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## CBB STUDENT TIMELINE

### 1st Year
- **Third week in August**: Orientation week, Initial advisory committee meeting
- **First Week in September**: Submit 1st Rotation to Program Coordinator
- **November - December**: Submit 2nd Rotation to Program Coordinator
- **December**: Advisory committee meeting, register for spring semester

<table>
<thead>
<tr>
<th>Month</th>
<th>Event</th>
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<tbody>
<tr>
<td>March - April</td>
<td>Submit 3rd Rotation to Program Coordinator</td>
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<tr>
<td>April</td>
<td>Submit Progress Report Form and Annual Survey to Program Coordinator</td>
</tr>
<tr>
<td>April</td>
<td>Advisory committee meeting, register for fall semester</td>
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**End of Summer Term**: Submit Dissertation Advisor/Co-advisor Selection Form, Dissertation Student Commitment Form & Financial Statement Form to Program Coordinator (Please use Duke Grad School forms)

### 2nd Year
- **August**: Meet with advisory committee
- **August**: Submit Committee Approval Form to Program Coordinator (Please use Duke Grad School form)

**By March 1**: Pre Prelim meeting with Dissertation Committee to prepare for prelim exam. Submit one-page summary to Program Coordinator and Committee. Submit Prelim Target Date to Program Coordinator

**Before April 15th**: Submit Progress Report Form and Annual Survey to Program Coordinator

**August-September**: Schedule Prelim Exam -Give Date to Program Coordinator

### 3rd Year
- **By December 1**: Prelim Exam (Please use Duke Grad School form), Submit written proposal to Program Coordinator (important) and Prelim Committee before the scheduled exam

**April**: Submit Progress Report Form and Annual Survey to Program Coordinator

### 4th Year and Beyond
- **Before end of fall semester**: Annual meeting with dissertation committee. Submit summary of progress toward dissertation (one-two pages) to committee and Program Coordinator prior to meeting.

**April**: Submit Progress Report Form and Annual Survey to Program Coordinator
CBB CURRICULUM

Required Courses:
The CBB program is explicitly designed to be responsive to the breadth, newness and rapidly evolving nature of computational biology. Therefore, it does not have a heavy emphasis on required courses. All students admitted directly to the CBB Graduate Program complete the following three CBB core courses. Also, a Biology, Computer Science and STATS prerequisite course may be necessary. The Biology and Computer Science prerequisite courses will be based on assessment exams given during orientation week. The STATS prerequisite will be based on previous training.

- CBB 520 Genomic Tools and Technologies, 3 units
- CBB 561, 662, 663, Algorithms in Computational Biology, 3 units
- CBB 540, Statistical Methods for Computational Biology, 3 units
- CBB 510S Weekly Seminar, 1 unit
- CBB 511 Journal Club/Student Seminar, 1 unit
- BIOLOGY 201L or 202L
- CPS 330/530 Algorithms
- STATS 611

The CBB core curriculum emphasizes the integration of biology and computation. This emphasis is reflected in each core course, which includes lectures on biological applications of the informatics and computational principles being discussed. To be eligible to take the preliminary exam, a student must receive a grade of B or better in each of the core courses. In addition to the core courses, all CBB graduate students will receive formal exposure to ethical and legal issues related to genomics, bioinformatics and genome technology through a series of workshops held each year at the Student Retreat.

Elective Courses:
Additional CBB courses are offered as electives. Most students take a broad set of CBB courses as they define their own paths through the program. The Advisory Committee (in the first and second years) and the Dissertation Committee work with the student to design a series of elective courses to be taken beyond the core courses. Acceptable electives are not limited only to genomics, mathematics, statistics, genome technology or computer science courses, but can also include courses in other fields, particularly in the biological sciences, that advance the educational ends of the student's specific graduate program.

CBB Seminar and CBB Journal Club/Student Seminar:
CBB 510S Computational Biology Seminar, 1 unit – All first- and second-year CBB students are required to register for and attend this class. Students in their third year and beyond are expected to present two 50-minute seminars, one after the completion of their preliminary exam and one the semester prior to their dissertation defense. The seminar will also include faculty speakers from on- & off-campus. CBB 511 Journal Club/Student Seminar, 1 unit is required for all first-year and second-year students in fall and spring semester.

CBB 591 Independent Study (Rotations):
During their first year in residence, students should complete at least three "research rotations," each consisting of a tutorial-level independent study with different faculty members in the CBB Program (CBB 591 3 units). At the start of each rotation, the student should send the DGS an e-mail with the name of the rotation supervisor and the planned dates of the rotation. All three rotations should be carried out under the guidance of CBB Graduate Program Faculty from more than one participating department; rotations with faculty outside of the CBB Program must be approved in advance by the DGS. The rotation advisor will be asked to complete a Rotation Evaluation Form at the end of the rotation. The rotation advisor may request a written report or oral group meeting presentation. Students also will be asked to complete a Student Evaluation Form at the end of the rotation.
Credit Requirements:

Students should take a sufficient number of graded credits so that they meet the Grad School minimum (24 graded credits) by the fall semester of their third year (end of 5th semester). Students should typically take 3 courses (3 graded credits per course) in each of their first two semesters. This will allow for 18 graded credits by the end of Year One. The remaining 6 credits can be picked up in Year Two and the beginning of Year Three.

Responsible Conduct in Research (RCR):

All matriculating CBB PhD students at Duke University are required to complete 18 hours of RCR training. To accomplish this, incoming CBB students must attend the Fall RCR Orientation weekend in Beaufort, NC. Attendance at two RCR Forums within the first three years of his/her program is also required. The schedule of Graduate School-sponsored RCR Forums will be provided at the beginning of each semester on the Graduate School’s website https://gradschool.duke.edu/professional-development/programs/responsible-conduct-research/rcr-forums
Students are responsible for checking the schedule, pre-registering, and participating in these events to complete their RCR degree requirement. Students must pre-register for RCR Forums on the Graduate School web site - NOT through ACES.

3rd-Year RCR Workshop: A 4 credit-hour RCR course is required of all third-year graduate students as a sequel to the first-year RCR Beaufort course. The course will be held in July for students at the end of Year Three of graduate school. Students who have not completed their PhD by the end of Year Seven and have not retrained since taking the third-year course, will be required to retake the course. This policy will ensure that all students are retrained at least every four years, which is an NIH requirement. Overall, students are required to have 18 hours of RCR training: 12 hours in their first year at the Beaufort weekend retreat; 2 hours of an “elective” forum on a variable topic selected by the student; and, finally, 4 hours of non-elective third-year training.

English for International Students Program:

The EIS program was created by the Graduate School specifically to help international students improve their academic speaking and writing skills and prepare for greater success in their academic work, allowing them to represent Duke University with excellence both domestically (on and off campus) and globally.

All international students whose first language is not English are required to take oral and written English placement exams administered by the English for International Students program during Fall Orientation. Depending on their exam results, students are either exempted from or placed into one or more EIS courses. For more information, see the web site. https://gradschool.duke.edu/academics/english-international-students

NOTE: These exams are independent of the TOEFL/IELTS score submission requirement.

Additional Resources for International Students at Duke University:

The Graduate School supports two services for international graduate students beyond the course offerings of the English for International Student program. These are particularly important sources of support for later-year students, as the EIS courses are typically completed in the early years of study.

1. At Duke’s Writing Studio, international graduate students can work on any writing assignment or project, including proposals, journal articles, and the dissertation, with trained writing tutors. The Studio now has an ESL specialist, and all tutors are trained to work specifically with non-native speakers. Students may request a specific tutor, if they wish, and can work with the same tutor over multiple appointments.
2. Analogous opportunities for speaking are provided through the EIS program’s **Oral Skills Coaching** service. Students can meet in one-on-one sessions with an experienced ESL speaking coach to develop and rehearse any type of oral presentation. Students use this service to rehearse and receive feedback on typical oral presentations such as departmental and conference presentations, poster sessions, interviews, job talks, proposal defenses, and qualifying and preliminary exams.

**Additional resources** for international students at Duke University include:

- International House [https://studentaffairs.duke.edu/ihouse](https://studentaffairs.duke.edu/ihouse)
- Duke Visa Services [https://visaservices.duke.edu/](https://visaservices.duke.edu/)

**Individuals with Disabilities:**

The Duke CBB program is committed to providing reasonable accommodations for qualified individuals with disabilities in compliance with Section 504 of the Federal Rehabilitation Act of 1973, the Americans with Disabilities Act (ADA) of 1990 and the ADA Amendments Act of 2008, as well as applicable state regulation and federal and state privacy laws. If you believe you may need and qualify for reasonable accommodations, please visit Duke’s Disability Management System at [http://www.access.duke.edu/students/index.php](http://www.access.duke.edu/students/index.php) for detailed information and procedures.

**A Typical CBB Semester Course Calendar:**

<table>
<thead>
<tr>
<th>First year Fall Semester</th>
<th>CBB 510S Computational Biology Seminar - 1 unit</th>
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<tbody>
<tr>
<td></td>
<td>CBB 511 Journal Club/Student Seminar – 1 unit</td>
</tr>
<tr>
<td></td>
<td>CBB 520 Genome Tools &amp; Technologies - 3 units</td>
</tr>
<tr>
<td></td>
<td>CBB 591 Independent Study (Rotations) - 3 units</td>
</tr>
<tr>
<td></td>
<td>Computer Science 330/530 Algorithms (Prerequisite)</td>
</tr>
<tr>
<td></td>
<td>Statistics 611 - 3 units (Prerequisite)</td>
</tr>
<tr>
<td></td>
<td>Biology 201 or 202L (equivalent or previous training) - 3 units (Prerequisite)</td>
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<tr>
<td></td>
<td>Responsible Conduct in Research (RCR)</td>
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<table>
<thead>
<tr>
<th>First year Spring Semester</th>
<th>CBB 510S Computational Biology Seminar - 1 unit</th>
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<tbody>
<tr>
<td></td>
<td>CBB 511 Journal Club 1 unit</td>
</tr>
<tr>
<td></td>
<td>CBB 561,662,663 Algorithms in Computational Biology 3 units</td>
</tr>
<tr>
<td></td>
<td>CBB 540 Statistical Methods for Computational Biology 3 units</td>
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<td></td>
<td>CBB 591 Independent Study (Rotations) 3 units</td>
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| First year Summer Semester | Summer Continuation |

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<tr>
<th>Second year Fall Semester</th>
<th>CBB 510S Computational Biology Seminar 1 unit</th>
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<tbody>
<tr>
<td></td>
<td>CBB 511 Journal Club/Student Seminar 1 unit</td>
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<tr>
<td></td>
<td>Biology, Statistics or Computer Science Elective 3 units</td>
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<tr>
<td></td>
<td>Register for summer Independent Study (Rotation Credit) 3 units</td>
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<table>
<thead>
<tr>
<th>Second year Spring Semester</th>
<th>CBB 510S Computational Biology Seminar 1 unit</th>
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<tbody>
<tr>
<td></td>
<td>CBB 511 Journal Club 1 unit</td>
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</table>
Registration:
Detailed instructions on how to register for courses are available at: http://registrar.duke.edu/registration

Don’t forget these important points when registering for courses:

• All students are expected to register at the times specified by the university. A late registration fee of $25 is charged any student registering late, including a current student who delays registering until the registration for new students.
• All students must register each fall, spring and summer semester for "continuation" and pay a registration fee each semester until all degree requirements are completed, unless waived by an approved leave of absence granted by the dean. Graduate students who are in residence during the summer session, but not enrolled in any courses, pay only the "continuation" fee. Failure to maintain "continuation" registration each semester will result in administrative withdrawal from the university.

Advisory Committee:
The Advisory Committee, composed of the Director of Graduate Studies and additional CBB faculty, advises incoming students about courses to be taken in the first and second years based on the student's background, interests and the requirements of the program. The committee meets the week before fall and spring registration and again during fall orientation week. Individual members of the advisory committee are available for personal appointments, and students should arrange such meetings via e-mail.

Advisory Committee Members
Ryan Baugh  ryan.baugh@duke.edu
Fred Dietrich  fred.dietrich@duke.edu
Raluca Gordan  raluca.gordan@duke.edu
Tim Reddy (DGS)  tim.reddy@duke.edu

Dissertation Advisor(s) and Committee:
Typically, before the beginning of fall semester of their second year the student selects a graduate advisor. The program strongly encourages the selection of a co-advisor who is complementary to the primary advisor, so that the two advisors represent both computational and experimental science. The Dissertation Advisor Association Forms should be filled out and signed by the student and advisor(s) then submitted to the program coordinator by July.

Early in the second year, the student forms a permanent dissertation advisory committee, in consultation with her or his advisor(s). The dissertation advisory committee consists of at least four and often five faculty members, including advisor(s). At least three committee members must be members of the CBB Graduate Program Faculty, and one member must represent the related or minor area. The minor area representative often is from a department outside of CBB but must be a member of the Duke Graduate Faculty. A person who is not a full member of the graduate faculty in a graduate degree program at Duke should be appointed as a term graduate faculty member for the academic term that corresponds to the projected duration of the committee service.

The selection and approval of advisor and committee follows the standard procedures of the Graduate School, a process initiated by the submission of a completed Committee Approval Form to the program coordinator in August. The dissertation committee advises the student about additional courses, oversees their PhD research, and guides the student in preparing for the Preliminary Examination, all of which is accomplished during a meeting scheduled sometime before the spring semester of the student's second year. The Preliminary Exam will be conducted by the dissertation committee by September of the third year. In subsequent years and before April 15th, the student must submit to the committee members a one-two page summary of her or his research accomplishments in the past year and meet with committee. At the meeting, the student should present a 20-minute summary of their research and discuss their progress with the committee. The Record of Annual Progress Meeting, along with a copy of the written summary, should be submitted to the program coordinator along with the Annual Progress Report before April 15th.
**Graduate Student Committee:**
The graduate student committee coordinates student-run activities such as the annual graduate student retreat. It also acts as a representative of CBB students to the director and DGS. Proposals for social activities and general student issues should be submitted to liz.labriola@duke.edu

**Vacation Policy/Time Off:**
The customary vacation policy for Duke graduate students is 2 weeks per year. University fall and spring breaks are intended for undergraduate students. The expectation is that graduate students now have “real jobs” and are expected to come to lab daily and to be productive. Time off beyond the standard 2 weeks during year 1 and 2 of training should be approved by the CBB DGS.

For years 3 and beyond time off should be formally requested from the advisor/mentor. It is not appropriate to simply tell one’s advisor when one is taking time off. Each graduate student is considered an integral part of the lab and consequently, his/her contribution to the lab will be impacted by absences. Officially, two weeks of time off/vacation have been mandated by the Graduate School. However, any time in excess of two weeks must be requested by the student and approved by the PI/advisor.

**CBB Student Listserv cbbstudents (at) duke.edu:**
The CBB student listserv is available for inter-student communication and distribution of messages from the Program Coordinator.

**Annual Progress Reports & Student Annual Survey:**
In an effort to monitor student progress towards the degree, the CBB program and the Duke graduate school requires all doctoral students to file an Annual Progress Report with their DGS. This report is due to the program coordinator no later than April 15th of each year. In an effort to monitor student satisfaction and achievable goals with the CBB PhD program, we will also require that students complete the Annual Student Survey.
PROGRAM INFORMATION AND POLICIES

DGS Office:
The DGS and Program Coordinator serve as advocates for the CBB students, who are encouraged to approach the DGS office with school-related and/or personal concerns. All issues discussed will remain confidential. Students may either meet with the DGS and or Program Coordinator during their regular office hours Monday-Friday or schedule an appointment.

The central mission of the Office of Graduate Student Affairs (GSA) is to enhance the quality of graduate student life by working closely with individual students, student organizations, faculty, and other campus offices. The aim is to provide a broad array of programs on such issues as health, safety, housing, mentoring, and career development. This office is committed to helping students become active participants in their personal growth and in the achievement of their educational objectives.

https://studentaffairs.duke.edu/

Graduate Student Affairs makes every attempt to assess and to respond to the concerns of Duke graduate students. In many instances, GSA is the initial point of contact for graduate students, offering informal counseling and advising. Furthermore, GSA acts as the liaison between the Graduate School and the Career Center, Counseling and Psychological Services; the Office for Institutional Equity; the central university Office of Student Affairs; and other campus offices. The Office of Graduate Student Affairs works to create linkages with Duke's graduate departments and the university administration. In addition, GSA representatives are members of national committees, graduate consortia, and professional associations concerned with issues related to graduate student life. Duke University Graduate School.

https://studentaffairs.duke.edu/career
https://studentaffairs.duke.edu/caps
https://web.duke.edu/equity/
https://gradschool.duke.edu/

National Science Foundation Graduate Research Fellowship Program (GRFP):

Each year, many Duke graduate students receive fellowship awards from the National Science Foundation. Students in their first year of the graduate studies with an excellent GPA from their undergraduate institution are encouraged to apply for this fellowship in their first semester. The deadline is usually in the first week of November. Applicants are encouraged to identify one or more CBB faculty who would be willing to help them with their application, for instance their fall rotation supervisor.

The Graduate Research Fellowship provides three years of support for graduate study leading to research-based master’s or doctoral degrees and is intended for students who are at the early stages of their graduate study. Please see the GRFP website, http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=6201, for additional information.

Department of Energy Computational Science Graduate Fellowship:
The Department of Energy Computational Science Graduate Fellowship (DOE CSGF) is a program funded by the Department of Energy’s Office of Science and National Nuclear Security Administration. Now in its 16th year, the DOE CSGF trains scientists to meet the nation’s workforce needs and helps to create a nationwide interdisciplinary community. The fellowship provides support and guidance to some of the nation’s best scientific graduate students, and these graduates now work in DOE laboratories, private industry and educational institutions. The fellowship currently supports 63 students at 35 universities in 22 states. Over 250 students at more than 50 U.S. universities have trained as Fellows, and the demand is only growing. Please see the DOE website, http://science.energy.gov/ for more information.
CBB Retreat:
During fall, the CBB Program holds a student retreat, which is organized by the student committee with assistance from the program coordinator. The retreat is an opportunity for students to learn about each other’s research, brainstorm solutions to scientific problems, and socialize. All students are expected to attend and participate in planned activities.

Travel Stipends:
*CBB Program Awards – for students in their first and second year of study*
CBB students who are in their first and second year of study and are presenting a paper or poster at a conference may request a program travel stipend. Students are limited to one stipend per fiscal year (July 1 – June 30). To apply for an award, please provide the program coordinator with the following information:

- The name of the meeting and other relevant details (conference dates, location, etc)
- A copy of the submitted abstract
- Documentation that the paper or poster was approved for presentation at the conference
- A letter of support from your faculty advisor in whose laboratory or group the accepted work was carried out.

*Graduate School Awards – for students who have passed the preliminary exam*

*Eligibility:* Any graduate student enrolled in a Ph.D. granting program who has passed all parts of the preliminary exams and is actively participating in a conference (i.e., presenting a paper or poster, or leading a discussion). Students are limited to one conference travel fellowship per fiscal year (July 1, June 30). Students attending conferences during the academic year must be registered at the time of the conference. For summer conferences, students must be registered for the upcoming fall semester, and have been registered for the previous spring semester. No exceptions will be made.

*Terms of the Graduate School Award:* The Graduate School will provide 70% of the cost of registration fees, primary travel, three nights lodging, and meals for four days (up to $25 a day): the maximum amount to be paid by the Graduate School is $500. If the student has received a non-departmental grant for travel, this amount must be deducted from the request. Additional information is available at:


Financial Assistance:
The CBB Graduate Program provides support for students admitted directly into the Program for the first two years of doctoral study. Each student admitted into the Program must designate a faculty advisor no later than September of the student’s second year in residence. Beginning July 1st of the third year in residence, the faculty advisor will become responsible for the student’s stipend and tuition remission for the duration of the student's dissertation work. Dissertation Advisor Association Forms found in the Appendix should be submitted to the program coordinator by July of the student’s first year.

Summer Activities/Internships:
CBB student training is a full-time, twelve month per year endeavor. Most students find that the summer is the most productive time for their research because their time is not broken up by classes, seminars, etc. For this reason, the Program discourages non-training related breaks of more than one week in the period between the end of the spring and the end of the fall semesters. Occasionally, students arrange off-campus internships before they have begun their dissertation research. In this event, it is important that the DGS office is made aware of and approves the details of the internship in advance. It is also essential that students not receive financial support from Duke if the internship involves any financial compensation. Failure to inform the DGS office of such an arrangement could have very serious ramifications for the student.

Students may request permission to participate in summer internships outside Duke that significantly advance their disser-
All internships must be approved in advance by the primary advisor and the DGS. Requests should be accompanied by a short written (< 1 pg) description of the internship venue and project, emphasizing the manner in which the internship will directly advance the student's dissertation research. Following completion of the internship, a short summary document (~2 pgs) describing what was accomplished during the internship should be submitted to the DGS. It is important that internships do not delay progress towards degree. Only students who have passed the preliminary exam are eligible. Except in exceptional circumstances, it is expected that internships will be limited to summers in year 3 or 4.

**Computational Biology & Bioinformatics Certificate Requirements:**

*This program is intended for Duke students enrolled in departmental MS or PhD Programs who wish to expand their current studies to apply to or include the field of computational biology & bioinformatics.*

To obtain a certificate in Computational Biology and Bioinformatics (CBB), students must:

1. Take for a grade two of the three CBB core courses (see page 3) and 1 additional graded CBB course.
2. Register for CBB 510S Computational Biology and Bioinformatics Seminar, every semester except the semester of graduation.
3. Appoint at least one member of the CBB faculty to their dissertation committee.

**Teaching Requirements:**

Starting in the Fall of 2011 all CBB students in the CBB program will be required to have one semester of teaching experience. This experience can be obtained through a variety of opportunities, as teaching assistants for the core CBB courses, or courses in related areas (computer science, statistics etc.). This should occur sometime during the 2nd year in the program, if possible. There will be no additional financial compensation for teaching.

**CBB Program Poster Printer:**

- The poster printer is 42 inches long. If possible, please set one of the margins of your poster at 42 inches. The dimensions must not exceed 42x30.
- If your poster is created on a PC, it may be submitted as either a PowerPoint or PDF file. If the poster is created on a Mac or Linux machine, please submit it as a PDF file.
- Make an appointment with the program coordinator to print your poster.
- When you are ready to print, email your file to the program coordinator. If your file is to large to send over email, save your file to a memory stick and come to 102 North Building at your scheduled printing time.
- It takes between 30 – 45 minutes to print the final copy of your poster, so plan accordingly!
**Duke Inter-Institutional Registration Agreement**

Under the inter-institutional registration agreement, any graduate, professional or undergraduate student enrolled as a degree seeking student at any of the following universities may participate in registration via the inter-institutional registration process:

- Duke University
- North Carolina Central University
- North Carolina State University
- University of North Carolina at Chapel Hill
- University of North Carolina at Charlotte
- University of North Carolina at Greensboro

The student may take a course at a participating university if the student's academic advisor and/or dean can certify that the course is appropriate for the student's degree program and that the course is not available during the same academic year at the home institution. Registration deadlines of the home institution should be observed. Students may not audit courses under the inter-institutional registration agreement.

Graduate and professional school students are allowed to enroll in two courses per term (fall and spring semesters), provided that the student is also registered for the balance of his/her normal load at the home institution. During the summer semester, one course is allowed, provided that the student is concurrently registered for one full course credit at the home institution.

Important: please note that the academic calendars and procedures at the six institutions vary. It is very important that students plan carefully and apply early to minimize problems in the registration process. The inter-institutional registration agreement requires students to apply and register for courses only through their home institution. Additional information is available at:

http://registrar.duke.edu/special-registrations/interinstitutional-registration

**Transcripts:**

During the first semester, all students will pay a one-time transcript fee of $40. This allows students to request an unlimited number of copies of their Duke transcript. Students may request copies of their transcripts through their ACES account or at:

http://registrar.duke.edu/student-records/transcripts-verifications

**Leave of Absence:**

A leave of absence for a period of time no longer than one calendar year may be granted because of medical necessity, full-time employment, receipt of an external award, or other acceptable reasons. A request for a leave of absence should originate with the student, be endorsed by the student's major professor and Director of Graduate Studies, and submitted to the Associate Dean of the Graduate School for consideration prior to the beginning of the semester for which the leave is requested. A student is eligible to request a leave of absence only after having completed at least one semester at Duke. Time limitations which pertain to the various degrees and the completion of courses on which a grade of I (incomplete) was earned are not waived. Please consult the Graduate School’s website, https://gradschool.duke.edu/ for additional information.
**Dissertation:**

Students are guided through the dissertation process by their advisor and doctoral committee. Each student is expected to meet with their doctoral committee at least once per year and communicate the results to the DGS through the Record of Annual Progress Meeting Form.

The basic requirements for preparing the dissertation (type of paper, form, and binding) are prescribed in the Guide for the Preparation of Theses and Dissertations on the duke Graduate School website.  
https://gradschool.duke.edu/academics/theses-and-dissertations

The dissertation must be completed to the satisfaction of the professor who directs the dissertation, members of the student's advisory committee, and the Dean of the Graduate School. A copy of the dissertation must be submitted to the Dean of the Graduate School. The initial dissertation submission must take place at least 2 weeks prior to the defense. All dates and deadlines for all semester submissions can be found at the above website.

**Graduation**

Please consult the Graduate School’s [Graduation Website](https://gradschool.duke.edu/academics/preparing-graduate) for information on deadlines, hooding ceremonies, and other important information.

Duke University graduates students in the fall, spring and summer semesters. However, the graduation commencement ceremony is held only once per year at the end of the spring semester. Students who graduated the previous fall or summer semesters are welcome to participate in the spring graduation activities.

https://gradschool.duke.edu/academics/preparing-graduate
SYSTEM ADMINISTRATION AND NETWORK POLICY

1. All program students will be granted user accounts within a CBB administrative domain. These accounts will include a home directory that is stored on a network-accessible file server that is backed up on a regular basis.

2. The program will provide to each student a machine (typically a desktop workstation) sufficient for the completion of the coursework, research rotations, and early research experiences to be undertaken during the first two years of the program. This machine is the property of the program and will be available to students only until they join a research group or lab (typically before the end of their second year in the program), at which time the responsibility for such provision belongs to the research group or lab.

3. The machines provided to students will (by default) be installed on the DHTS network, administered by the program, and configured for straightforward access to the kinds of software packages to be used in courses and during rotations. These machines:
   a. will be monitored, managed, kept up-to-date, and regularly backed up by the program system administrator(s),
   b. will run some flavor of Unix or Linux, with a bootable Windows partition if desired,
   c. will permit user home directories to be mounted transparently via NFS,
   d. will permit users to log in to a common environment that is transparent across machines, enabling different users to use different machines seamlessly.

4. Students will have the option of forgoing the default configuration described above. If students elect for this option, the following will occur:
   a. the machine will be transferred to the OIT network, reducing transparent access to resources managed within the CBB administrative domains that are on the DHTS network,
   b. the default installation of the machine will be wiped clean and the student will be permitted to install the (appropriately licensed) operating system of his or her choice, e.g., a different flavor of Unix or Linux, or a Microsoft Windows OS,
   c. for network security reasons, access to user home directories will no longer be able to be accomplished via NFS so must be accomplished via SSH-tunneled SAMBA or via SCP,
   d. and the user will be entirely responsible for system monitoring, management, keeping all required software up-to-date, maintaining user accounts, and regular backup of the local system (user files stored in the user’s home directory on the file server will still be backed up by the program).

Note that this policy results in the program machine being treated in essentially the same way as any non-program machine (e.g., a laptop owned by a student). One obvious difference is that the program machine remains the property of the program and will be returned to the pool of default machines when the student joins a research group or lab before the end of his or her second year. In either case, any evidence of intentional or unintentional network misuse will result in disqualification of the offending machine's MAC address until the problem is corrected.

5. Regardless of their choice above, when using machines that are attached to university networks (whether program or non-program machines), all students are expected to conform to the policies and guidelines outlined at http://www.oit.duke.edu/oit/policy/. Particular attention should be paid to the Acceptable Use Policy available at http://oit.duke.edu/net-security/network/.

6. Regardless of their choice above, all program students must receive HIPAA training and become certified users of the Protected Health Information (PHI) network within DHTS (because their user accounts are within the CBB administrative domain).

7. All personal web site development will comply with policies outlined at http://oit.duke.edu/voicevideoweb/web/tools/personal.php

8. Third level domain name applications are made exclusively through network administrators as authorized by the CBB executive committee.
1. **Prerequisites.** A prerequisite of the preliminary examination (prelim) is that the student must have received a grade of B or better in each of the CBB core courses. If the student receives a lower grade than B in any of these courses, the student must discuss with the instructor of the course ways to establish a mastery of the course material, as judged by the instructor. When such mastery is demonstrated, the student requests a letter from the instructor to the CBB Director of Graduate Studies (DGS) to this effect.

2. **Prelim Committee and Chair.** The prelim committee consists of the student's dissertation committee, previously approved by the CBB DGS and the Graduate School. After joining a research group, the student should choose their committee in collaboration with their thesis advisor. The committee should consist of 4-5 faculty, 3 of which are CBB faculty. Ideally, there is at least one core or experienced CBB faculty on the committee, as well as a balance of expertise in appropriate disciplines. In most cases the committee is chaired by the student's advisor. If not the advisor, then the core CBB faculty member. All committee members must be graduate school faculty. According to Graduate School Rules, this committee must be approved at least one months before the date of the oral prelim exam.

3. **Pre-prelim Meeting.** The student arranges a meeting with the prelim committee sometime before the spring semester of the student's second year to acquaint the committee with the student's likely dissertation topic. This involves a 20-minute presentation followed by a discussion period during which the committee suggests areas, which the student should study in preparation for the exam. A one-page summary of the presentation should be submitted to each committee member and the program coordinator no later than two days before the scheduled meeting. This meeting is not meant to be an examination, but rather the first opportunity for guidance by the committee for the student's dissertation research and preparation for the prelim. However, students should expect probing questions as the committee helps them identify areas of in-depth study. The committee should also discuss when the student will be ready for the preliminary examination and make a recommendation.

4. **Written Prelim proposal distribution.** The student submits a written proposal describing the dissertation research in the format of an NIH/NSF postdoctoral fellowship (see attached guidelines.) **The document is submitted to each member of the prelim committee with a cover sheet, evaluation form and written preliminary exam format attached 3 weeks prior to the scheduled prelim exam date.** A hard copy of the cover sheet and the document should also be submitted to the program coordinator

5. **Written proposal approval.** Within one week of receiving the proposal, each member of the committee contacts the prelim committee chair to either approve the proposal or to request changes. The chair compiles the requested changes and forwards them to the student, who then resubmits a modified proposal within one week. Committee members have one week to approve the modified proposal or suggest further changes, if necessary.

6. **Oral exam.** Once the entire committee has accepted the written proposal, the oral exam can be held. The exam must take place while semester classes are in session, which includes exam periods.

7. **Oral exam procedure.** During the oral exam, the student presents a summary of the proposal, with interruptions only for questions of clarification. Following the presentation, each committee member asks questions related to the proposal in any of the areas of in-depth study identified in the pre-prelim meeting.

8. **Preliminary Exam Evaluation.** The prelim exam should not last any longer than 3 hours. After all committee members have asked all of their questions and the exam has concluded, the student is asked to leave the room. The committee discusses the exam, both written and oral components, and votes to either pass or fail the student. Provisional passes or postponed decisions are not allowed by Graduate School rules. Passing requires at least three affirmative votes and not more than one negative vote. If a dissertation advisor casts a negative vote, the student does not pass. When a decision is reached, the student is invited back into the room to receive the decision. Each committee member submits a completed evaluation form to the student and advisor(s) at the end of the meeting.

9. **Re-examination.** Should the student fail, he or she may apply, with the consent of the examining committee and the Associate Dean of the Graduate School, for the privilege of a second examination to be taken no sooner than three months after the date of the first. The original committee must conduct the second examination. In order for the student to pass this second examination, the committee's vote must be unanimous. A second failure will render the student ineligible to continue in the doctoral program.
Observe type size specifications throughout the proposal. The application must be clear, readily legible, and conform to the following three requirements: 1) The height of the letters must not be smaller than 10 point; 2) Type density must be no more than 15 characters per inch (cpi). For proportional spacing, the average for any representative section of text must not exceed 15 cpi; 3) No more than 6 lines of type must be within a vertical inch. Type requirements should be checked using a standard device for measuring type size, rather than relying on the font selected for a particular word processing/printer combination. Figures, charts, tables, figure legends, and footnotes may be smaller in size but must be readily legible. The type size used throughout the proposal must conform to all three requirements.

1. Title of Project.
Do not exceed 56 characters, including the spaces between words and punctuation. Choose a title that is specifically descriptive, rather than general.

2. Description
State the application’s broad, long-term objectives and specific aims, making reference to the health relatedness of the project. Describe concisely the research design and methods for achieving these goals. Avoid summaries of past accomplishments and the use of the first person. This description is meant to serve as a succinct and accurate description of the proposed work when separated from the application. **DO NOT EXCEED ONE PAGE.**

3. Research Plan
Organize Items a-d, to answer these questions:
(1) What do you intend to do? (2) Why is the work important? (3) What has already been done? (4) How are you going to do the work? **Do not exceed 12 pages for Items a-e, including figures.**

   a. Specific Aims.
   List the broad, long-term objectives and what the specific research proposed in this application is intended to accomplish. State the hypotheses to be tested. **One page is recommended.**

   b. Background and Significance.
   Briefly sketch the background leading to the present application, critically evaluate existing knowledge, and specifically identify the gaps, which the project is intended to fill. State concisely the importance and health relevance of the research described in this application by relating the specific aims to the broad, long-term objectives. **Two to three pages are recommended.**

   c. Preliminary Studies/Progress Report.
   Use this section to provide an account of the applicant's preliminary studies pertinent to the application information that will help to establish the experience and competence of the investigator to pursue the proposed project. The complete references to appropriate publications and manuscripts submitted or accepted for publication may be listed, and are not part of the page limitations. **3 to 5 pages are recommended for the narrative portion of the Preliminary Studies/Progress Report.**

   d. Research Design and Methods.
   Describe the research design and the procedures to be used to accomplish the specific aims of the project. Include how the data will be collected, analyzed, and interpreted. Describe any new methodology and its advantage over existing methodologies. Discuss the potential difficulties and limitations of the proposed procedures and alternative approaches to achieve the aims. As part of this section, provide a tentative sequence or timetable for the project. Point out any procedures, situations, or materials that may be hazardous to personnel and the precautions to be exercised.

   e. Literature Cited.
   List all references. Each reference must include the title, names of all authors, book or journal, volume number, page numbers, and year of publication.
CBB STUDENT ANNUAL PROGRESS REPORT/CURRICULUM VITAE

Student: ______________________  Year: 1, 2, 3, 4, 5, 6, 7  Date: _____________

EDUCATION

<table>
<thead>
<tr>
<th>Degree</th>
<th>Major field</th>
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COURSES (All students: completed and in progress)

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<tr>
<th>Semester</th>
<th>Number</th>
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<tr>
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<td>Genome Tools and Technologies</td>
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<td>CBB 561,</td>
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<td>Algorithms in Computational Biology</td>
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<tr>
<td>CBB540</td>
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ROTATIONS (First and second year students: completed and in progress)

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<th>Topic</th>
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ADVISOR (Second year students)

<table>
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<tr>
<th>Name</th>
<th>Role</th>
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<tr>
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<td></td>
<td>Co-advisor</td>
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COMMITTEE MEMBERS (Second and Third year students)

<table>
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<tr>
<th>Name</th>
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<tr>
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<td>Member</td>
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COMMITTEE APPROVAL (Second and Third year students)

<table>
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<tr>
<th>Anticipated date of submission:</th>
<th>Date submitted:</th>
<th>Approved: Yes/No</th>
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PRE-PRELIM MEETING (Third year students)

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<thead>
<tr>
<th>Anticipated date of meeting:</th>
<th>Scheduled:</th>
<th>Completed: Yes/No</th>
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</table>

PRELIM EXAM (Third year students)
Anticipated date of prelim: ____________  Scheduled: ____________  Passed: _Yes/No_

FIELD OF RESEARCH (Third year students: provide brief description or title of your area of research)

<p>| | |</p>
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ANNUAL COMMITTEE MEETINGS (Fourth year students and above)

| Meeting date: ____________ | Scheduled: ____________ | Passed: _Yes/No_
|---|---|---|

DISSERTATION PROGRESS (Fourth year students and above)

<table>
<thead>
<tr>
<th>Status: <em>e.g. outlined; chapters completed, etc.</em></th>
<th>Anticipated defense date: ____________</th>
<th>Scheduled: ____________</th>
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PRESENTATIONS (All students)

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<tr>
<th>Date</th>
<th>Title</th>
<th>Oral/Poster</th>
<th>Venue</th>
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<tbody>
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</table>

PUBLICATIONS (All students)

1.  
2.  
3.  

AWARDS (All students: competitive fellowships, travel awards, etc)

1.  
2.  
3.  

TEACHING (Second year students and above)

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Department</th>
<th>Role/Experience</th>
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GRANT/FELLOWSHIP APPLICATIONS (All students)

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<th>P.I.</th>
<th>Grant/fellowship</th>
<th>Agency</th>
<th>Role/Experience</th>
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</tbody>
</table>

CAREER DEVELOPMENT (All students: workshops/networking opportunities/conferences attended)

<table>
<thead>
<tr>
<th>Date</th>
<th>Event/Opportunity</th>
</tr>
</thead>
<tbody>
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</table>

Advisor Signature: ___________________________  Date: ___________________________

Advisor: Please indicate the student is making adequate progress toward degree by the advisor initialing here ___________________________

Please return to CBB office in North Building Room 102
Statement of Financial Support for Graduate Students whose Advisors Hold Primary Appointments outside their Admitting Department or Program

Student Name Date

Student Signature Duke Unique ID Number (Student)

Admitting Program/Department Ph.D. Granting Program/Department

Thesis Advisor (PI): Primary department of thesis advisor:

As thesis advisor to the above student and as department chair, division chief, or business manager for the thesis advisor, we commit to the following policy:

The thesis advisor is responsible for the financial support of this student, provided that the student is making satisfactory progress toward the doctoral degree. Such progress will be subject to ongoing review by the advisor, the Director of Graduate Studies of the department or program, and the student’s committee, where appropriate. Support is normally offered for up to five calendar years from the date of the student’s original matriculation into The Graduate School.

Financial support includes tuition remission, fees and a salary/stipend, determined annually by the Graduate School. If the advisor fails to provide this support, it will be provided by the department or unit which normally receives the indirect cost revenues generated by the advisor’s/PI’s grants. In most cases, this will be the department in which the advisor/PI holds his/her primary appointment. If the student receives another award or assistantship and the level is less than the established stipend and/or that required for tuition and fees, the difference will be supplied by the thesis advisor from other funds or by department/unit sources.

Thesis Advisor's Signature Date______________________________________________________________

Thesis Advisor’s Name__________________________________________________________________________________________

DGS, Advisor’s Department, Signature Date______________________________________________________________

DGS, Advisor's Department, Name_______________________________________________________________________________________

Department/Division Chair Signature Date______________________________________________________________

Department/Division Chair Name_____________________________________________________________________________________

DGS, Admitting Program, Signature Date______________________________________________________________________________

DGS, Admitting Program, Name_______________________________________________________________________________________
TO: CBB Program  
North Building  
Room 102  
Durham NC 27708

FROM: ________________________________  
Student Name  
______________________________  
E-mail address

This memo is to notify the Program in Computational Biology and Bioinformatics that I have chosen to associate with the following dissertation advisor(s):

________________________________  
Primary Advisor  
________________________________  
Department

________________________________  
Co-advisor (if appropriate)  
________________________________  
Department

I acknowledge that my dissertation research will be conducted primarily in space provided by my advisor(s), and I commit to consulting with my advisor(s) on all matters relating to my dissertation research on a regular and continual basis. I also agree to fulfill the Program and Graduate School requirements for dissertation committee selection, Preliminary Exam, Annual Progress Reports, and annual dissertation committee meetings. I attest that I have given the Advisor Commitment Form to the above faculty and will arrange to have the form(s) returned to the Program office.

________________________________  
Student Signature
WRITTEN PRELIMINARY EXAM COVER SHEET

Student: Name

E-mail

Advisor:

Note: All comments should be given directly to the committee chair. If modifications are requested, the (CC) will coordinate communicating the requested changes to the student and advisor.

<table>
<thead>
<tr>
<th>Committee</th>
<th>Name</th>
<th>E-mail Address</th>
<th>Phone</th>
<th>Date Delivered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chair</td>
<td></td>
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<tr>
<td>Member 2</td>
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<td>Member 3</td>
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<td>Member 4</td>
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<tr>
<td>Member 5</td>
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</table>

Target Preliminary Examination Date: 

Students should return completed form and a copy of the written proposal to:

Liz Labriola
102 North Building
CBB PRELIM EXAM EVALUATION

Doctoral candidate: ________________________

Committee member: ________________________ Area of expertise: __________________

Please assess the student in terms of competency in the following areas:

GENERAL KNOWLEDGE AND SKILL

<table>
<thead>
<tr>
<th>Incompetent</th>
<th>Competent</th>
<th>Mastery</th>
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</thead>
<tbody>
<tr>
<td>Uses vocabulary correctly and speaks convincingly about their specific field of biology (________________________).</td>
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<tr>
<td>Demonstrates understanding of the current research landscape in this field of biology.</td>
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<tr>
<td>Demonstrates understanding of how their research fits into this research landscape.</td>
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<tr>
<td>Is able to critically evaluate different computational methods and defend their choice of method used in their research.</td>
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<tr>
<td>Is familiar with both standard methods and newer methods reported in the recent literature.</td>
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<tr>
<td>Can defend use of specific statistical methods in their research.</td>
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<td></td>
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<tr>
<td>Correctly interprets results of statistical analysis.</td>
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<tr>
<td>Can frame a biological research question and propose computational approaches to answer the question.</td>
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<tr>
<td>Demonstrates skills need to develop novel computational algorithms and computer programs.</td>
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WRITTEN EXAM

<table>
<thead>
<tr>
<th>Incompetent</th>
<th>Competent</th>
<th>Mastery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Writes with clarity and focus; able to effectively outline and organize the research question, methods, and results.</td>
<td></td>
<td></td>
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<tr>
<td>Writes in a style consistent with the scientific literature.</td>
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<tr>
<td>Can effectively gather and synthesize a body of literature.</td>
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ORAL EXAM

<table>
<thead>
<tr>
<th>Incompetent</th>
<th>Competent</th>
<th>Mastery</th>
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</thead>
<tbody>
<tr>
<td>Framework of the presentation was organized and well-balanced.</td>
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<tr>
<td>Ability to deliver presentation clearly and confidently.</td>
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<tr>
<td>Ability to formulate appropriate responses to questions from the committee regarding the research.</td>
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Overall evaluation of exam: PASS/FAIL

Comments:

Note to Advisor: Please review completed forms with student after exam, then return them to Liz Labriola, Room 102 North Building
CBB FINAL DISSERTATION DEFENSE EVALUATION

Doctoral candidate: ________________________

Committee member: ________________________ Area of expertise: __________________

Please assess the student in terms of competency in the following areas:

**GENERAL KNOWLEDGE AND SKILLS**

<table>
<thead>
<tr>
<th>Incompetent</th>
<th>Competent</th>
<th>Mastery</th>
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<tr>
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**WRITTEN DEFENSE**

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**ORAL DEFENSE**

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</tr>
<tr>
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</tbody>
</table>

**Comments:**

*Note to Advisor: Please review completed forms with student after exam, then return them to:
Liz Labriola
Room 102 North Building*
# Student Annual Survey

**Student:** ___________________  **Year:** 1, 2, 3, 4, 5, 6, 7  **Date:** ______________

How satisfied are you with achievement of the following goals?

<table>
<thead>
<tr>
<th>Goals</th>
<th>Completely</th>
<th>Partly</th>
<th>Unsatisfied</th>
<th>Comments</th>
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<tbody>
<tr>
<td>• Demonstrate domain subject matter expertise in a specific field of biology (____________________).</td>
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<tr>
<td>• Demonstrate knowledge of latest methods used in computational biology research.</td>
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<tr>
<td>• Demonstrate both a conceptual and operational understanding of statistical methods used in biological research.</td>
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<td>• Demonstrate evidence of productive research (papers, presentations, etc.).</td>
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<tr>
<td>• Improve scientific writing skills.</td>
<td></td>
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<tr>
<td>• Improve oral presentation skills.</td>
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<tr>
<td>• Participate in teaching and mentoring opportunities.</td>
<td></td>
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<tr>
<td>• Participate in grant writing process.</td>
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<tr>
<td>• Participate in submission and/or review of journal articles.</td>
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<tr>
<td>• Take advantage of networking opportunities (hosting seminar speakers, attending Duke seminars, outside conferences and workshops).</td>
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<td>• Take advantage of career development opportunities at Duke (workshops, etc.)</td>
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<tr>
<td>• ________________________</td>
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Return to; Liz Labriola  
102 North Building  
liz.labriola@duke.edu
RECORD OF PRE-PRELIM MEETING

Student: ____________________ Date of Meeting: __________

Signatures of Participating Faculty:

________________________________________
________________________________________
________________________________________
________________________________________
________________________________________
________________________________________

Remarks (please indicate target prelim date):

________________________________________
________________________________________
________________________________________

Return form along with printed summary sheet

Liz Labriola
102 North Building
RECORD OF ANNUAL COMMITTEE PROGRESS MEETING

Student: ____________________________ Date of Meeting: ______

Signatures of Participating Faculty:
__________________________________________________________________________
(Dissertation Advisor)
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

Remarks (please indicate target defense date and the student’s research plans for the summer months)
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

Return Form to:
Liz Labriola
Room 102 North Bldg.
liz.labriola@duke.edu
CBB Research Rotation Evaluation for Student

Student Name:_____________________________ Semester/Year of Rotation: ______

Name of Faculty Supervisor: ________________________________________________

Start Date:_____________________________ End Date: __________________________

Advising and mentoring received from lab PI

Excellent  Good  Acceptable  Poor

Advising and mentoring received from other senior lab personnel

Excellent  Good  Acceptable  Poor

Fit with my research interests

Excellent  Good  Acceptable  Poor

Fit with lab’s environment (social, lab personalities, general work ethic...)  

Excellent  Good  Acceptable  Poor

How would you rate your performance during your rotation?

Excellent  Good  Acceptable  Poor

Overall experience

Excellent  Good  Acceptable  Poor

My advisor had reasonable expectations about what I could accomplish given the time constraints and other program commitments

Yes  No

Did the rotation achieve its objective of giving you a good sense of whether you would want to affiliate with this group?

Yes  No

I would want to affiliate with this lab for my dissertation research

Yes  No

Please comment on skills learned and progress made during the rotation.

Other general comments about your experience

Return to Liz Labriola

North Building

Room 102

liz.labriola@duke.edu
Graduate Program in Computational Biology & Bioinformatics (CBB)
Research Rotation Evaluation for Faculty

Student Name: _______________________________ Semester/Year of Rotation: _______

Name of Faculty Supervisor: _______________________________

Start Date: _______________________________ End Date: _______________________________

Technical skills
- Excellent
- Good
- Acceptable
- Poor

Attendance
- Excellent
- Good
- Acceptable
- Poor

Communication skills
- Excellent
- Good
- Acceptable
- Poor

Understanding of project
- Excellent
- Good
- Acceptable
- Poor

Motivation
- Excellent
- Good
- Acceptable
- Poor

How would you grade the student’s performance during the rotation?
- A
- B
- C
- F

Please comment on skills learned and progress made during the rotation.

Is the student a good fit for your group?

__________________________________________
Signature of Faculty Supervisor

__________________________________________
Date

Please Return Completed Form to
Liz Labriola:
liz.labriola@duke.edu
CBB Student Seminar Evaluation For Student Presentations

CIRCLE ALL TERMS ON A LINE THAT APPLY

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<tr>
<th>Background &amp; Significance:</th>
<th>Computational</th>
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<th>Unclear</th>
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<td>Most Defined</td>
<td>Few Defined</td>
<td>Confusing</td>
<td></td>
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<tr>
<td>Explanations</td>
<td>Very Clear</td>
<td>Mostly Clear</td>
<td>Some Clear</td>
<td>Confusing</td>
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<tr>
<td>Level of detail</td>
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<td>Mostly Right</td>
<td>Too Detailed</td>
<td>Not Enough</td>
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<td>Pace</td>
<td>Too Fast</td>
<td>Just Right</td>
<td>Too Slow</td>
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<td>Voice</td>
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<td>Monotone</td>
<td>Hard to Hear</td>
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<tr>
<td>Clarity</td>
<td>Good Diction</td>
<td>Fair Diction</td>
<td>Hard to Understand</td>
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<td>Delivery</td>
<td>Smooth</td>
<td>Verbal Pauses (e.g. um, uh)</td>
<td>Interrupted Sentences</td>
<td>Stammering</td>
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<td>Unattractive</td>
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<td>Just Right</td>
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<td>Graphics</td>
<td>Very Effective</td>
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<td>Poor resolution</td>
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<td>Too Busy</td>
<td>Too Small</td>
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| Overall Rating:           | Excellent     | Good       | Fair     | Poor     |

Specific Comments (please give examples used for above ratings):