduate or professional school. The objectives for student learning (a.k.a. performance objectives, intended student outcomes, intended educational outcomes) of the proposed program are three-fold. First, students who complete the Accelerated Track will demonstrate sufficient knowledge in the specialized area of research to formulate, test and defend an original thesis. Second, these students will also acquire sufficient breadth of knowledge in biology to provide an intellectual context for the research problem and to appreciate the diversity of modern biology as a discipline-in short, to think as a biologist thinks. Third, students will apply the scientific method (including technical skills) to the research problem as appropriate. The Accelerated Track can serve as an important bridge for students who wish to continue postgraduate education beyond the master's level or provide a competitive advantage to those who wish to enter a changing and increasingly demanding job market in science and technology.

3.b. Relevance to SSHE mission

The proposed Accelerated Track advances SSHE Mission Statement #1 by providing an opportunity to achieve excellence through a high-quality, intensive educational experience delivered at the lowest possible cost. Costs to the student are minimized as a result of the reduced time commitment for students and by lower tuition rates.

The proposed Accelerated Track advances SSHE Mission Statement #2 by providing students with opportunities for research, scholarly achievement and personal growth not available in traditional progression through bachelor's and master's degrees.

The proposed Accelerated Track advances SSHE Mission Statement #6 by meeting a specialized statewide educational need in the area of biotechnology/life sciences. The Commonwealth's Department of Economic and Community Developments has articulated the size and importance of this sector of Pennsylvania's economy on its web site <http://www.inventpa.com/default.aspx?id=122>.

The proposed Accelerated Track advances SSHE Mission Statement #7 by participating in economic revitalization through the training of individuals for a modern technical workforce.

3.c. Relevance to IUP mission

The proposed Accelerated Track advances the IUP mission by addressing the following statements.

“The mission at the master’s and specialist/certificate levels is to sustain and develop programs of similarly high quality while, in general, emphasizing more applicable professional skills. Master’s and specialist/certificate programs should be based on institutional strengths and should, in addition to other goals, address state and regional needs.”

“IUP is committed to conducting and disseminating basic and applied research and expects and encourages scholarly activity in all forms.”

The proposed Accelerated Track also advances the IUP mission by addressing the recommendation of the UPC to establish five-year bachelor/master’s programs, articulated in the **Academic Planning and Academic Targets of Opportunity** section of the UPC Final Report to the President submitted on May 12, 2003.

4. Need and Impact

4.a. Evidence of need

4.a.i. Student demand

The Accelerated Master of Science curriculum described in this proposal is a new track for an existing program with a long independent history; it is not a brand-new program. The Accelerated Track does not propose new courses, require significant resources, or expect a large number of students. It is intended to be a low-cost program aimed at increasing the quality of students within the Biology Department rather than increasing their quantity. All these characteristics of the proposed Accelerated Track argue against a full-scale needs survey. Instead, we conducted an opinion poll administered to students enrolled in classes for Biology majors in January, 2004. The results of this survey will be added here as soon as they are available.

4.a.ii. Career enhancement opportunities

In the 2002-2003 Occupational Outlook Handbook (1) the United States Department of Labor predicts faster-than-average growth in jobs for biological and medical scientists in the forecast period from 2000-2010. The job outlook includes better opportunities for individuals with a master's or bachelor's degree than for those with a doctoral degree because individuals in the last group are expected to face stiff competition for available positions as independent researchers or university faculty.

“Opportunities for those with a bachelor's or master's degree in biological science are expected to be better (than opportunities for Ph.D.s). The number of science-related jobs in sales, marketing and research management, for which non-Ph.D.s usually qualify, are expected to be more plentiful than independent research positions. Non-Ph.D.s may also fill positions as science or engineering technicians or health technologists and technicians. Some become high school biology teachers, while those with a doctorate in biological science may become college and university faculty.” (1)

The same publication reports that in 2000 beginning annual salary offers averaged \$29,235 for bachelor's degree recipients as opposed to \$35,667 for master's degree recipients. (1)

In a report published on August 14, 2003, The National Science Board, a policy arm of the National Science Foundation, pointed out the critical role of science and technology as engines of economic growth and national security. The Board also noted the dependence of national science and technology efforts on an ample and well-educated workforce and commented that the United States' future strength in science and engineering fields is at risk due to two long-term trends. The first trend is a decline in the number of native-born science and engineering graduates and the second is an increase in international competition for well-trained scientists and engineers. To forestall a projected deficit in the number of trained

individuals for the American science and engineering workforce, the National Science Board recommended action by the federal government to direct substantial new resources to the support of students and institutions in order to improve success in the study of science and engineering (2).

The 2001 Hart/Rudman Report sponsored by the United States Department of Defense (3) summarized its conclusions pertaining to science education and training in a section entitled "Recapitalizing America's strengths in science and education". In this section of the report, the authors reached essentially the same conclusion as the National Science Board but also underscored the importance of teaching science as an inquiry- and discovery-based activity (3). Other reports (4, 5, 6) over the last few years have emphasized the importance of integrating research with education and incorporating opportunities for hands-on activities into the curriculum.

The Pittsburgh Life Sciences Greenhouse is a consortium of Carnegie-Mellon University and the University of Pittsburgh allied with economic development groups, local governments and biotechnology trade organizations based in southwestern Pennsylvania (<http://www.pittsburghlifesciences.com/default.aspx>). This initiative is funded by approximately \$30M each year derived from the Commonwealth's share of the national tobacco settlement. The goal of the Greenhouse project is to foster the growth of the biotechnology industry in Pennsylvania's southwestern region, with hospitals and universities in Pittsburgh acting together as a hub. "Strategy Three" of the Life Science Greenhouse "Invest in and grow the region's talent pool in the biosciences, from entry to senior-level personnel" clearly articulates their emphasis on the region's need for a trained workforce.

Taken together, these reports and studies suggest the availability of jobs for biological scientists in the next 5-10 years and a growing regional/national need for trained individuals to fill the expected positions. We expect students who complete the Accelerated Track to be very competitive compared to applicants with only a bachelor's degree or compared to individuals who a master's degree completed via a traditional program using six or more years.

1. Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, 2002-03 Edition, Biological and Medical Scientists, <http://www.bls.gov/oco/ocos047.htm>

2. National Science Board, "The Science and Engineering Workforce-Realizing America's Potential". National Science Foundation, 2003, NSB 03-69

3. United States Commission on National Security/21st Century, "Phase III Report: Roadmap for National Security: Imperative for Change", United States Department of Defense, 2001, (<http://www.nssg.gov/Reports/reports.htm>).

4. Center for Science, Mathematics and Engineering Education, National Research Council, "From Analysis to Action: Undergraduate Education in Science, Mathematics, Engineering and Technology. Report of a Convocation", 1996. National Academy Press, Washington, DC.

5. National Science and Technology Council, "Ensuring a Strong U.S. Scientific, Technical and Engineering Workforce in the 21st Century", 2000, (<http://www.usembassy.de/usa/etexts/bus/workforce.pdf>).

6. National Research Council, "How People Learn: Brain, Mind, Experience and School", Bransford, John D, Brown, Ann L. and Rodney R. Cocking, eds., 1999, National Academy Press, Washington, DC.

4.b. Impact

The impact of the proposed program is expected to be felt almost exclusively at the Departmental level. Implementation of the program will increase the volume of research conducted in the department and will increase productivity with respect to journal articles and presentations with student and faculty coauthors. Implementation of the program will keep our better students at IUP for an extra year and will increase interactions between students and faculty. If undergraduates from other institutions choose to transfer to IUP to take advantage of the Accelerated Track, there might be a significant increase in the size of our graduate program, but we do not expect this to be the case. We project the enrollment in the Accelerated Track to level off at about 6 students. Implementation of the proposed program will help build graduate culture in the Department. Finally, the proposed program will help to recruit better faculty.

We expect the proposed program to have little or no impact at the university, state or regional level.

5. Academic Integrity

5.a. Program requirements

5.a.i. Requirements for admission

The Accelerated Track may not be a practical option for all students. Nevertheless, undergraduate students enrolled in any of the Biology Department's four undergraduate degree programs (Bachelor of Arts in Biology, Bachelor of Science in Biology, Environmental Health Sciences, Biology Education) or tracks (Cell and Molecular Biology, Environmental Biology, Biology Honors, Pre-Medical, Pre-Veterinary) will be eligible to apply for admission to the Accelerated Track. Undergraduate students in related disciplines such as Biochemistry, Chemistry, Natural Sciences, Psychology or other disciplines will also be considered eligible to apply and their applications will be considered on a case-by-case basis. The traditional track may be a more realistic option for these students.

For admission to the accelerated track, students must:

- Have achieved junior-level status
- Identify a research mentor/thesis director and a thesis project
- Have earned an overall GPA of 3.0 or higher
- Apply to the program during their junior year.
- Submit a formal application to the Biology Department Graduate Coordinator to be reviewed by the Biology Department Graduate Committee, including three letters of recommendation, and a letter of commitment from the designated research mentor/thesis advisor.
- Submit an outline of proposed research written in collaboration with the designated research mentor/thesis advisor.

5.a.ii. Requirements for degree candidacy

For admission to degree candidacy, students must

- Satisfactorily complete 15 semester hours of graduate work,
- Select a thesis advisory committee of at least two faculty members in addition to the thesis advisor to guide the candidate in completing the program
- Submit to the Biology Department Graduate Committee an official application to candidacy, including a research proposal approved by the thesis advisor

Candidates are also expected to maintain a grade point average not lower than 3.0. Continuance in the graduate program for those receiving two individual course grades below a "B" is contingent upon favorable review of the Graduate Committee. Students in the

Accelerated Track must maintain an overall GPA of 3.0 in the undergraduate component of program as well as an overall GPA of 3.0 in the graduate component.

5.a.iii. Requirements for graduation

In order to successfully complete the proposed program students will earn 32 semester hours of credits according to the following divisions and will complete an original body of research described in a thesis under the direction of a thesis advisor and the guidance of a thesis advisory committee.

I. Core Courses (20 semester hours)

IA. Required Courses	11 s.h.
BIOL 602 Biometry	3 s.h.
BIOL 611 Biology Seminar I	1 s.h.
BIOL 612 Biology Seminar II	1 s.h.
BIOL 850 Thesis	6 s.h.
IB. Core Elective Requirement	9 s.h.

Nine semester hours of course credit selected from biology electives and must include one cell/molecular biology course, one organismal biology course and one ecology course

II. Elective Courses (12 semester hours)

Twelve semester hours of courses to be selected with the approval of the thesis advisor from the 500- and 600-level biology elective courses or from related science and mathematics courses

III. Competency Exam

Every student must take a competency exam administered by the candidate's thesis advisory committee. The purpose of this exam is to ensure that all graduates have a broad-based knowledge of biology, as well as a mastery of their subject matter directly or indirectly pertaining to their research project. This examination must be scheduled after the completion of 18 semester hours but before the completion of 27 semester hours. If a student fails this exam, a second exam will be administered which, at the discretion of the committee, can be oral or written. This exam must be taken within a four-month period following the first exam. Failure of the second exam will result in dismissal from the program.

IV. Research Requirement

The candidate must conduct original research under the direction of the thesis advisory committee and present a research thesis at the conclusion of the program. The candidate registers for BIOL 850 Thesis, while engaged in research and preparation of the thesis. The

candidate will present a public seminar, reporting results of the research, and an oral defense before the thesis committee.

5.a.iv. Requirements for graduation-bachelor's

The requirements for graduation with a bachelor's degree from the undergraduate component are not affected by enrollment in the proposed Accelerated Track.

5.b. Student progression by semester

A sample student progression through the proposed program is provided below. The sample progression illustrates a "worst-case scenario" in which the hypothetical student begins formal classwork for the Accelerated Track at the last possible moment-the beginning of the senior year-and therefore has a minimum time frame in which to complete the program requirements. This hypothetical student will also be enrolled in undergraduate courses during the senior year. The identity and number of these courses will vary from student to student. No undergraduate courses are shown in the sample progression, but a sample 5-year course sequence is presented in Appendix D. Students whose research project involves some aspect of field biology may find it necessary to conduct research activities during the summer between the junior and senior year. This is optional for other students, depending on the research plan. Students in the Accelerated Track may take graduate or undergraduate courses during the summer between the junior and senior year, but for clarity no undergraduate summer courses are shown in the sample progression.

Sample Student Progression Through Accelerated Track

Senior Year

Seventh Undergraduate Semester First Semester in Accelerated Track

BIOL 611 Graduate Seminar I 1 s.h.
BIOL ____ Graduate Biology Course 3 s.h.

Eighth Undergraduate Semester Second Semester in Accelerated Track

BIOL 612 Graduate Seminar II 1 s.h.
BIOL ____ Graduate Biology Course 3 s.h.

Summer

BIOL ____ Graduate Biology Courses 3-6 s.h.

Graduate Year

First Graduate Semester

Third Semester in Accelerated Track

BIOL 602 Biometry	3 s.h.
BIOL ___ Graduate Biology Courses	3 s.h.
BIOL 850 Thesis Research	<u>3 s.h.</u>

Second Graduate Semester

Fourth Semester in Accelerated Track

BIOL ___ Graduate Biology Course	6 s.h.
BIOL 850 Thesis Research	<u>3 s.h.</u>

Summer

BIOL ___ Graduate Biology Courses 3-6 s.h.

The catalog term for the proposed program will be "Master of Science in Biology-Accelerated Track"

A projected timeline for progression through the proposed program is shown below. The timeline outlines important milestones or events in the student's progression through the program but does not provide a detailed course sequence.

Projected Student Timeline-Accelerated Track

1) Freshman and sophomore years

Student takes undergraduate courses as usual. During the sophomore year the investigation of the Accelerated Track should begin.

2) Junior year-fall semester

Student identifies research mentor/thesis advisor and research project. Student submits application materials to the Biology Department Graduate Committee. Student is accepted to program.

3) Junior year-spring semester

Student forms thesis advisory committee and begins work on formal research proposal.

4) Summer between junior and senior year

Student may take courses or begin research if necessary.

5) Senior year

Student finishes remaining undergraduate courses. Students who enter IUP with Advanced Placement credit in the sciences will face fewer undergraduate requirements than

students who enter without AP credits. Student takes graduate courses and begins thesis research.

6) Summer between senior year and graduate year

Typical student receives bachelor's degree. Student conducts master's research. Student may take graduate classes if desired. Student is admitted to Biology Graduate Program.

7) Graduate year

Student finishes thesis research and course requirements. Student writes and defends thesis.

8) Summer following graduate year

Student finishes coursework or thesis and graduates with master's degree.

5.c. New and revised courses

The proposed program includes no new or revised courses. Several Biology course proposals are currently moving through the graduate approval process but these course proposals are independent of the Accelerated Track program proposal.

5.d. Faculty to be involved

5.d.i List of faculty

The following list contains the names of faculty who are currently members of the Biology Department and who will be involved in the Accelerated Track. In addition to these individuals, the Biology Department expects to fill several positions vacated by projected retirements over the next few years. We are currently searching for three full-time, tenure-track faculty and expect to search for approximately two additional faculty each year for the next 3-4 years.

List to be provided

5.d.i. Faculty summary sheets

Faculty Summary Sheets are included in Appendix E.

5.d.ii. Curriculum vitae

These are included as Appendix F in three copies of the proposal. Other copies of the proposal do not contain an Appendix F.

5.e. Explanation of difference between proposed program and existing programs at IUP

The proposed program is the first program at IUP to integrate the delivery of the bachelor's and master's degree into a single five-year program.

5.f. Letters of notification

Letters of notification and responses have been sent to the following Departments and Programs. Copies of the letters of notification and responses are included in Appendix G.

Biochemistry Program
Department of Chemistry
Department of Computer Science
Department of Geosciences
Department of Mathematics
Department of Physics
Department of Psychology
Natural Sciences Program
University-wide Undergraduate Curriculum Committee of the IUP Senate

5.g. Statement of CBA compliance

To the best of our knowledge the proposed program is in compliance with the CBA.

6. Coordination with Programs at Other Institutions

6.a. Duplicative programs

Of the thirteen SSHE institutions other than IUP, three institutions (Lock Haven, Mansfield and Slippery Rock) do not list Master of Science in Biology among their program offerings. The remaining ten (Bloomsburg, California, Cheyney, Clarion, East Stroudsburg, Edinboro, Kutztown, Millersville, Shippensburg and West Chester) do list the degree. None of these ten offer a combined B.S./M.S. or an accelerated M. S. such as the one described in this proposal.

6.b. Communications with other institutions as appropriate

None appropriate

7. Periodic Assessment

7.a. Periodic program evaluation outcomes assessment

7.a.i. Background

The goal of the proposed program is to prepare our best, most highly motivated undergraduate students for skilled technical positions in the industrial or academic workforce or for advanced study in graduate or professional school. With this goal in mind, we will assess the Accelerated Track using the following methodology and criteria.

7.a.ii. Methodology

We will gather five types of data for assessment of the proposed Accelerated Track using the following methods.

1. Each student who finishes the program will be required to complete an Outcome Survey prior to graduation.
2. The Biology Graduate Committee will monitor the number and quality of publications and presentations authored or coauthored by program students.
3. The Biology Graduate Committee will maintain a database of employers who hire graduates of the program. The Committee will maintain a similar database of graduate or professional schools that accept program graduates.
4. As an external component of the assessment, the Graduate Committee will conduct employer/graduate school satisfaction surveys.
5. The Graduate Committee will carry out transcript analysis for program graduates.

7.a.iii. Criteria

We will use the following criteria to evaluate the success of the program.

1. Some of the items on the Outcome Survey will address student satisfaction with the program and their opinion on whether the Accelerated Track met their learning objectives. Favorable responses on XX% or more of the survey items will constitute a successful result for the program.
2. Student presentation of data at a national/international conference by XX% of graduates or student authorship/coauthorship of a manuscript accepted for publication in a peer-reviewed journal by XX% of graduates will constitute a successful result for the program.

3. Professional employment within 12 months of graduation of XX% of students who seek positions in the workplace or placement within 12 months of graduation of XX% of students who seek admission to graduate/professional schools will constitute successful results for the program.

4. Based on the results of satisfaction surveys, favorable reports on the level of student preparation by XX% of employers or graduate/professional schools will constitute a successful result for the program.

5. The results of transcript analysis collectively indicate no consistent problem areas or weaknesses in the program.

7.a.iv. Feedback

The Graduate Committee of the Biology Department will share cumulative program assessment data (not individual student reports) with all graduate faculty in the Biology Department. The Committee will revise the program, seek course revisions or amend the governance of the program in response to problems or in response to lack of success based on the criteria described above.

7.b. Assessing student learning outcomes

7.b.i. Student Learning for the Program: Goals and Objectives:

The philosophy of the Biology Department is that the assessment of student learning has two fundamental purposes. The first purpose is to provide formative evaluation data so that individual learners can improve their performance in various aspects of the program and that faculty members can adjust course content or pedagogy. The second purpose is to provide summative evaluation data so that individual learners can measure their overall success in the curriculum and report that information to prospective employers, graduate schools or professional schools.

The objectives for student learning (a.k.a. performance objectives, intended student outcomes, intended educational outcomes) of the proposed program are three-fold and include a cognitive, an attitudinal and a behavioral component. First, students who complete the Accelerated Track will demonstrate sufficient knowledge in the specialized area of research to formulate, test and defend an original thesis (cognitive). Second, these students will also acquire sufficient breadth of knowledge in biology to provide an intellectual context for the research problem and to appreciate the diversity of modern biology as a discipline-in short, to think as a biologist thinks (attitudinal). Third, students will apply the scientific method (including technical skills) to the research problem as appropriate (behavioral). We will use this set of objectives as a guide in assessing student learning in the program and in providing both formative and summative feedback.

7.b.ii. Methodology

The assessment of student learning will take place at the following levels of the program. The methodology to be used at each level is described in the appropriate place in the text.

Level 1. Admission to Accelerated Program

The Biology Department Graduate Committee will review the applicant's performance in class work as reflected in grades in Biology classes and overall GPA. Course work in Biology and other science classes contains many types of embedded evaluations including integral laboratory components in most Biology courses.

The Biology Department Graduate Committee will review the applicant's letters of recommendation from faculty.

The prospective research advisor will review the applicant's potential for success in laboratory or field work and report to the Graduate Committee.

Feedback to the student from Level 1 assessment along with an admission decision will be provided within two weeks of the completion of the review.

Level 2. Admission to Biology Graduate Program

The Biology Department Graduate Committee will review the applicant's performance in class work as reflected in grades in Biology classes, including graduate classes taken since entering the program, and overall GPA.

The Biology Department Graduate Committee will review the applicant's letters of recommendation from faculty.

The Biology Department Graduate Committee will review the student's progress toward completion of the thesis research.

Feedback to the student from Level 2 assessment along with an admission decision will be provided within two weeks of the completion of the review.

Level 3. Admission to Degree Candidacy

The thesis advisor will review the thesis proposal and research plan as it is being developed by the student. Upon agreement by the thesis advisor, a written copy of the proposal will be submitted to the members of the thesis advisory committee.

The thesis advisory committee will review the written research proposal and an oral presentation of the proposal.

The thesis advisor will also monitor the student's ability to conduct research skills

Feedback to the student from Level 3 assessment will be provided by the thesis advisory committee immediately after the presentation of the proposal and by the thesis advisor on an ongoing, day-to-day basis.

Level 4. Competency Examination

The thesis advisory committee will conduct a comprehensive oral examination of the student.

Feedback to the student from Level 4 assessment will be provided by the thesis advisory committee immediately after the examination.

Level 5. Thesis Defense

The thesis advisor will review the thesis it is being written by the student. Upon agreement by the thesis advisor, a written copy of the proposal will be submitted to the members of the thesis advisory committee.

The thesis advisory committee will evaluate the student’s thesis and the student’s oral defense of the thesis.

Feedback to the student from Level 5 assessment will be provided by the thesis advisory committee immediately after the thesis defense and the review of the written thesis and by the thesis advisor on an ongoing, day-to-day basis.

Level 6. Assessment following graduation

The Graduate Committee will carry out post-graduation assessment by monitoring the number and quality of publications or presentations authored or coauthored by the student, and by conducting appropriate satisfaction surveys.

Feedback from post-graduate assessment of individual student performance will be shared with the thesis advisor and the thesis advisory committee.

7.b.iii. Alignment of Objectives and Assessment Methodologies

The table below aligns the Objectives described in Section 7.b.i with the Assessment Methodologies described in Section 7.b.ii.

Objective	Methodology Used to Assess
Demonstrate knowledge in research area	Graduate Committee review of credentials and GPA (Levels 1 and 2) Review of research proposal (Level 3) Competency Exam (Level 4) Thesis Defense (Level 5) Satisfaction Survey (Level 6)
Demonstrate breadth of knowledge in biology	Graduate Committee review of credentials and GPA (Levels 1 and 2) Preparation of research proposal (Level 3) Competency Exam (Level 4)
Apply scientific method and skills to a research problem	Graduate Committee and research advisor review of credentials and GPA (Levels 1 and 2) Preparation of research proposal (Level 3) Advisor’s review of research skills (Level 3) Thesis Defense (Level 5) Satisfaction Survey (Level 6)

8. Resource Sufficiency

8.a. Faculty workload

8.a.i. Description of strategy

The number of graduate courses offered in the Biology Department varies from semester to semester, but we usually offer a total of seven 500- and 600- level courses each semester, exclusive of the required courses BIOL 602, 611 and 612. Courses that include laboratory experiences at field sites such as streams, wetlands, marine sanctuaries, forests, arboreta or other habitats are usually scheduled in the Fall semester to take advantage of warmer weather.

Graduate classes in the Biology Department are offered on a two-year rotation schedule, making it possible for a student in the proposed Accelerated Track to enroll in any class during the two-year progression (senior year plus graduate year) through the Track. The required courses BIOL 602 Biometry and the two seminar courses BIOL 611 and 612 are offered annually. We usually offer one section of each graduate course and this will be adequate for the projected student population of the proposed track. We do not project any change in the number of graduate courses or their frequency of offering during the regular academic year with the implementation of the proposed program.

We expect substantial faculty turnover in Biology over the next few years as senior faculty retire and new faculty are hired. The new people will bring new expertise and will be expected to develop new courses for the graduate program. These new courses will be included in the course rotation as they are developed and approved. Assuming replacement of retired faculty, the number of faculty positions currently available should be adequate for the proposed program.

Additional faculty resources will be needed in the form of summer contracts to guarantee the offering of summer graduate courses for students in the Accelerated Track. Students in the traditional track or high school science teachers would also be able to enroll in these graduate courses. If a dual-listed course were scheduled during the summer, undergraduate students would be able to enroll in the undergraduate component of the course. For many field-based courses in biology, a summer offering is academically superior to an offering in the fall or the spring.

Students in the Accelerated Track may, as undergraduates, wish to initiate thesis work by enrolling in BIOL 482 Independent Study. Thus, additional faculty resources will also be needed in the form of salary support for faculty who direct these Independent Study projects.

8.a.ii. Faculty workload tables

Faculty workload tables are included in Appendix H.

8.b. Other resources

8.b.i. Learning resources

Learning resources currently available are adequate for the proposed program.

8.b.ii. Instructional equipment

Instructional equipment currently available is adequate for the proposed program.

8.b.iii. Facilities

Laboratory and other research facilities currently available are adequate for the proposed program.

8.b.iv. Library resources

Library resources currently available at IUP are inadequate for the proposed program. Students will travel to libraries at Pitt or Penn State to obtain materials unavailable from the IUP library or will obtain materials from faculty collections or will utilize Inter-Library Loan.

8.b.v. IDC

The currently-available resources of the IDC are adequate for the proposed program.

8.c. Budget Table

A summary Budget Table is shown in Appendix I.

9. Impact on educational opportunity

9.a. Plan for recruiting and retaining students from underrepresented groups

We anticipate that most of the students who choose to enroll in the Accelerated Track will come from among our own undergraduates. Thus, we will recruit primarily from this group. In general, the discipline of Biology enrolls more women than any other sciences except Psychology. At IUP, women constitute 61.8% of all Biology majors compared to a national average of about 55.4% (<http://www.nsf.gov/sbe/srs/seind02/>). Thus, women at IUP represent a natural target audience for this program.

For off-campus recruiting we will work through IUP Admissions Office and utilize their established channels of communication for making the BSMS program known to students from underrepresented groups. We will also advertise the program on the departmental web site.

9.b. Minority, women faculty in the program, recruitment for vacant positions

Of the XX faculty to be involved in the proposed program XX are either women or minorities. The Biology Department expects to fill several faculty positions vacated by retirement over the next few years. Official IUP affirmative action policies will be followed for the recruitment of faculty for replacement positions.

9.c. Inclusion of scholarship from underrepresented groups

The proposed program contains significant amount of scholarship from underrepresented groups, especially women. Examples include the following.

10. Catalog Description

to be added

11. Appendices

Appendix A. List of some five-year biology programs and web sites

- 1) Brigham Young University Department of Microbiology BS-MA in Microbiology (Integrated Program)
http://www.ar.byu.edu/dept_academ_advise/gemajor/97/mr/285163.html
- 2) Colorado State University Department of Biochemistry and Molecular Biology B.S./M.S. Combined Program
<http://www.bmb.colostate.edu/bsms.cfm>
- 3) Fairleigh-Dickinson University School of Natural Sciences B.S.-M.S. in Biology
<http://www.fduinfo.com/majors/ucns-bsms-bio.php3>
- 4) Iowa State University Department of Biochemistry, Biophysics and Molecular Biology Combined B.S./ M.S. Degree in Biochemistry
<http://www.bb.iastate.edu/students/undergrads/bsms.html>
- 5) Michigan State University Department of Microbiology and Molecular Genetics BS-MS 5-Year Combined Program
<http://www.msu.edu/unit/micdept/bsmsdetails.html>
- 6) Stanford University Department of Biological Sciences Coterminal Master of Sciences Degree Program
http://www.stanford.edu/dept/biology/programs_bsms.html
- 7) University of California at San Diego Division of Biological Sciences Integrated BS/MS Program
http://www-biology.ucsd.edu/undergrad/int_bsms.html
- 8) University of Connecticut Department of Ecology and Evolutionary Biology Joint B.S./ M.S. Degree Program in Biodiversity and Conservation Biology
<http://www.eeb.uconn.edu/grads/BSMSdescr.html>
- 9) University of Idaho Department of Microbiology, Molecular Biology and Biochemistry Seamless B.S./ M.S. Degree
http://www.ag.uidaho.edu/mmbb/undergrad_seamless.html
- 10) University of Massachusetts Amherst Neuroscience and Behavior Program Five-Year B.S./ M.S. Program
<http://www.umass.edu/neuro/5year/5year.html>

11) University of Rochester Biological Sciences:Neuroscience B.S./ M.S. Program in Neuroscience

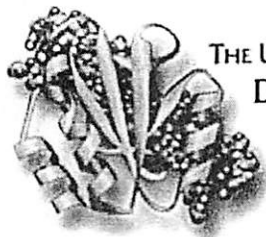
http://www.bcs.rochester.edu/neuro/NSC_MSprog.html

12) Villanova University Department of Biology Combined BS/MS Program

http://www.biology.villanova.edu/bsms/program_summary.html

Appendix B. Sample programs

- 1) University of Arizona Department of Biochemistry and Molecular Biophysics Five Year B.S./ M.S. Degree in Biochemistry
- 2) Michigan State University Department of Physiology BS/MS Combined Degree Program



THE UNIVERSITY OF ARIZONA.

Department of Biochemistry and Molecular Biophysics

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Five Year B.S./M.S. Degree in Biochemistry

The Department of Biochemistry & Molecular Biophysics now allows students to enroll in an accelerated program that leads to both the Bachelor of Science and Master of Science degrees. Our program follows the normal B.S. degree for three years, but adds two graduate courses during the Senior year. The fifth year includes three graduate courses, research credits, and the Masters Thesis.

Students who are interested in this B.S./M.S. program should meet with a member of the Advisory Committee as early as possible to plan for the course work and thesis. Students must select a mentor for their Senior Thesis and M.S. Thesis that is approved by the Advisory Committee. The Senior Thesis (or Honors Thesis) for the B.S. degree will represent preliminary work for the M.S. Thesis to be completed during the fifth year.

The Master of Science degree requires 30 units (minimum) of graduate work in 500-level courses or above, up to 15 of which may be in thesis research. At least one-half of the required units must be in courses offering regular letter grades. Up to 12 units of graduate credit earned as an undergraduate and not applied toward the baccalaureate degree can be applied for credit toward a master's degree. Required courses for the M.S. degree include Proteins and Enzymes 565 and two other courses from the [Course List](#). The student, with approval from the Advisory Committee, chooses the remaining graduate courses required for the degree.

[Application form](#)

For further information:

Dr. William Grimes, Professor
Biochemistry and Molecular & Cellular Biology
Biological Sciences West Bldg., Room 342
The University of Arizona, PO Box 210088
Tucson, AZ 85721-0088
wjgrimes@u.arizona.edu

Phone: (520) 621-5431

Olivia Mendoza, Program Coordinator
Department of Biochemistry & Molecular Biophysics
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Tucson, AZ 85721-0088
omendoza@u.arizona.edu

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Institute of Biomedical Science and Biotechnology

Biological Sciences West
P.O. Box 210088 · Tucson, AZ 85721-0088
Tel: (520) 621-9185 FAX (520) 621-9288
Department of Biochemistry and Molecular Biophysics
The University of Arizona
August 12, 2003

<http://www.biochem.arizona.edu/>
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richards@email.arizona.edu

B.S./M.S. Degree Course List

Genetics 545 - covers basic concepts of genetic analysis, primarily in Eukaryotes.

Proteins and Enzymes 565 - covers principles of protein structure and function, and the kinetics and mechanisms of enzyme action.

Nucleic Acids 568 - covers DNA replication and repair, transcription and RNA processing, translation, gene regulation, critical analysis of papers, and hypothesis-testing.

Cell Regulation 572 - covers how cells regulate and respond to external and internal environments.

Biological Structure 585 - covers approaches to the study of biomolecular structure.

B.S./M.S. Degree Program Five-Year Outline

Freshman Year

Math 124	5	Math 129	3
Engl 101	3	Engl 102	3
Chem 103a/104a	4	Chem 103b/104b	4
Tier 1	3	Tier 1	3
		Tier 1	3
	15		16

Sophomore Year

Bioc 181R/L	4	Bioc 182	4
Math 223	4	Chem 246/247b	5
Chem 246/247a	5	Tier 2	3
Tier 1	3	Tier 2	3
	16		15

Junior Year

Phys 131	4	Phys 132	4
Bioc 462a	4	Bioc 462b	4
Bioc 463a	4	Bioc 496a	1
Tier 2	3	Bioc 411	3
Elective	3	Elective	6
	18		18

Senior Year

--	--	--	--

Chem 480a	3	Chem 481	3
Bioc 498	3	Bioc 498	3
Elective	6	Elective	6
Grad course	3	Grad course	3
	15		15

Fifth Year

Grad course	6	Grad course	3
Bioc 599 Research	6	Bioc 599	6
		Bioc 910 Thesis	3
	12		12

Untitled Document

Application for the Five Year B.S./M.S. Degree in Biochemistry and Molecular Biophysics

Please fill in the application form and submit to Olivia A. Mendoza in Biological Sciences West 362B4.

Date of Application _____

Name _____

Address _____

Phone _____ E-Mail _____

1. Prepare, with your suggested thesis advisor, a 1-2 page summary of your proposed research. The summary should include:

- the hypothesis or overall goal
- the specific aims and how they will be tested including types of techniques to be used
- the expected outcomes
- how the expected data will be interpreted

Include the name of your proposed Thesis Director.

2. Include letters of reference from two members of the Faculty.

3. Please submit a printout of your academic record.



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The Physiology Department is affiliated with these other programs on campus:

- Cell and Molecular Biology Graduate Program
- Cell, Molecular and Structural Biology Program
- Genetics Program
- Neuroscience Program
- Pharmacology Training Grant
- M.D./Ph.D. Medical Scientist Training Program
- D.O./Ph.D. Medical Scientist Training Program

- Admission
 - Graduate School Application, plus application fee
 - Departmental questionnaire
 - TOEFL scores for international students from non-English speaking countries
 - The GRE is not required for the BS/MS program
 - Official transcript of grades from all schools attended after high school
 - Three letters of recommendation
- Curriculum

The BS/MS degree in Physiology offers a unique opportunity to MSU students for advanced training in Physiology. Students beginning in their junior year can enter a research laboratory and begin either a bench-based or library-based research project. The required graduate courses can begin after the student successfully completes PSL 431/432 and BCH 461/462. The student is advised to visit the Faculty Research site of this webpage to see the research opportunities in cell and molecular physiology at MSU.

University and departmental rules and regulations governing a BS/MS degree in Physiology:

- Students accepted into the dual degree program can be admitted to the BS and MS program as early as the beginning of their junior year.
- To be admitted to the dual degree program, the applicant must:
 - have a GPA of 3.0 or higher in all undergraduate course work
 - have a GPA of 3.0 or higher in all courses in the College of Natural Science
 - complete the Physiology Department application for graduate school (note: the GRE requirement is waived)
 - be accepted by the Physiology Department Graduate Admissions Committee
 - be encouraged to identify a prospective thesis advisor before submitting the application to the department
- The student must complete a total of 150 credits, 120 credits for the B.S. degree and 30 credits for the M.S. degree. Courses can't be double-counted. A minimum grade of 3.0 is required in all graduate courses.
- The requirement for the Graduate Record Examination is waived.
- The student pays undergraduate tuition for all credits (graduate or undergraduate) until the semester in which they reach their 121st credit. At that point the student will begin to pay graduate tuition.
- Students are not eligible for graduate assistantships until the semester in which they enroll for their 121st credit. However, students involved in research in their mentor's laboratory can negotiate an hourly wage.
- The student must:
 - complete a graduate application
 - obtain a letter of support from the Department of Physiology stating that they are accepting the student as a BS/MS candidate
 - submit the application along with the letter from the department and the appropriate application fee to Dr. Douglas Estrly, Associate Dean, College of Natural Science
 - A letter of support from the College of Natural Science is attached along with a tracking code. The whole packet is submitted to the Registrar's Office. Soon a list of courses that will apply to the graduate degree are submitted to the Department/College/University.
- Course Work (in addition to thesis research) - Same course/thesis requirements as for the M.S. degree.

BS/MS Program Timetable

Students beginning in their junior year can enter a research laboratory and begin either a bench-based or library-based research project. The required graduate courses can begin after the student successfully completes PSL 431/432 and BCH 461/462

University and departmental rules and regulations governing a BS/MS degree in Physiology:

- The student must complete a total of 150 credits, 120 credits for the B.S. degree and 30 credits for the M.S. degree. Courses can't be double-counted. A minimum grade of 3.0 is required in all graduate courses.
- The student pays undergraduate tuition for all credits (graduate or undergraduate) until the semester in which they reach their 121st credit. At that point the student will begin to pay graduate tuition.
- Students are not eligible for graduate assistantships until the semester in which they enroll for their 121st credit. However, students involved in research in their mentor's laboratory can negotiate an hourly wage.

Course	Credits
PSL 827: Physiology/Pharmacology of Excitable Cells	4
PSL 282: Cellular/Integrative Physiology	4
BCH 801: Molecular Biology and Protein Structure	3
BCH 802: Metabolic Regulation and Signal Transduction	3
PSL 910: Cellular and Molecular Physiology	4
PSL 950: Topics in Physiology (4 semesters @ 1cr./semester)	4
PSL 899: Master's Thesis Research	9
	Total: 30

Fall Semester - Yr. 1

Course	Credits	Days	Time	Location
BMB 801: Molecular Biology	3	M W F	9:10-10:00	1415 BPS
PSL 827: Physiol./Pharmacol. of Excitable Cells	4	M W F	10:10-11:30	B448 Life Sci.
PSL 950: Topics on Physiology **	1	W	12:00-1:00	3280 BPS
PSL 899: Master's Thesis Research	1-3			

Spring Semester - Yr. 1*

Course	Credits	Days	Time	Location
PSL 828: Cellular and Integrative Physiology	4	M W F	8:00-9:30	BCM 114
BMB 802: Metabolic Reg./Signal Transduction	3	M W F	10:20-11:10	223 Nat. Res.
PSL 950: Topics in Physiology	1	W	12:00-1:00	3280 BPS
PSL 899: Master's Thesis Research	1-3			

* - Times/location based on Spring 2003 information

** - PSL 950 is not required first semester in Program

Fall Semester - Yr. 2

Course	Credits	Days	Time	Location
PSL 910: Cellular and Molecular Physiology	4	M W	3:00-4:50	2240C BPS
PSL 950: Topics in Physiology	1	W	12:00-1:00	3280 BPS
PSL 899: Master's Thesis Research	1-3			

Spring Semester - Yr. 2*

Course	Credits	Days	Time	Location
PSL 950: Topics in Physiology	1	W	12:00-1:00	3280 BPS
PSL 899: Master's Thesis Research	1-3			

* - Times/location based on Spring 2003 information

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Graduate Programs > BS/MS Program Student Information

Please select the option that applies to your academic status and provide the requested information. Sign & date this form and return it along with your letter of acceptance, Graduate School application and check for the graduate application fees to 103 Natural Science.

Students pursuing a single undergraduate degree:

Students in the BS/MS program are considered undergraduates and therefore pay undergraduate tuition rates even for graduate credits up to, and including, the first 120 credits.

Financial Responsibilities:

During the semester in which the student has a "mixed" enrollment of credits (some below 120 and some above), the student will be coded as an undergraduate. This coding arrangement is for purposes of qualification for federal financial aid. For those credits over 120, you will be billed for the difference between undergraduate and graduate tuition.

Following the semester in which the student completes the 120th credit, the primary level is changed to graduate to allow the student to be eligible for a Graduate Assistantship in units that grant them to BS/MS students. For students receiving graduate assistantships, the tuition waiver will apply only to credits greater than 120.

Students pursuing two undergraduate degrees:

Students in the BS/MS program who are enrolled for two undergraduate degrees are considered undergraduate until they have reached 150 credits. They will need an additional 30 credits for the MS and courses cannot be double counted.

Financial Responsibilities:

During the semester in which the student has a "mixed" enrollment of credits (some below 150 and some above), the student will be coded as an undergraduate. This coding arrangement is for purposes of qualification for federal financial aid. For those credits over 150, you will be billed for the difference between undergraduate and graduate tuition.

Following the semester in which the student completes the 150th credit, the primary level is changed to graduate to allow the student to be eligible for a Graduate Assistantship in units that grant them to BS/MS students. For students receiving graduate assistantships, the tuition waiver will apply only to credits greater than 150.

Students pursuing an additional undergraduate major:

Students in the BS/MS program who are pursuing an additional undergraduate major may require credits beyond 120 to complete that major.

Financial Responsibilities:

During the semester in which the student has a "mixed" enrollment of credits (some below 120 plus the variable amount required for an additional major, and some above), the student will be coded as an undergraduate. This coding arrangement is for purposes of qualification for federal financial aid. For those credits over 120 plus the variable amount required for an additional major, you will be billed for the difference between undergraduate and graduate tuition.

Following the semester in which the student completes the 120 plus the variable amount required for an additional major, their primary level is changed to graduate to allow the student to be eligible for a Graduate Assistantship. For students receiving graduate assistantships, the tuition waiver will only apply to credits greater than 120 plus the variable amount required for an

additional major.

A copy of your MS Plan of Study must be submitted to the Registrar's Office & the Dean's Office by the first semester in which you enroll in graduate applicable credits. The Registrar keeps a separate record of the student's BS and MS Programs. The purpose of this is based on the fact that students are held to different academic standards for their BS and MS Programs.

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- Neuroscience Program
- Pharmacology Training Grant
- M.D./Ph.D. Medical Scientist Training Program
- D.O./Ph.D. Medical Scientist Training Program

Graduate Programs > Guidelines for students interested in a BS/MS Program in CNS

Students should be interested in pursuing a dual degree within Departments in the College of Natural Science.

The BS and the MS do not have to be from the same Department although in most cases they are.

Students who are being considered for a dual degree program should have approval for admission from the department to the respective graduate program and a minimum GPA (overall and in CNS courses) of 3.0 (**Students must have completed a minimum of 60 undergraduate credits.**). The department/program should submit the following packet to the Office of the Associate Dean for Student and Academic Affairs:

- A memorandum indicating that the department/program is willing to accept the student into the dual degree program
- A completed MSU graduate application
- A check for the application fee
- A completed and signed "Student Information Form for the BS/MS Program."

Upon approval of the packet, the Assoc. Dean's office will enter the BS/MS tracking code and forward the completed application packet to the Office of Admissions. This will authorize Admissions to process the application even if the student is only entering his/her junior year.

Students must submit their MS Plan of Study to the Registrar's Office and the Dean's office for Student and Academic Affairs by the first semester in which they enroll for graduate applicable credits. The Registrar keeps a separate record of the student's BS and MS Programs. The purpose of this is based on the fact that students are held to different academic standards for their BS and MS Programs.

Credits cannot be used to count toward both degrees.

For financial purposes, students in the BS/MS program are considered undergraduates and therefore pay undergraduate tuition rates even for graduate credits up to, and including, the first 120 credits.

Following the semester in which the student completes the 120th credit, the primary level is changed from UN to GR to allow the student to be eligible for a Graduate Assistantship. During a semester in which a student has a "mixed" enrollment of credits (some below 120 and some above) for the bachelor's degree and the master's degree, the student will be coded as an undergraduate.

For students receiving graduate assistantships, the tuition waiver will only apply to credits greater than 120.

Students in the BS/MS program cannot receive a graduate assistantship until the semester in which they are coded GR.

Students enrolled for two undergraduate degrees are considered undergraduate until they have reached 150 credits. They will need an additional 30 credits for the MS and courses cannot be double counted. Students pursuing a second major are considered undergraduate until they reach 120 credits plus additional credits, if any, that would reasonable be required for them to complete the second major. Documentation of the additional credits should be on file in the Dean's office.

Students may not receive their MS until all requirements for the BS have been completed.

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Appendix C. Descriptions of Biology graduate courses

C1. Courses appearing in the Graduate Catalog

BIOL 525 Herpetology 3 cr.

A comprehensive survey of the classes of Amphibia and Reptilia, including their classification, structure, origin, evolution, phylogenetic relationships, distribution, and natural history. Special emphasis is placed on the herpetofauna of Pennsylvania.

BIOL 550 Pymatuning: Field Studies 3 cr.

During the summer session, various field courses are offered through the Pymatuning Laboratory of Ecology. The offerings will vary depending on the summer. Some of the possible offerings include Experimental Design, Fish Ecology, Behavioral Ecology, Aquatic Botany, and Ecological Genetics. Information regarding specific offerings is available from the Biology Department in spring.

BIOL 563 Limnology 3 cr.

An investigation into the physical, chemical, and biological aspects of inland waters and their interrelationships. Saturday or Sunday labs may be required. **Prerequisite:** Ecology.

BIOL 564 Immunology 3 cr.

Study of anatomy and function of immune system, physical and chemical properties of antigens and antibodies, nature of antigen-antibody interactions, humoral and cell mediated immune responses, and immunopathology. **Prerequisites:** Biochemistry and Microbiology.

BIOL 566 Principles of Virology 3 cr.

Topics include structure, classification, assay, and transmission of animal, bacterial, and plant viruses; methods used in the study of viruses; viral replication, gene expression and gene regulation; host-viral interactions and sub-viral pathogens.

BIOL 575 Mammalogy 3 cr.

General discussion of mammals, emphasizing systematics, distribution, and structure-function modifications related to their evolution. A paper is required.

BIOL 576 Parasitology 3 cr.

The parasitic protozoa, flatworms and roundworms. Major emphasis is on species infesting man and includes their structure, physiology, ecology, life cycles, and pathogenicity.

Arthropods involved in parasite transmission included. **Prerequisites:** One year Biology, Vertebrate and Invertebrate Zoology.

BIOL 602 Biometry 3 cr.

The choice and application of standard, efficient, practical, and appropriate statistical techniques for data analyses in common biological situations. Computer instruction will emphasize the practical application of statistical techniques using statistical packages on microcomputers and the IUP mainframe computer. Lecture and computer instruction will be combined in four class hours per week.

BIOL 603 Advanced Techniques in Biology 1-3 cr.

Introduction to advanced techniques and procedures used in biological research. Topics vary. **Prerequisite:** Permission.

BIOL 611 Biology Seminar I 1 cr.

Develops essential skills for the professional biologist, including public presentation of biological information and the ability to critique biological data and ideas.

BIOL 612 Biology Seminar II 1 cr.

Develops essential skills for the professional biologist, including writing of research proposals and presentation of seminars. **Prerequisite:** BIOL 611.

BIOL 622 Advanced Ornithology 3 cr.

A detailed study of bird populations, behavior, and movement, including the annual cycle. **Prerequisite:** Ability to identify local birds visually and by their songs.

BIOL 623 Animal Morphogenesis 3 cr.

Factors that influence and control the differentiation of organs, tissues, and cells. Emphasis placed on experimental procedures and methods. **Prerequisites:** Embryology or Comparative Anatomy, Organic Chemistry, and Genetics.

BIOL 624 Advanced Entomology 3 cr.

Insect morphology, including external and internal organization of different species of insects. Comparisons between species included. An independent research study and seminar presentation required.

BIOL 631 Plant Ecology 3 cr.

Nature and distribution of vegetation in relation to environmental factors. Field investigations of local plant communities constitute bulk of lab work. **Prerequisites:** Field Botany, Plant Taxonomy, or general knowledge of local flora.

BIOL 641 Population and Community Ecology 3 cr.

The ecology of animal and plant populations, including the study of life tables and demography, population growth and regulation, and the evolution of life history traits. Community ecology considers the interactions among populations such as competition, predation, and mutualism, and how such interactions control the composition of a community. **Prerequisite:** Introductory course in ecology or permission of instructor.

BIOL 645 Behavioral Ecology 3 cr.

A consideration of the behavioral activities of animals in their natural habitats. Evolutionary and ecological implications of behavior will be stressed. Topics include natural history strategies, resource partitioning, reproduction strategies, sexual selection, cooperation, conflict, and social organization.

BIOL 651 Physiological Ecology of Animals 3 cr.

A consideration of physiological responses of animals to environmental variables with emphasis on the evolutionary aspects of the response. The physiology of invertebrates and vertebrates in aquatic and terrestrial environments will be considered. **Prerequisite:** A course in physiology or permission of the instructor.

BIOL 653 Animal Physiology 4 cr.

Digestion and molecular transport of nutrients, gaseous exchanges, excretion, muscular activity and control, and endocrine and neural elements. **Prerequisite:** Animal Biology.

BIOL 662 Molecular Genetics of Eukaryotes 3 cr.

Study of organization and chemical structure of genes in relation to molecular function and evolution. Emphasis will be placed on the genetic systems of eukaryotes and their viruses. **Prerequisites:** Genetics, Organic Chemistry, and Biochemistry or permission of the instructor.

BIOL 681 Special Topics 1-3 cr.

Advanced topics in biology. **Prerequisite:** Permission of instructor.

BIOL 699 Independent Studies 1-3 cr.

Individual or small group instruction, by tutorial and intensive literature survey, in a particular area not covered by a student's course work or thesis research. By arrangement with instructor and approval of graduate director. Maximum of six hours to be used toward the degree.

BIOL 850 Thesis 2-6 cr.

NOTE: Summer courses offered at the Pymatuning Laboratory of Ecology may be taken for biology elective credit.

C2. Courses in the approval process

BIOL 505 Biology of the Cell
BIOL 555 Animal Behavior
BIOL 556 Ecological Toxicology
BIOL 560 Environmental Epidemiology
BIOL 571 Dendrology of the Eastern U. S.
BIOL 577 Neurobiology
BIOL 590 Field Studies in Biology

Appendix D. Five-year student progression

One Possible Five-year Student Progression Through the Proposed B.S. in Biology and M.S. in Biology-Accelerated Track

First Semester

BIOL 111	Principles of Biology I	4
CHEM 111	General Chemistry I	4
HPED143/FN 143	Health & Wellness ¹	3

Second Semester

BIOL 112	Principles of Biology II	4
CHEM 112	General Chemistry II	4

Two courses each semester from the following (depending on assignment):

ENGL 101	College Writing <u>or</u>	4
	Social Science Elective ² <u>or</u>	3
HIST 195	The Modern Era	3

Choice of only one from:		
ART 101	Intro. to Art <u>or</u>	3
MUSC 101	Intro. to Music <u>or</u>	
THTR 101	Intro. to Theater <u>or</u>	
THTR 102	Intro. to Dance	

Total Credits Freshman Year - 29

Third Semester

BIOL ____	Botany or Zoo or Micro	3
CHEM 231	Organic Chemistry I	4
MATH 121	Calc. I (Nat. & Soc. Sci.) ³	4
____	Foreign Language ⁴	<u>3</u>
BIOL ____	Biology Elective	<u>3</u>
		17

Fourth Semester

BIOL ____	Botany or Zoo or Micro	3
CHEM 232	Organic Chemistry I	4
MATH 122	Calc. I (Nat. & Soc. Sci.) <u>or</u>	
MATH 216	Prob.&St./Nat.Sci.	4
BIOL ____	Biology Elective	3
____	Foreign Language <u>or</u>	
____	Liberal Studies Elective	<u>3</u>
		17

Fifth Semester

CHEM 351	Biochemistry	4
BIOL 263	Genetics (W)	3
BIOL ____	Biology Elective	3
PHYS 111	Physics I	3
PHYS 121	Physics I Lab	1
ENGL 202	Research Writing	<u>3</u>
		17

Sixth Semester

BIOL ____	Botany or Zoo or Micro	3
PHYS 112	Physics II	3
PHYS 122	Physics II Lab	1
____	Soc. Sci Elective ²	3
____	Hum: Phil/Rel.St.	3
BIOL ____	Biology Elective	<u>3</u>
		16

Seventh Semester

BIOL ____	Biology Elective	3
____	Soc. Sci. elective ³	3
____	Free Elective	3
____	Hum: Lit.	3
BIOL 611	Graduate Seminar I	1
BIOL ____	Graduate Elective	<u>3</u>
		16

Eighth Semester

BIOL ____	Graduate Biology Elective	3
LBST 499	Synthesis	3
BIOL 612	Graduate Seminar II	1
____	Liberal Studies Elect. (W)	<u>3</u>
BIOL ____	Biology Elective	3
		13

Summer

BIOL ____ Graduate Biology Courses 3-6 s.h.

Ninth Semester

BIOL 602 Biometry 3
BIOL ___ Graduate Biology electives 3
BIOL 850 Thesis Research 3

3
3
3
9

Tenth Semester

BIOL ___ Graduate Biology Electives 6
BIOL 850 Thesis Research 3

6
3
9

Summer

BIOL ___ Graduate Biology Courses 3-6 s.h.

Appendix E. Letters of Notification and Responses

To be added

Appendix F. Faculty Summary Sheets

To be added

Appendix G. Curriculum vitae

To be added

Appendix H. Faculty workload tables

H1. Program Startup Year:

FACULTY		PROJECTED BIOLOGY DEPARTMENT FACULTY ALLOCATION, 2005-2006 (by number of hours taught)												GRADUATE						
		Load for Dual-listed Courses Divided Equally Between Major and Masters Categories												UNDERGRADUATE						
		Liberal Studies		Service Courses		Major		Secondary Education		Branch Campuses		Masters Level		Doctoral Level		TOTALS				
F	S	F	S	F	S	F	S	F	S	F	S	F	S	F	S	F	S			
Andrew, Allan (1)	0	0	1	0	0	2.5	0	0	0	0	0	0	0	0	2.5	0	0	0	1	5
Avery, Leanne (2)	0	0	6	4	0	0	2	2	0	0	0	0	0	0	0	0	0	0	8	6
Ayebo, Amadu	0	0	5	0	7	10.5	0	0	0	0	0	0	0	0	1.5	0	0	0	12	12
Bharathan, N. (1, 3)	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0
Brenneman, W.	3	6	0	0	6.5	6	0	0	0	0	0	0	0	0	2.5	0	0	0	12	12
Browe, Andy	0	0	10	11	1.5	0	0	0	0	0	0	0	0	0	1.5	0	0	0	13	11
Butler, Barkley (4)	0	3	12	6	0	3	0	0	0	0	0	0	0	0	0	0	0	0	12	12
Ciskowski, Garry	0	0	12	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	12
Gendron, Rob	11	0	0	0	0	9.5	0	0	0	0	0	0	0	0	1	2.5	0	0	12	12
Hinrichsen, Bob	0	0	0	0	8	10.5	0	0	0	0	0	0	0	0	3	2.5	0	0	11	13
Hulse, Art	3	0	0	0	9	9.5	0	0	0	0	0	0	0	0	0	2.5	0	0	12	12
Jack, Martha	12	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	12
Kesner, Mike	0	0	12	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	12
Linzey, Alicia (5)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lord, Tom	3	8	0	0	2.5	0	4	4	0	0	0	0	0	0	2.5	0	0	0	12	12
Luciano, Carl (6)	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	3	3

PROJECTED BIOLOGY DEPARTMENT FACULTY ALLOCATION, 2005-2006

(by number of hours taught) F = Fall S = Spring

Load for Dual-listed Courses Divided Equally Between Major and Masters Categories

FACULTY	UNDERGRADUATE												GRADUATE						TOTALS		
	Liberal Studies		Service Courses		Major		Secondary Education		Branch Campuses		Masters Level		Doctoral Level		F	S	S				
	F	S	F	S	F	S	F	S	F	S	F	S	F	S							
Newell, Sandy (4)	12	6	0	6	0	0	0	0	0	0	0	0	0	0	0	0	12	12			
Peard, Terry (7)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Peterson, Russell	7	3	0	9	5	0	0	0	0	0	0	0	0	0	0	0	12	12			
Pistole, David	0	3	0	9	12	0	0	0	0	0	0	0	0	0	0	0	12	12			
Simmons, Tom (8)	2	2	2	2	5	5	0	0	0	0	0	0	0	0	0	0	9	9			
Winstead, Ray	8	7	0	0	0	0	0	0	0	0	0	0	0	4	5	0	11	13			
TBA 1 (9)	0	0	6	6	6	3	0	0	0	0	0	0	0	0	3	0	12	12			
TBA 2 (10)	0	0	0	0	12	12	0	0	0	0	0	0	0	0	0	0	12	12			
TBA 3 (11)	6	6	0	6	3	0	0	0	0	0	0	0	0	3	0	0	12	12			
TBA 4 (12)	0	0	12	12	0	0	0	0	0	0	0	0	0	0	0	0	12	12			
TBA 5 (13)	6	3	6	6	0	0	0	0	0	0	0	0	0	0	3	0	12	12			
TBA 6 (14)	0	0	0	0	0	0	0	0	9	9	0	0	0	0	0	0	9	9			
TBA 7 (15)	0	0	9	12	0	0	0	0	0	0	0	0	0	3	0	0	12	12			
TBA 8 (16)	0	0	0	0	0	0	0	0	7	7	0	0	0	0	0	0	7	7			
TBA 9 (17)	0	0	12	0	0	9	0	0	0	0	0	0	0	0	3	0	12	12			
TBA 10 (18)	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5			
TOTALS	78	64	105	113	86.5	83.5	6	6	16	16	20.5	25.5	0	0	321	0	309				

- (1) Includes 9 contact hours each semester released to Homeland Security Programs. Dr. Andrew's teaching assignment for these programs will likely include graduate-level SDR courses. Recognizing (1) that the Homeland Security projects are likely to continue on a long-term basis, (2) many of the specialized Biology courses normally taught by Dr. Andrew can not be offered while he is assigned to Homeland Security projects, (3) that no other permanent faculty at IUP possesses the expertise to teach these specialty courses and (4) that it is unreasonable to expect temporary faculty to teach these specialty courses, IUP agreed in October, 2003 to provide a permanent, full-time, tenure track replacement for Dr. Andrew (and Dr. N. Bharathan) even though these two individuals remain on staff at IUP. These two replacements are shown in this Table as TBA 1 and TBA 2. The Biology Department is currently conducting a national search for TBA 1 and TBA 2 with a Fall, 2004 start date. Under this arrangement, the Biology Department expects the full-time services of TBA 1 and TBA 2 as well as the ¼-time services of Drs. Andrew and Bharathan (6 contact hours each per academic year) for Departmental teaching. The balance of Dr. Andrew's and Dr. Bharathan's time is to be released to various Homeland Security projects as arranged by Dr. Eddy. In order to accurately reflect their Departmental assignments for this Workload Table, I have shown only 6 contact hours of Departmental teaching for Drs. Andrew and Bharathan. Dr. Andrew's projected teaching assignments will be in microbiology or immunology courses and may include BIOL 364/564 Immunology during the period covered by these workload tables.
- (2) Includes projected 5 contact hour release per semester for CETP Project
- (3) Dr. Bharathan is not projected to teach graduate BIOL courses during the period covered by these workload tables.
- (4) Includes 6 contact hours for teaching Honors Core
- (5) Includes projected full-time release as Interim Graduate Dean
- (6) Includes 9 contact hour release per semester as Department Chair
- (7) Includes full-time release as CETP-PA Director and Biology Education Coordinator
- (8) Includes 3 contact hour release per semester as Assistant Department Chair
- (9) Permanent replacement for Dr. Andrew as described in (1)
- (10) Permanent replacement for Dr. Bharathan as described in (1)
- (11) Permanent replacement for Dr. Nastase who retired in June, 2003, currently searching
- (12) Temporary replacement for Dr. Linzey
- (13) Permanent replacement for Dr. Humphreys, retired as of January, 2004
- (14) Temporary replacement for Dr. Peard, 9 contact hours per semester
- (15) Permanent replacement for Dr. Dietrich, projected to retire in January, 2005
- (16) Armstrong complement
- (17) Permanent replacement for Dr. Pickering, projected to retire in May, 2004
- (18) Temporary replacement for Dr. Avery, 5 contact hours per semester

H1. Program Year Two:

PROJECTED BIOLOGY DEPARTMENT FACULTY ALLOCATION, 2006-2007

(by number of hours taught)

F = Fall S = Spring

Load for Dual-listed Courses Divided Equally Between Major and Masters Categories

FACULTY	UNDERGRADUATE												GRADUATE						TOTALS	
	Liberal Studies		Service Courses		Major		Secondary Education		Branch Campuses		Masters Level		Doctoral Level		F	S				
	F	S	F	S	F	S	F	S	F	S	F	S	F	S						
Andrew, Allan (1)	0	0	1	0	0	2.5	0	0	0	0	0	0	2.5	0	0	0	1	5		
Avery, Leanne (2)	0	0	6	4	0	0	2	2	0	0	0	0	0	0	0	0	8	6		
Ayebo, Amadu	0	0	5	0	7	10.5	0	0	0	0	0	0	0	1.5	0	0	12	12		
Bharathan, N. (1, 3)	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	6	0		
Brenneman, W.	3	6	0	0	6.5	6	0	0	0	0	0	0	2.5	0	0	0	12	12		
Browe, Andy	0	0	10	11	1.5	0	0	0	0	0	0	0	1.5	0	0	0	13	11		
Butler, Barkley (4)	0	3	12	6	0	3	0	0	0	0	0	0	0	0	0	0	12	12		
Ciskowski, Garry	0	0	12	12	0	0	0	0	0	0	0	0	0	0	0	0	12	12		
Gendron, Rob	11	0	0	0	0	9.5	0	0	0	0	0	0	1	2.5	0	0	12	12		
Hinrichsen, Bob	0	0	0	0	8	10.5	0	0	0	0	0	0	3	2.5	0	0	11	13		
Hulse, Art	3	0	0	0	9	9.5	0	0	0	0	0	0	0	2.5	0	0	12	12		
Jack, Martha	12	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	12		
Kesner, Mike	0	0	12	12	0	0	0	0	0	0	0	0	0	0	0	0	12	12		
Linzey, Alicia (5)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Lord, Tom	3	8	0	0	2.5	0	4	4	0	0	0	0	2.5	0	0	0	12	12		
Luciano, Carl (6)	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	3	3		

PROJECTED BIOLOGY DEPARTMENT FACULTY ALLOCATION, 2005-2006

(by number of hours taught) F = Fall S = Spring

Load for Dual-listed Courses Divided Equally Between Major and Masters Categories

FACULTY	UNDERGRADUATE										GRADUATE						TOTALS	
	Liberal Studies		Service Courses		Major		Secondary Education		Branch Campuses		Masters Level		Doctoral Level		F	S		
	F	S	F	S	F	S	F	S	F	S	F	S	F	S				
Newell, Sandy (4)	12	6	0	6	0	0	0	0	0	0	0	0	0	0	12	12		
Peard, Terry (7)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Peterson, Russell	7	3	0	9	5	0	0	0	0	0	0	0	0	0	12	12		
Pistole, David	0	3	0	9	12	0	0	0	0	0	0	0	0	0	12	12		
Simmons, Tom (8)	2	2	2	2	5	5	0	0	0	0	0	0	0	0	9	9		
Winstead, Ray	8	7	0	0	0	0	0	0	0	0	4	5	0	0	11	13		
TBA 1 (9)	0	0	6	6	6	3	0	0	0	0	0	3	0	0	12	12		
TBA 2 (10)	0	0	0	0	12	12	0	0	0	0	0	0	0	0	12	12		
TBA 3 (11)	6	6	0	6	3	0	0	0	0	0	3	0	0	0	12	12		
TBA 4 (12)	0	0	12	12	0	0	0	0	0	0	0	0	0	0	12	12		
TBA 5 (13)	6	3	6	6	0	0	0	0	0	0	0	3	0	0	12	12		
TBA 6 (14)	0	0	0	0	0	0	0	0	9	9	0	0	0	0	9	9		
TBA 7 (15)	0	0	9	12	0	0	0	0	0	0	3	0	0	0	12	12		
TBA 8 (16)	0	0	0	0	0	0	0	0	7	7	0	0	0	0	7	7		
TBA 9 (17)	0	0	12	0	0	9	0	0	0	0	0	0	3	0	12	12		
TBA 10 (18)	5	5	0	0	0	0	0	0	0	0	0	0	0	0	5	5		
TOTALS	78	64	105	113	86.5	83.5	6	6	16	16	20.5	25.5	0	0	321	309		

- (1) Includes 9 contact hours each semester released to Homeland Security Programs. Dr. Andrew's teaching assignment for these programs will likely include graduate-level SDR courses. Recognizing (1) that the Homeland Security projects are likely to continue on a long-term basis, (2) many of the specialized Biology courses normally taught by Dr. Andrew can not be offered while he is assigned to Homeland Security projects, (3) that no other permanent faculty at IUP possesses the expertise to teach these specialty courses and (4) that it is unreasonable to expect temporary faculty to teach these specialty courses, IUP agreed in October, 2003 to provide a permanent, full-time, tenure track replacement for Dr. Andrew (and Dr. N. Bharathan) even though these two individuals remain on staff at IUP. These two replacements are shown in this Table as TBA 1 and TBA 2. The Biology Department is currently conducting a national search for TBA 1 and TBA 2 with a Fall, 2004 start date. Under this arrangement, the Biology Department expects the full-time services of TBA 1 and TBA 2 as well as the 1/4-time services of Drs. Andrew and Bharathan (6 contact hours each per academic year) for Departmental teaching. The balance of Dr. Andrew's and Dr. Bharathan's time is to be released to various Homeland Security projects as arranged by Dr. Eddy. In order to accurately reflect their Departmental assignments for this Workload Table, I have shown only 6 contact hours of Departmental teaching for Drs. Andrew and Bharathan. Dr. Andrew's projected teaching assignments will be in microbiology or immunology courses and may include BIOL 364/564 Immunology during the period covered by these workload tables.
- (2) Includes projected 5 contact hour release per semester for CETP Project
- (3) Dr. Bharathan is not projected to teach graduate BIOL courses during the period covered by these workload tables.
- (4) Includes 6 contact hours for teaching Honors Core
- (5) Includes projected full-time release as Interim Graduate Dean
- (6) Includes 9 contact hour release per semester as Department Chair
- (7) Includes full-time release as CETP-PA Director and Biology Education Coordinator
- (8) Includes 3 contact hour release per semester as Assistant Department Chair
- (9) Permanent replacement for Dr. Andrew as described in (1)
- (10) Permanent replacement for Dr. Bharathan as described in (1)
- (11) Permanent replacement for Dr. Nastase who retired in June, 2003, currently searching
- (12) Temporary replacement for Dr. Linzey
- (13) Permanent replacement for Dr. Humphreys, retired as of January, 2004
- (14) Temporary replacement for Dr. Peard, 9 contact hours per semester
- (15) Permanent replacement for Dr. Dietrich, projected to retire in January, 2005
- (16) Armstrong complement
- (17) Permanent replacement for Dr. Pickering, projected to retire in May, 2004
- (18) Temporary replacement for Dr. Avery, 5 contact hours per semester

Appendix I. Summary Budget Table

Estimated Costs	YEAR			
	Start-up 2005-2006	2 nd year 2006-2007	3 rd year 2007-2008	4 th year 2008-2009
Faculty (Salary & Fringe)	Ind. Study	Ind. Study	Ind. Study	Ind. Study
Staff (Salary & Fringe)	0	0	0	0
Instructional Equipment	0	0	0	0
Summer Contracts*	2 classes	2 classes	2 classes	2 classes
Library	0	0	0	0
Travel	0	0	0	0
Supplies and Materials	0	0	0	0
Other	Waiver	Waiver	Reduction	Reduction
Tuition Reductions or Waivers*				
Total				

Students enrolled in the accelerated track pay undergraduate tuition rate through their senior year (including summer). Graduate courses taken for graduate credit during this period are charged at the undergraduate rate as part of the student's full-time tuition. No add-ons or extra charges.

Tuition waivers for fifth-year (graduate year, including summer) students in the Accelerated Track for the first two years of the program or the first six students, whichever comes first. Thereafter, fifth-year students pay tuition at undergraduate rates.

* dollar amounts currently being negotiated