BBCB Curriculum Overview



Curriculum. Year One

Lab Rotations/Selection of Thesis Advisor (BBCB6990)

Optional June matriculation - 12 week rotation before first yearAcademic year rotations - minimum 10 weeks, flexibleRotation 1Sept-Nov/DecRotation 2Jan-March/AprilRotation 3April-JuneRotation 4 (if needed)July-Aug

- At the end of each rotation students report in one each of: Written, Oral, and Poster formats.
- Your rotation is a graded course, lab portion based on evaluation by your advisor and the report evaluation by the faculty rotation director

Curriculum. Year One

Fall 1 (4 credits)

Cell Biology & Biochemistry (BIOM 6000) Macromolecular Biophysics (BBCB 5080) Rotation (BBCB 6990) Elective/Independent Study (BBCB 7990)

Spring 1 (4 credits)

Structural and Mechanistic Biochemistry (BBCB 5090) Data analysis and Scientific Inference (BBCB 5100) Rotation (BBCB 6990) Elective/Independent Study (BBCB 7990)

Summer 1

Rotation (BBCB 6990) (if not a summer matric) Independent Study (BBCB 7990) (3 credits)

Annually: Responsible Conduct in Research thru lectures, workshops, case studies, themed lab meetings

Curriculum. Year Two

Fall 2 (4 credits) Remainder of 4 Electives Pre-Dissertation Independent Study (BBCB 7990)

Spring 2 (4 credits)

BBCB7050 Candidacy Exam Prep Course (1/2 credit) Candidacy Exam

Pre-Dissertation Independent Study (BBCB 7990)

Summer 2

Thesis work, 24/7!

Curriculum. Combined Degree

Medical School

Year 1

Fall

Top. Molc. Med. (Grad Class)

Lab Rotation 2

Spring Lab Rotation 1

Summer

Year 2

Fall

Case Studies Trans. Res. (Grad Class)

Spring

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Late Summer Lab Rotation 3*

Graduate School

Year 3 (8 Credits)

Fall

BBCB5080 Biophysics Oct: End Rotation 3

Spring

BBCB5090 Biochemistry BBCB5100 Data Analysis Sc. Inf. BBCB7050 Candidacy Prep Candidacy Exam

Years 4, 5, & 6

BBCB5100 (alt.)

Dissertation

* If necessary

Curriculum. Years One/Two

Four Electives throughout Fall/Spring semesters

Example Courses from BBCB

BBCB5540 Macromolecular Crystallography BBCB5850 Wistar Institute Cancer Biology Course BBCB6220 Molecular Motors/Mechano-enzymes BBCB5670 Bioinorganic Chemistry BBCB6010 Fundamentals of Magnetic Resonance BBCB6500 Current Biochemical Topics BBCB7510 Frontiers in bio-organic and medicinal chemistry BBCB5980 Tutorial. Topic by mutual arrangement between student and faculty.

Courses from other Graduate Groups

Any science course 5000-level and above, subject to approval from advising committee

BGS graduate groups: Cell & Molecular Biology, Neuroscience, Pharmacology, Genomics & Computational Biology, Immunology, Epi/Biostats

SEAS/SAS: Chemistry, Physics, Biology, Bioengineering, and more

Candidacy Examination

- A significant point of transition from formal classroom instruction to guided but independent research
- Helps you formulate your dissertation topic
- An important "legal" requirement for admission to candidacy for the Ph.D. degree
- Completed in spring of second year

The form of the Candidacy Exam.

- Either dissertation-related topic or student choice
- Formed around the preparation of an NIH-style grant proposal.
- Many students re-use this for successful F32 fellowship applications
- Supported by a mini-course focusing on grant writing

Dissertation Research

- The main focus of the PhD degree
- The student: faculty ratio is ~ 1. Many labs from which to choose
- Target of 3 years post-candidacy exam
- Often multi-disciplinary and collaborative
- Guided by a committee of three faculty, meet every 6 months.
- Many opportunities to present and discuss your research FRD, Annual Retreat, Lab Meetings, National Meetings
- Teaching opportunities available undergrad and grad courses, up to 2 semesters with compensation.
- Outreach Upward Bound Math Science program, mentoring in local high schools, SPARX Program, Science Policy Group.....

Other Training Opportunities

Biochemistry & Biophysics Dept. Weekly Seminar (Raiziss Rounds)

Required for all students. Thursday 12-1pm. Austrian Auditorium. Beverages, Cookies Opportunity for lunch with the speaker Can be taken as part of BBCB7500 1 credit course

Friday Research Discussions (FRD)

Required for all students Friday 3.30-4.30pm, followed by happy hour with food, drink

Structural Biology Training Grant Meetings

Monthly meeting with external speakers (some are alums) Variety of topics: Career paths, academic and non-academic lunch provided

BGS travel fund

Travel expenses up to \$1000 once per year per student to present at a national meeting, or \$500 to attend a training course

Other Training Opportunities

Appointment to Training Grants (competitive)

Structural Biology and Molecular Biophysics (PI: Ben Black, Lis Rhoades) Chemistry-Biology Interface (PI: Ronen Marmostein, James Petersen) Structural, Physiological and Functional MRI imaging (PI: Felix Wehrli) 70+ other training grants at U. Penn! Typically appointed in summer of 2nd or 3rd year.

Certificate Programs

Graduate Training in Medical Science Public Health Environmental Health Sciences

Various other certificate programs less germane to BBCB