



COMPUTATIONAL BIOLOGY & BIOINFORMATICS

A DUKE UNIVERSITY GRADUATE PROGRAM

Student Manual

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CBB FACULTY DIRECTORY

Director of CBB's NIH Training Grant, Bruce Donald
919/660-6583 (phone)

CBB Director, John Harer
John.Harer (at) duke.edu, 919/660-2845 (phone)

Director of Graduate Studies (DGS), Jeanette McCarthy,
jeanette.mccarthy (at) duke.edu, 919/668-5413 (phone)

Program Coordinator (DGSA), Jennifer Avery Anderson
Jennifer. Avery (at) duke.edu, 919/684-0881 (phone)

CBB Program Email Address: cbbdgs (at) duke.edu
Please use this email address when corresponding with
Jeanette and Jennifer on CBB matters.

CBB Graduate Program Faculty

Agarwal	Pankaj	http://www.cs.duke.edu/~pankaj/
Baugh	Ryan	http://www.biology.duke.edu/baughlab/
Benfey	Phillip	http://www.biology.duke.edu/benfeylab/
Beratan	David	http://fds.duke.edu/db/aas/Chemistry/faculty/david.beratan
Capel	Blanche	http://www.cellbio.duke.edu/Faculty/Capel/
Chan	Cliburn	http://biostat.duke.edu/modules/dukefaculty/viewDetails.php?d=chan0011&t=1
Chi	Jen-Tsan Ashley	http://www.genome.duke.edu/people/faculty/chi/
Clyde	Merlise	http://www.isds.duke.edu/~clyde/
Cowell	Lindsay	http://www.genome.duke.edu/genomelife/current/index.html/cowell
Crawford	Greg	http://www.genome.duke.edu/people/faculty/crawford/
Dave	Sandeep	http://www.genome.duke.edu/people/faculty/dave/
Dietrich	Fred	http://mgm.duke.edu/faculty/dietrich/
Donald	Bruce	http://www.cs.duke.edu/~brd/
Edelsbrunner	Herbert	http://www.cs.duke.edu/~edels/
Febbo	Phillip	http://www.genome.duke.edu/people/faculty/febbo/
Furey	Terry	http://www.genome.duke.edu/people/faculty/furey
Goldstein	David	http://www.genome.duke.edu/people/faculty/goldstein
Gregory	Simon	http://www.chg.duke.edu/faculty/sgregory.html
Haase	Steve	http://fds.duke.edu/db/aas/Biology/faculty/shaase
Harer	John	http://fds.duke.edu/db/aas/math/faculty/harer/
Hartemink	Alexander	http://www.cs.duke.edu/~amink/
Hauser	Elizabeth	http://www.chg.duke.edu/faculty/faculty/ehauser.html
Hellinga	Homme	http://www.biochem.duke.edu/Hellinga/hellinga.html
Iversen	Edwin	http://www.isds.duke.edu/~iversen/
Jarvis	Erich	http://neurobiology.mc.duke.edu/Faculty/jarvis/
Kelsoe	Garnett	https://faculty.duke.edu/faculty/info?pid=4391
Kepler	Tom	http://bioinformatics.duke.edu/dulci/index2.htm
Koelle	Katia	http://www.biology.duke.edu/koellelab/index.html
Layton	Anita	http://www.math.duke.edu/~alayton/
Lucas	Joseph	http://www.genome.duke.edu/people/faculty/lucas/
MacAlpine	David	http://www.genome.duke.edu/people/faculty/macalpine/
Magwene	Paul	http://www.genome.duke.edu/genomelife/glarchive/issue14/magwene
McCarthy	Jeanette	http://www.genome.duke.edu/people/faculty/mccarthy/
McClay	David	http://fds.duke.edu/db/aas/Biology/faculty/david.mcclay
Mukherjee	Sayan	http://www.genome.duke.edu/people/faculty/mukherjee
Nevins	Joseph	http://www.genome.duke.edu/people/faculty/nevins/
Nijhout	Frederik	http://www.biology.duke.edu/nijhout/
Noor	Mohamed	http://www.biology.duke.edu/noorlab/Noorlab.html
Oas	Terry	http://www.biochem.duke.edu/oas/oas.html
Ohler	Uwe	http://www.genome.duke.edu/people/faculty/ohler
Raghavachari	Sridhar	http://www.neuro.duke.edu/faculty/raghavachari/
Reed	Mike	http://www.math.duke.edu/~reed/
Richardson	David	http://kinemage.biochem.duke.edu/lab/Richardson/richardson.php
Richardson	Jane	http://kinemage.biochem.duke.edu/lab/Richardson/richardson.php
Schmidler	Scott	http://www.stat.duke.edu/~scs/
Socular	Joshua	http://www.phy.duke.edu/~socular/
Tian	Jingdong	http://www.bme.duke.edu/faculty/tian/index.php
Tomaras	Georgia	https://faculty.duke.edu/faculty/info?pid=4347
Uyenoyama	Marcy	http://fds.duke.edu/db/aas/Biology/faculty/marcy
West	Mike	http://www.isds.duke.edu/~mw/
Willard	Huntington	http://www.genome.duke.edu/people/faculty/willard
Wray	Greg	http://www.genome.duke.edu/people/faculty/wray/
Yang	Weitao	http://fds.duke.edu/db/aas/Chemistry/faculty/weitao.yang
You	Lingchong	http://www.genome.duke.edu/people/faculty/you
Zhu	Jun	http://www.genome.duke.edu/people/faculty/zhu/

CBB STUDENT TIMELINE

1st Year

Third week in August	Orientation week: Program Reception, Faculty Research Talks, Advisory Committee Meeting, Course Registration.
Weekend before fall semester starts	Responsible Conduct in Research training at Duke Marine Lab.
Friday, first week of classes	Submit fall semester rotation request to DGSA.
September	CBB Student Retreat
November	Meet with Advisory Committee, register for spring semester courses.
December	Submit spring semester rotation request to DGSA.
April	Meet with Advisory Committee, register for fall semester courses.
Before April 15 th	Submit Progress Report Form to DGSA.
May	Submit summer semester rotation request to DGSA.

2nd Year

August	Submit fall semester rotation request to DGSA.
September	CBB Student Retreat
Before Dec. 1st	Submit Dissertation Advisor/Co-advisor Selection Form & Dissertation Student Commitment Form to DGSA.
Before Feb. 1 st	Submit Committee Approval Form to DGSA.
Before April 15 th	Submit Progress Report Form to DGSA.
Before May 1st	Meet with Prelim Committee (Dissertation Committee) to prepare for prelim exam.

3rd Year

September	CBB Student Retreat
Before Sept. 15th	Pick up prelim exam materials from DGSA.
Before Oct 15th	Submit written proposal to DGSA (important) and Prelim Committee.
Before 1st Fri. in November	Student completes acceptable written proposal, schedules oral exam and <i>informs DGSA of date</i> .
Before end of Fall Semester	Oral exam takes place contingent on approved written proposal.
Before April 15 th	Submit Progress Report Form to DGSA.

Subsequent Years

September	CBB Student Retreat
Before end of fall semester	Annual meeting with dissertation committee. One – two page summary of progress toward dissertation should be submitted to committee prior to meeting.
Before April 15th	Submit Progress Report Form to DGSA.

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 directly admitted to the CBB Graduate Program complete the following three core courses:

- CBB 220 Genomic Tools and Technologies, 3 units
- CBB 261, 262, 263A or 263B Algorithms in Computational Biology, 3 units
- CBB 240 Statistical Methods for Computational Biology, 3 units

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 (see next page.) 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 only limited 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

CBB 210 Computational Biology Seminar, 1 unit - All first and second year CBB Doctoral Students are required to register for this class during their first and second years. All other students are expected to attend regularly. Students in their third year and beyond present one 50-minute seminar at least once during their training

Rotations

During their first year in residence, students should complete at least three "research rotations", each consisting of a tutorial-level independent study or laboratory experience with different faculty members in the CBB Program. 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 are arranged only in unusual circumstances and must be approved in advance by the DGS. Students are strongly encouraged to select one rotation experience with a primarily experimental faculty member and at least one with a primarily computational faculty member. Typically, the duration of each rotation is one semester. Each student should plan to submit a CBB Student Research Rotation Evaluation Form. The rotation advisor will be asked to complete a [Rotation Evaluation Form](#) at the end of the semester. The rotation advisor may request a written report or oral group meeting presentation.

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 above).
2. Take for a grade one additional CBB course.
3. Register for CBB 210, Computational Biology and Bioinformatics Seminar, for at least 4 semesters.
4. Appoint at least one member of the CBB faculty to their dissertation committee.

Computational Biology and Bioinformatics Courses

Course No.	Title	Cr	Instructor(s)
CBB210	Computational Biology Seminar	1	Oas
CBB211	Journal Club/Research in Progress	1	Furey
CBB212	Responsible Genomics (PUBPOL264)	3	Cook-Deegan
STA213	Introduction to Statistical Methods	3	Statistics Faculty
COMPSCI230	Design and Analysis of Algorithms	3	CompSci Faculty
CBB218	Genetics and Molecular Biology (BIOL118)	4	Haase/Sun
CBB219	Cell & Developmental Biology (BIOL119)	4	McClay/Pei
CBB220	Genomic Tools and Technologies	3	Dietrich
CBB221	Gene Expression Analysis	3	Chi/Lucas
CBB222	Genome Science & Technology Lab (BME258L)	1	Nijhout
CBB223	Computational Immunology	3	Kepler/ Cowell
CBB225	Core Concepts Bridging Genomic and Comp. Bio.	2	Febbo
CBB240	Statistical Methods for Computational Biology	3	Mukherjee
CBB241	Statistical Genetics	3	Hauser
STA214	Probability and Statistical Models	3	Statistics Faculty
STA215	Statistical Inference	3	Statistics Faculty
STA244	Linear Models	3	Statistics Faculty
CBB252	Structural Biology of Macromolecules (SBB222)	3	Richardsons
CBB258	Structural Biochemistry I (SBB258)	2	Beese
CBB259	Structural Biochemistry II (SBB259)	2	Hellinga
CBB261	Computational Sequence Biology	3	Ohler
CBB262	Computational Systems Biology	3	Hartemink
CBB263A	Algorithms in Structural Biology and Biophysics	3	Donald
CBB263B	Computational Structural Biology	3	Schmidler
CBB264	Computational Geometry (CPS234)	3	Edelsbruner/Agrawal
CBB265	Advanced Database Systems (CPS216)	3	Computer Sci. Faculty

Bold: CBB Core Courses

STUDENT ADVISING

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 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:

Jeanette McCarthy	jeanette.mccarthy (at) duke.edu
Ryan Baugh	ryan.baugh (at) duke.edu
Bruce Donald	bruce.donald (at) duke.edu
Sayan Mukherjee	sayan (at) stat.duke.edu
Uwe Ohler	uwe.ohler (at) duke.edu
Beth Hauser	elizabeth.hauser (at) duke.edu
Fred Dietrich	dietr003 (at) duke.edu
David Richardson	dcr (at) kinemage.biochem.duke.edu
John Harer	john.harer (at) duke.edu

Dissertation Advisor(s) and Committee:

Typically, before the end of the 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 both advisors represent both computational and experimental science. The [Dissertation Advisor Association Forms](#) should be filled out and signed by the student and advisor(s) and submitted to the DGSA by December 1st.

Early in the spring semester the student forms a permanent dissertation advisory committee, in consultation with their advisor(s). The dissertation advisory committee consists of five faculty, including advisor(s). At least three committee members must be members of the [CBB Graduate Program Faculty](#) and one member (minor area representative) must be from a department outside of those of the advisor(s). 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 DGSA by February 1st.

The dissertation committee advises the student about additional courses, oversees their PhD research, and guides the student in preparing for the Preliminary Examination during a meeting scheduled sometime during the spring semester of the student's second year. The [Preliminary Exam](#) will be conducted by the dissertation committee in the fall 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 their 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 DGSA along with the [Annual Progress Report](#) before April 15th.

Annual Progress Reports

In an effort to monitor student progress towards the degree, the CBB Program requires all doctoral students to file an [Annual Progress Report](#) with their DGS. This report is due to the DGSA no later than April 15th of each year.

CBB STUDENT INFORMATION

CBB Student Directory

CBB 2003 Entering Class

Jeffrey J. Headd Jeffrey.Headd (at) duke.edu
Curtis Layton cjl12 (at) duke.edu

CBB 2005 Entering Class

Alan Boyle alan.boyle (at) duke.edu
Stoyan Georgiev stoyan.georgiev (at) duke.edu
Justin Guinney justin.guinney (at) duke.edu
Ken Yokoyama ken.yokoyama (at) duke.edu

CBB 2005 Entering Class

Alan Boyle alan.boyle (at) duke.edu
Stoyan Georgiev stoyan.georgiev (at) duke.edu
Justin Guinney justin.guinney (at) duke.edu
Ken Yokoyama ken.yokoyama (at) duke.edu

CBB 2009 Entering Class

Ashlee Benjamin ashlee.benjamin (at) duke.edu
Chris Castorena chris.castorena (at) duke.edu
Anastasia Deckard anastasia.deckard (at) duke.edu
Peng Dong peng.dong (at) duke.edu
Annchen Knodt annchen.knodt (at) duke.edu
Anirudh Natarajan anirudh.natarajan (at) duke.edu
Chetan Rupakheti chetan.rupakheti (at) duke.edu
George Tretyakov george.tretyakov (at) duke.edu
Cavin Ward-Caviness cavin.ward-caviness (at) duke.edu
Yi Zhao yi.zhao (at) duke.edu

CBB 2004 Entering Class

Ana Paula Sales ad44 (at) duke.edu
Nicole Johnson nicole.johnson (at) duke.edu
Supriya Munshaw sm87 (at) duke.edu
Elizabeth Rach elizabeth.rach (at) duke.edu
Rui Wang rw24 (at) duke.edu
Todd Wasson tsw5 (at) duke.edu

CBB 2006 Entering Class

Xianrui Cheng xianrui.cheng (at) duke.edu
Matt Eaton matthew.eaton (at) duke.edu
Nicky Lekprasert parawee.lekprasert (at) duke.edu
Andreas Pfenning andreas.pfenning (at) duke.edu

CBB 2008 Entering Class

Brian Bennett brian.bennet (at) duke.edu
Jacob Frelinger jacob.frelinger (at) duke.edu
Diana Fusco diana.fusco (at) duke.edu
Swati Jain swati.jain (at) duke.edu
Michael Mayhew michael.mayhew (at) duke.edu
Chern-Han Ou chern-han.ou (at) duke.edu
Nathan Sheffield nathan.sheffield (at) duke.edu
Deborah Winter deborah.winter (at) duke.edu
Lingling Zheng lingling.zheng (at) duke.edu
Gurkan Yardimci ggy (at) duke.edu

CBB Certificate Students

Xin Guo xin.guo (at) duke.edu
Karen Hayden Karen.Hayden (at) duke.edu
Maggie Quan jq7 (at) duke.edu
Faisal Reza faisal.reza (at) duke.edu
Josh Robinson josh (at) cs.duke.edu
Bei Wang bw25 (at) duke.edu

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 one or all of the members of the committee. The committee is elected from the second and third year students willing to serve a two year term.

2008 - 2009 Student Committee Members

Hsiang-Yu Yuan
Nicky Lekprasert
Matt Eaton
Andreas Pfenning

CBB Student Listserv [cbbstudents \(at\) duke.edu](mailto:cbbstudents@duke.edu)

The CBB student listserv is available for inter-student communication and distribution of messages from the DGSA. [cbbdgs \(at\) duke.edu](mailto:cbbdgs@duke.edu) is the only non-student member.

PROGRAM INFORMATION AND POLICIES

DGS Office

The DGS and DGSA 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 contact either the DGS or DGSA to schedule an individual appointment.

Office of Graduate Student Affairs

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.

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. Prime examples of the outcomes of GSA advocacy include the funding secured for a [Childcare Subsidy](#) for graduate student parents and the creation of a [Dean's Award for Excellence in Mentoring](#) to spearhead a broad mentoring initiative in the Graduate School.

http://www.gradschool.duke.edu/student_life/, Grad-gsa (at) duke.edu, 919/684-2056

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://www.krellinst.org/csgf/index.shtml>, for more information.

CBB Retreat and IGSP Retreat

During September, the CBB Program holds a student retreat, which is organized by the student committee with assistance from the DGS and DGSA. The retreat is an opportunity for students to learn about each other's research, brainstorm solutions to scientific problems, earn RCR credit and socialize. All students are expected to attend and participate in planned activities.

In addition, each fall the Institute for Genome Sciences & Policy (IGSP) holds its annual retreat. All first and second year CBB students are invited and urged to attend. (CBB students in later years who are members of IGSP laboratories and groups will be invited as part of those groups.)

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 DGSA 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: http://www.gradschool.duke.edu/financial_support/conftrav.pdf.

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 the beginning of the fourth semester in residence. Beginning July 1st of the second year in residence, the faculty advisor will become responsible for the student's stipend and fees for the duration of the student's dissertation work. [Dissertation Advisor Association Forms](#) found in the Appendix must be submitted to the DGSA by December 1 of the student's second 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.

Teaching Opportunities

Teaching is not a degree requirement for CBB PhD students. However, students who wish to teach should contact the DGS at least one semester before the semester they are available to teach. The DGS will coordinate with CBB course instructors to match the student with the instructor. This opportunity is available on a strictly volunteer basis and no financial compensation is offered.

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. If this is not possible, the DGSA will either enlarge or shrink your poster to fit the 42 inch margin.
- 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 DGSA to print your poster.
- When you are ready to print, email your file to the DGSA. If your file is too large to send over email, save your file to a memory stick and come to 101A North Building at your scheduled printing time.
- When you email your poster for printing, please include the fund code to charge for the \$25 fee.
- It takes between 30 – 45 minutes to print the final copy of your poster, so plan accordingly!

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 three RCR Forums within the first three years of his/her program is also required. There will be a CBB-specific RCR Forum at each Student Retreat, which is officially sanctioned by the Graduate School. In the event that a student misses this forum, the schedule of Graduate School-sponsored RCR Forums will be provided at the beginning of each semester on the Graduate School's website, www.gradschool.duke.edu. 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.

Registration

Detailed instructions on how to register for courses are available at:

<http://www.registrar.duke.edu/registrar/studentpages/student/registrationinfo.html>.

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.

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://www.registrar.duke.edu/registrar/studentpages/student/interinstitutional.html>.

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://www.registrar.duke.edu/registrar/studentpages/student/transcriptinfo.htm>.

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, www.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, at: http://www.gradschool.duke.edu/policies_and_forms/dissertation.pdf. 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 on or before April 1st preceding the May commencement, ten days before the end of the Duke summer session for a September degree, or ten days before the end of the fall semester for a December degree. The dissertation must be submitted to the Graduate School office at least seven days before the scheduled date of the student's examination.

Graduation

Please consult the Graduate School's [Graduation Website](#) 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.

SYSTEM ADMINISTRATION AND NETWORK POLICY

1. All program students will be granted user accounts within a CBB administrative domain of the IGSP. 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,
 - e. and will permit over-network execution of all IGSP-developed or -administered software packages,
 - f. but will not permit root access to users.
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 and IGSP 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://www.oit.duke.edu/oit/policy/CompNet.html>.
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 of the IGSP).
7. All personal web site development will comply with policies outlined at http://www.oit.duke.edu/ows/duke_web_services.html. Third level domain name applications are made exclusively through IGSP network administrators as authorized by the CBB executive committee.

PRELIMINARY EXAM PROCEDURE

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. According to Graduate School Rules, this committee must be approved at least two months before the date of the oral prelim exam. The prelim committee is chaired by a member of the CBB Advisory Committee (AC). If none of the dissertation committee members are members of the AC, the DGS serves as chair.
3. **Pre-prelim Meeting.** The student arranges a meeting with the prelim committee sometime during 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. 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. A one page summary of the presentation should be submitted to each committee member and the DGSA no later than two days before the scheduled meeting.
4. **Written proposal distribution.** Before October 15th in the student's third year and at least four weeks prior to the planned oral exam, 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 [copy of these instructions](#), [cover sheet](#), [written evaluation form](#) and [written preliminary exam format](#) attached. **A hard copy of the cover sheet and the document should also be submitted to the DGSA.**
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 scheduling.** Once the proposal has been accepted by the entire committee, the oral exam is scheduled by the student. The exam must take place while classes are in session, which includes exam periods.
7. **Oral exam procedure.** During the oral exam, the student presents a 20 minute 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 area of computational biology with which the student should be familiar.
8. **Preliminary Exam Evaluation.** After all committee members have asked all of their questions and the exam has proceeded for at least two hours, but not more than three, the student is asked to leave the room. The committee discusses the exam, both written and oral components, and votes by paper ballot 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.

WRITTEN PRELIMINARY EXAM FORMAT (Based on NIH Form PHS 398 Instructions)

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 15 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 pre-sent 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 Faculty Research Rotation Evaluation Form

Graduate Program in Computational Biology & Bioinformatics (CBB)

To be completed by Faculty Supervisor:

Student Name: _____ **Semester/Year of Rotation:** _____

Name of Faculty Supervisor: _____

Start Date: _____ **End Date:** _____

Technical skills	Poor	Acceptable	Good	Excellent
Attendance	Poor	Acceptable	Good	Excellent
Communication skills	Poor	Acceptable	Good	Excellent
Understanding of project	Poor	Acceptable	Good	Excellent
Motivation	Poor	Acceptable	Good	Excellent

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 the Program Coordinator:

Jennifer Avery
Box 90090
919/684-0881 (phone)
919/668-2465 (fax)
cbbdgs@duke.edu

CBB Student Research Rotation Evaluation

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

FIRST YEAR PROGRESS REPORT FORM

Name: _____

CBB Core Courses Completed To Date:

- CBB 220 Genomic Tools & Technologies _____
- CBB 230/261/262/263 Algorithms in Computational Biology _____
- CBB 240 Statistical Methods for Comp. Biology _____

Elective Courses Completed This Academic Year:

Planned Courses for Year Two:

Rotations Completed This Academic Year:

<u>Semester/Yr</u>	<u>Faculty</u>	<u>Wet/Dry</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____

Anticipated Summer Rotation:

Research Related Activities:

Please include: talks or posters presented; conferences attended; collaborations with post-doctoral fellows and/or faculty; publications; applications to programs (summer schools, fellowships, grants, ...)

Signature: _____

Date: _____

Please return to Jennifer Avery
Rm. 102 North, Fax 668-2465

SECOND YEAR PROGRESS REPORT FORM

Name: _____

CBB Core Courses Completed To Date:

CBB 220 Genomic Tools & Technologies _____
CBB 230/261/262/263 Algorithms in Computational Biology _____
CBB 240 Statistical Methods for Comp. Biology _____

Elective Courses Taken This Academic Year:

Planned Courses for Year Three:

Rotations Completed Since May of Last Year:

<u>Semester/Yr</u>	<u>Faculty</u>	<u>Wet/Dry</u>
_____	_____	_____
_____	_____	_____

Association Process:

_____ Dissertation Association Forms Submitted (if not, please state reason and expected date)

_____ Dissertation Committee Approval Form Submitted (if not, please state reason and expected date)

Preliminary Exam Preparations

Date of pre-prelim meeting (actual or target): _____

Target date of preliminary exam: _____

Summer Plans:

Research Related Activities:

Please include: talks or posters presented; conferences attended; collaborations with post-doctoral fellows and/or faculty; publications; Applications to programs (summer schools, fellowships, grants, ...)

Signature: _____

Date: _____

Please return to Jennifer Avery
Rm. 102 North, Fax 668-2465

THIRD YEAR PROGRESS REPORT FORM

Name: _____

Courses Taken This Academic Year:

Planned Courses for Year Four:

Preliminary Exam Completed:

Yes ___

No ___ Semester/yr of planned exam _____

Date of Most Recent Committee Meeting: _____

Research Related Activities:

Please include: talks or posters presented; conferences attended; collaborations with post-doctoral fellows and/or faculty; publications; applications to programs (summer schools, fellowships, grants, ...)

Signature: _____

Date: _____

Please return to Jennifer Avery
Rm. 102 North, Fax 668-2465

FOURTH YEAR & BEYOND PROGRESS REPORT FORM

Name: _____

Courses Taken This Academic Year:

Date of Most Recent Committee Meeting: _____

Thesis:

If you have begun work on your thesis document, please attach a brief outline of thesis research, a summary of any portions of completed written work & a timeline for completion of remaining thesis chapters. If you have not yet begun to prepare the document, please give a list of chapters or manuscripts that will be converted to chapters in their most likely order.

Target Date for Final Defense (if known): _____

Research Related Activities:

Please include: talks or posters presented; conferences attended; collaborations with post-doctoral fellows and/or faculty; publications; applications to programs (summer schools, fellowships, grants, ...)

Signature: _____

Date: _____

Please return to Jennifer Avery
Rm. 102 North, Fax 668-2465

**DISSERTATION ADVISOR ASSOCIATION
FACULTY CO-ADVISOR COMMITMENT FORM**

TO: Huntington F. Willard
Director, Program in Computational Biology and Bioinformatics
Director, Institute for Genome Sciences & Policy
Room 2379 CIEMAS
Durham, NC 27708

FROM: _____
Faculty Name
E-mail address

Box Number
Campus Phone Number

Physical Location on Campus

Date
July 1, _____
Departmental Funding Start Date

RE: _____
Student Name

This memo is to notify the Program in Computational Biology and Bioinformatics that I have agreed to act as dissertation co-advisor for the student named above. I assure that the student will receive regular guidance from me toward timely and successful completion of the degree requirements of the Program and the Graduate School.

Check all that apply:

- I agree to help provide resources necessary for the above named student to perform dissertation research under my direct supervision.
- I agree to share with the primary advisor the responsibility of providing funds to cover the student's stipend and fees for the duration of the student's dissertation work under my supervision.
- I agree that my department will provide space for the student to conduct his/her research throughout their work under my supervision.
- I do not make any financial commitment to support the above named student.
- I do not agree to make available space specifically designated for the student's research.

Co-Advisor Printed Name

Co-Advisor Signature

Date

Department/Division Chair Printed Name

Department/Division Chair Signature

Date

COMMITTEE APPROVAL FORM

Date: _____

Submit to: Associate Dean
Graduate School
127 Allen Building
Duke University

Approval is requested for the following Advisory Committee for:

Student's Name: _____

Department Name: _____

for the students: Ph.D. **preliminary** examination Ph.D. **final** examination
 A.M./M.S. examination

Professor's Full Name

Rank/Title

Department

(Committee Chair)

► **REQUIRED – MINOR AREA REPRESENTATIVE** (Please enter on above line)

*If the advisor and chair are not the same person, please identify the advisor with an *.*

The above listing is (please check one):

- original committee request.
 change in the student's previously approved committee.

We understand that members of a graduate student's advisory committee must be approved for graduate instruction or graduate faculty, and that any committee member now on the faculty of another institution should be a member of that institution's graduate faculty. The institution's name is listed for any non-Duke member.

Submitted by: _____

Date: _____

Director of Graduate Studies

Approved by: _____

Date: _____

Associate Dean, Graduate School

RECORD OF PRE-PRELIM MEETING

Student: _____ **Date of Meeting:** _____

Signatures of Participating Faculty:

(Chair, AC member)

Remarks (please indicate target prelim date):

Return form along with printed summary sheet with student's folder to:

Jennifer Avery
102 North Building
Box 90090
Fax: 668-2465

WRITTEN PRELIMINARY EXAMINATION COVER SHEET

(Attach to each committee member's copy)

Student: Name

E-mail

Mentor:

Date comments due to Advisory Committee Member (ACM):
(within one week of delivery)

Note: All comments should be given directly to the ACM (see below). If modifications are requested, the ACM will coordinate communicating the requested changes to the student and mentor.

Committee	Name	E-mail Address	Phone	Date Delivered
ACM/Chair				
Member 2				
Member 3				
Member 4				
Member 5				

Target Preliminary Examination Date:

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

Jennifer Avery
102 North Building
Box 90090, Duke Campus
Fax 668-2465

WRITTEN PRELIMINARY EXAMINATION EVALUATION FORM

To be submitted to student and advisor at the oral Preliminary Examination

Student:

Committee Member:

PART A – WRITTEN PROPOSAL

1=excellent 2=satisfactory 3=unsatisfactory

General

Is the overall written document acceptable for defense?

yes **no**

Writing Style

Clarity/Focus

Background & Significance

Definition of Problem(s)

Background Information

Research Plan & Preliminary Results

Experimental Design

Research Accomplished

Overall Evaluation of the Written Proposal

Comments (continue on back if necessary)

Note to Advisor: Please review completed forms with student after oral exam, then return them to Jennifer Avery, room 102 North Building, Campus Box 90090, fax 668-2465.

ORAL PRELIMINARY EXAMINATION EVALUATION FORM

Student:

Committee Member:

PART B – ORAL DEFENSE

1=excellent 2=satisfactory 3=unsatisfactory

Quality of Oral Presentation

Response to Questions

General Knowledge and Familiarity with Material

Defense of Research Plan

Overall Evaluation of the Oral Defense

Comments (continue on back if necessary)

OVERALL EVALUATION (parts A + B)

Note to Advisor: Please review completed forms with student after oral exam, then return them to Jennifer Avery, room 102 North Building, Campus Box 90090, fax 668-2465.

RECORD OF ANNUAL PROGRESS MEETING

Student: _____ **Date of Meeting:** _____

Signatures of Participating Faculty:

(Dissertation Advisor)

Remarks (please indicate target defense date, if discussed):

Return form to:

Jennifer Avery
102 North Building
Box 90090
Fax: 668-2465