

BCB Governance Document

This document contains the general rules for the governance of the Interdepartmental Bioinformatics and Computational Biology Graduate Program, referred to hereafter as the BCB Program.

I. Mission

The BCB Program is an interdepartmental and interdisciplinary training program created to provide advanced training and to foster research excellence in Bioinformatics and Computational Biology at Iowa State University. The majority of fields in biology are data-rich, typified by a large volume and complexity of accumulating data. This includes, but is not limited to, genome and metagenome sequences, RNA and protein expression data, metabolite data, phenome data, and the increasing availability of organism-specific, disease-specific, protein-specific, and various systems-level data. The BCB discipline addresses a critical challenge in biology: bridging the gap between the rate at which scientific data are being gathered and stored in digital form, and our ability to fully exploit these data. The BCB program at ISU provides training for students to meet this challenge.

The objectives of the graduate program are:

- To provide a broad and robust graduate student training in Bioinformatics and Computational Biology with an emphasis on academic excellence. Students will graduate from the program with expertise in both the computational and biological disciplines, and will have completed a novel research project.
- To enhance the national and international reputation of Iowa State University in the field of Bioinformatics and Computational Biology.
- To foster intellectual exchange and research collaborations among Iowa State Bioinformatics and Computational Biology faculty, students, and staff.

II. Scope of the Program

The scope of the program is the application of the computational sciences to theoretical, foundational, and applied biological sciences; chiefly, research that addresses problems related to storage, retrieval and analysis of information about molecular sequence, structure, function, and evolution. Relevant topics include, but are not limited to: systems biology, genomics, proteomics, metabolomics, phenomics, functional genomics, evolutionary genomics,

epigenomics, metagenomics, characterization of structure/function relationships, prediction of macromolecular structure, representation of biological data, design and implementation of biological data storage, and design and implementation of algorithmic, statistical and machine learning methods for biological data.

III. Relationship of the BCB Program to Participating Departments

Any department at Iowa State University may become affiliated with the BCB program. The relationship between Interdepartmental graduate majors and academic departments is discussed in the ISU Graduate Student Handbook. Academic departments that serve as **home departments** for BCB graduate students are required to treat all graduate students equally and cannot impose additional program requirements. An academic department may elect not to serve as the home department of a BCB graduate student, but it cannot base the decision on the major or admissions standards. Subject to the interdepartmental program guidelines that are in the ISU Graduate Student Handbook, academic departments gain access to BCB's recruitment efforts, funds to support first year students, tuition revenue from students who make the department their home, and the diverse perspectives of graduate students with different backgrounds.

Academic departments that wish to be affiliated with the BCB Program should have at least one graduate faculty member who is actively involved in Bioinformatics or Computational Biology research. To apply for membership, the department chair should send a memo to the BCB Program Chair indicating the department's commitment to the BCB Program, as evidenced by:

1. A willingness to recognize time spent by faculty who actively participate in the operations of the BCB Program: research, teaching, service or a combination thereof;
2. An agreement to treat BCB graduate students seeking home department status in the member department according to the principles established in the ISU Graduate Student Handbook; and
3. A willingness to support, encourage, and assign BCB member faculty to teach BCB courses.

Once affiliated, an academic department will remain affiliated with the BCB Program as long as it has faculty members who are members of the BCB Program. If all such memberships end, the departmental affiliation will lapse after one year. In the event of departmental reorganization, new departments will inherit membership in the BCB Program if the new department has faculty members in the BCB Program. A Department Chair may withdraw an affiliated department from the BCB Program by sending a memo to the BCB Program Chair, but the department must continue to treat graduate students already granted home department status according to the ISU Graduate Student Handbook.

IV. Students

PhD students graduating from the program should:

- Be able to formulate a research question, devise a plan to answer it, and independently implement it, as evidenced by passing their preliminary exam and the dissertation defense.
- Have a minimum of one paper submitted to a peer-reviewed journal. The manuscript should be directly related to their dissertation project, and they should have contributed a substantial part of the work and authorship. However, the expectation is that a typical dissertation consists of 2-4 independently publishable manuscripts.
- Be able to communicate science clearly as evidenced by oral presentations, poster presentations, and the writing of articles, grant proposals, or both.
- Be able to program: develop and encode methods for data discovery and/or analysis (as opposed to the exclusive deployment of existing software and tools for computational analyses).
- Be experts in both the biological and computational components of their fields of study.

Meeting these expectations is built into BCB course requirements and POS committee expectations. The major professor, or the major professor and co-major professor jointly, must be competent to oversee the interdisciplinary research required of students. Care should be taken that each student supervised in the program shall be able to receive unhindered guidance in both fields, to best serve the program's requirements.

Details of the curriculum, rotations, exams and other requirements are provided in the BCB Program Graduate Student Handbook. Responsibility for maintaining and revising the BCB Program Graduate Student Handbook will reside with the Chair, Supervisory, and Curriculum Committees. Major changes in the document will require approval of the BCB faculty.

V. Faculty

Any faculty member at Iowa State University who are actively involved or intends to become actively involved in bioinformatics/computational biology research, teaching, or both may apply for membership in the BCB Program. Prospective faculty must be members of both an existing department at ISU and the Graduate College. To join the BCB program, individuals must submit an application to the BCB Supervisory Committee for consideration. Current members will be reminded at least six months before their membership lapses, and are subsequently responsible for preparing and submitting a renewal application to the Supervisory Committee.

After approval by the Supervisory Committee, acceptance or renewal of membership will be determined by a majority vote of the BCB faculty members. Membership in the program will last five years. The renewal procedure will be the same as the faculty acceptance procedure, except

faculty must demonstrate active (as opposed to planned) research, teaching, or mentoring in the field of BCB.

VI. Administration

The Interdepartmental Bioinformatics and Computational Biology graduate program is the responsibility of the BCB faculty and is administered by the Graduate College. The leadership team includes a Chair (also the Director of Graduate Education or DOGE), an Associate Chair, and a Supervisory Committee, all elected from the faculty membership. The Graduate College interfaces with graduate programs via the DOGE, who will negotiate with the College for staff support (administrative and secretarial), phones, and office space.

- *Chair and Associate Chair*

All activities of the BCB program will be coordinated by the Chair, who serves a two year term. Elections are held every two years for the position of Associate Chair, who will serve a two year term as Associate Chair, followed by a two year term as Chair. The BCB Chair and Associate Chair may reside in any participating department. In the event that the Chair cannot complete his or her term of service, the Associate Chair becomes the acting Chair and a nomination and election process is set in motion.

The Chair is the designated Director of Graduate Education (DOGE) for the major, and as such, is the faculty member recognized by the Graduate College to be responsible for the day-to-day supervision of the graduate program and the monitoring of graduate student progress. The chair also provides general Program leadership. The Chair's specific responsibilities include carrying out existing program policies, suggesting new policies, administering the budget, serving as a liaison with the Graduate College and other relevant administrative bodies, establishing and appointing members to committees other than the elected Supervisory Committee, coordinating the efforts of BCB committees, and working with office staff. The Chair may also assign responsibilities to BCB Committees, the Associate Chair, faculty or staff; in these instances, however, the Chair will assume responsibility for ensuring that the tasks are performed satisfactorily.

The Associate Chair's responsibilities include sharing in administrative duties, as assigned by the Chair. These can include chairing committees, serving as an additional liaison with the Graduate College, and assisting in the management of students. The Associate Chair shall serve as Chair in the absence of the latter. The two year term of the Associate Chair provides a training period and administrative continuity when the Associate Chair transitions to the Chair position.

Elections for Associate Chair (future Chair) are held every two years and are administered by the Supervisory Committee. Nominations for Associate Chair are solicited from the BCB membership and nominees willing to serve are voted upon by the membership, following the Elections and Referenda policy. Elections should be held by May 15. On August 1 of that year, the Chair (previously the Associate Chair) and newly elected Associate Chair assume office.

- *Supervisory Committee*

The Supervisory Committee is responsible for reviewing all aspects of the program, for guiding the establishment of policy, for interpreting and implementing policies that have been established by the BCB membership, and for advising the Chair.

In all decisions, each member, including the Chair, will have one vote. In case of disagreements between the Supervisory Committee and the Chair, the Supervisory Committee will have final authority. In the case of disagreements between the Supervisory Committee and the faculty, the faculty view, as determined by referenda, will prevail.

Membership - The Supervisory Committee will include five voting faculty of the BCB Program, including the Chair and Associate Chair. The other three members should provide broad representation from participating departments and all major aspects of the BCB discipline.

Supervisory Committee members (excluding the Chair and Associate Chair) will serve for three years. Ideally, one member of this committee will be replaced each year. Members may be re-elected to one consecutive term. Exception: time spent on the committee as Chair or Associate Chair does not count towards committee term limits.

The Supervisory Committee will be elected by the BCB faculty. Elections will be held each year before May 15 and will be administered by the Supervisory Committee. Nominations will be solicited from the BCB membership, with specific emphasis on ensuring that the nominees fulfill BCB's commitment to broad representation. Nominees willing to serve will be voted upon by the BCB membership. Terms will start on August 1. The Supervisory Committee may appoint a BCB member on a temporary basis (until the next scheduled election) to complete any unfinished term of a Committee member or Associate Chair, or to substitute for a Committee member or Associate Chair on leave.

Non-voting Membership - All Principal Investigators (PI) or Program Directors (PD) on all training grants obtained for the purpose of supplying stipends for majors in BCB will serve as non-voting members of the Supervisory Committee. Past Chairs will serve as non-voting members for one year after the completion of their term.

Meetings - To ensure good communication between the Chair and the Supervisory Committee, the Supervisory Committee should meet monthly, preferably at a regularly scheduled time. It is the responsibility of the Chair to call meetings; if the Chair is not available, meetings may be called by the Associate Chair.

- *Committees*

Committees of BCB Faculty will be established as needed to perform tasks and advise the Chair on matters such as student admissions, curriculum, academic standards and faculty membership. The BCB Chair will establish the membership and responsibilities of each committee at the start of each academic year and as needed for ad hoc committees. Committee appointments are

generally for a minimum of two years. The Chair may also replace members that are unable to continue serving. To encourage continuity, the Chair may request common committees, listed below, to prepare end-of-year reports briefly describing their charge and activities during the preceding year.

- Curriculum committee: This committee regularly reviews the curriculum, making recommendations for revisions, new courses, or other curricular changes to the BCB Chair and Supervisory Committee. It assists the Chair and Supervisory Committee in identifying problems with BCB courses, proposing solutions, coordinating the BCB-related courses provided by various departments, and communicating with BCB-supporting training grants regarding grant-required courses. The committee assists staff in submitting and routing new course approval forms, submitting course offerings to the registrar for the schedule of classes, revising and updating the catalog copy, including coordination with any cross-listing departments.
- Admissions committee: The admissions committee serves to review applicants to the BCB Program. The committee's overall purpose is to recruit and select applicants who are predicted to excel in the BCB Program curriculum and graduate as future scientists capable of impacting the discipline of bioinformatics. Each year, the committee will generate a ranked list of acceptable applicants, working closely with the BCB Chair and program coordinator to make offers and finalize the incoming class. The committee is also tasked with continuously improving the effectiveness and efficiency of the recruitment and admissions process.
- BCB GSO: The BCB GSO consists of graduate students within the BCB program and is led by both elected officers (President, Vice President, Treasurer) and appointed directors of sub-committees (e.g., Outreach, Research Consulting, Information Technology, Social Activities). The BCB GSO is overseen by a BCB faculty advisor and is supported by the Program Coordinator. The BCB GSO provides opportunities for graduate students to engage in research, education, outreach and career-development activities (e.g., the organization of the annual GSO-led BCB Symposium).

The BCBLab is a bioinformatics and computational biology consulting service provided by the BCB GSO. Clients, who need not be members of the BCB Program, can request assistance with bioinformatic or computational biology problems. Appropriate compensation (e.g. co-authorship on resulting publication) are negotiated prior to start of work. For transparency in the process, each project is formalized with a written agreement acknowledged by the client, the consultants and their major professors. BCBLab provides BCB GSO members with the opportunity to work in teams, gain bioinformatics consulting experience, and interact with faculty, students and others outside their normal associates.

- ***Faculty Meetings***

Full faculty meetings should be held at least once per year to update faculty on BCB activities and to discuss issues of importance to the group. It is the responsibility of the Chair to call meetings; if the Chair is not available, the meetings may be called by the Associate Chair. A graduate student representative, president of the BCBGSO or their designee, is encouraged to attend these meetings except when the program Chair identifies a conflict of interest. Emeritus faculty are invited as *ex-officio*.

- ***Establishment of Policies***

All policies modifying core-course requirements and major changes in core-course content must be made via a BCB faculty referendum. All other policies may be established by a vote of the Supervisory Committee. However, the Supervisory Committee should consult with the faculty when making significant policy decisions and should hold referenda for policy changes likely to be controversial. In addition, all policy decisions by the Supervisory Committee must be announced to the faculty; if three or more faculty object to a policy, a referendum must be held to determine its acceptance or rejection.

- ***Elections and Referenda***

All elections and referenda will be determined by a majority vote of the BCB faculty membership who respond to the call for votes; at least 50% of the membership must vote in an election or referendum to be valid.

VIII. Amendment of Governance Document

Amendment of this document requires a faculty referendum. The Supervisory Committee reserves the right to update the language in this document on inconsequential items like spelling and grammatical changes to clarify meaning without calling for a vote.

If any provisions of this governance document are invalid, the remaining provisions shall nevertheless remain effective. In such cases, the Supervisory Committee must replace invalid provisions with valid provisions in keeping with the meaning and intent of those that have become invalid.