

THE UNIVERSITY OF KANSAS  
CENTER FOR COMPUTATIONAL BIOLOGY  
HANDBOOK

FALL 2018

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[compbio.ku.edu](http://compbio.ku.edu)



Lawrence, KS

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*\*1st Year*

## KEY OFFICES AT KU

The Director of Graduate Studies is your first stop for any questions related to graduate study or requirements. Our Director of Graduate Studies is Christian Ray. If you would like to research an issue in advance of speaking with the Director of Graduate Studies or if you still have questions, the following document provides assistance:

[clas.drupal.ku.edu/sites/clas.ku.edu/files/docs/COGA/KEY OFFICES AT KU \(FINAL\).pdf](http://clas.drupal.ku.edu/sites/clas.ku.edu/files/docs/COGA/KEY OFFICES AT KU (FINAL).pdf)

## PROGRAM INFORMATION

### I. GRADUATE PROGRAM PROGRESS TO DEGREE

#### **Goal and objectives**

The goal of graduate education for the Ph.D. degree within the Computational Biology Program is to enhance students' academic knowledge base, teaching ability, communication ability, and in-depth basic research ability within a particular scientific area in the discipline.

#### **Year One**

The student will begin taking formal courses to fulfill requirements for the degree, including the Bioinformatics core course. At least two individual lab rotations are required for each new graduate student during the first year of graduate study. By the end of the first year the student will select the thesis Advisor. During the first and subsequent years, the student is required to attend the weekly Computational Biology seminar series. The student is also required to participate in the Computational Biology Student Seminar series.

#### **Year Two**

By the end of the second year, the student will have completed the formal course work to fulfill requirements for the degree. The student will complete and submit a research proposal for the Comprehensive Oral Exam. This proposal will be written in the format of a National Institutes of Health (NIH) or National Science Foundation (NSF) grant proposal. The proposal must develop a research topic related to the general areas of computational biology. The topic of the research proposal is decided upon by the student in consultation with the thesis Advisor.

#### **Subsequent Years**

Upon completion of the Comprehensive Oral Exam, the student will aggressively carry out research in the laboratory of the thesis Advisor. In addition, the student will continue attending the weekly Computational Biology seminar series and participating in the Computational Biology Student Seminar series.

A PhD degree is awarded once the student has written a final dissertation and carried out a successful defense of it before a committee.

## II. POLICIES AND PROCEDURES

### A. Research Laboratory Rotations for New Students

Faculty Talks – All faculty members who are interested in taking a rotation student will have the opportunity to speak with new students. Faculty talks will take place the first week of classes.

Selection of Rotations – New students will contact faculty members directly to set up appointments to discuss research and possible lab rotations.

After agreeing to rotations with faculty, new students will turn in to the Director of Graduate Studies the names of the faculty members in whose labs you wish to rotate. Each lab rotation will last approximately nine weeks, scheduled as follows:

#### 1st Rotation

8/27/2018 – 10/26/2018

#### 2nd Rotation

10/29/2018 – 1/18/2019

#### 3rd Rotation

1/22/2019 – 3/22/2019

Completion of Rotations – By the end of the third rotation, submit to the Director of Graduate Studies a ranked list of faculty members with whom you would like to work. Every effort will be made to allow you to join your first-choice lab, although there must be mutual agreement between the student and faculty member. This mutual agreement will depend on your effort and performance during the rotation, the availability of continued financial support, the availability of space within the lab, and so on. If the first choice cannot be fulfilled, the second choice will be examined under the same constraints. Once a mutual agreement has been reached, new students will officially join research labs. If, after the end of the first year, a student has not identified a Major Advisor for research, the student will be dismissed from the graduate program.

In rare instances a situation may arise such that you, your advisor, or both desire a change in advisor. Before any action is taken by either party, the Director of Graduate Studies and your Graduate Committee will be apprised of the situation and discussion of the issue initiated. A resolution will be reached in a timely manner.

### B. Enrollment Requirements

K.U. has on-line enrollment. Check out the Graduate Studies Enrollment page at [graduate.ku.edu/enrollment](http://graduate.ku.edu/enrollment) and follow along.

The Computational Biology Program has established a minimum credit hour level of enrollment that is appropriate for normal progress (i.e., course work and research effort) and which is representative of faculty time required for a student's work towards an advanced degree. These requirements must equal, and may exceed, the minimum credit hour enrollment limit set by Graduate Studies. Program enrollment requirements are as follows:

#### 1. Ph.D. Enrollment Hours: Pre-Comprehensive Oral

Students who have not yet passed the Comprehensive Oral Exam are expected to enroll in at least 9 credit hours each fall and spring semester and 3 credit hours each summer session.

#### 2. Ph.D. Enrollment Hours: 18-Hour Post-Comp Rule

After passing the Comprehensive Oral Exam, you must be continuously enrolled, including summer sessions, until all degree requirements are completed. According to Graduate Studies regulations, for the first 18 hours of post-comprehensive enrollment, the doctoral student must enroll in a minimum of 6 credit hours per semester and 3 credit hours per summer session.

### 3. Ph.D. Enrollment Hours: Beyond the 18-Hour Post-Comp Rule

Students who have completed the 18-Hour Post-Comp requirement are now eligible to enroll in fewer than 6 hours per semester, as long as some of these are for dissertation credit (BINF 999). Before you do this, please see the Director of Graduate Studies to complete the necessary form.

### **C. Academic Performance**

Grading Systems - Graduate courses use the ABCDF grading system or the SU performance criteria (S = satisfactory performance and U = unsatisfactory performance). Thesis and dissertation research courses are graded with the latter.

Academic Standing - Only grades of "A" or "B" in graduate courses are considered satisfactory. If a grade of "C" or below is obtained, you will not receive graduate credit for this course and the course must be retaken. If your cumulative grade-point average falls below "B" (3.0 on a 4.0 scale), you are automatically placed on academic probation and will be required to raise your cumulative grade-point average to at least a "B" (3.0) during the next semester. If, after the second semester, a student who has probationary status fails to maintain a "B" (3.0) cumulative grade point average, the student will be dismissed from the graduate program. Grades such as "P", "S", "U" and "I" are omitted from these calculations. You will not be allowed to hold a GTA or GRA appointment until probationary status has been removed.

### **D. Graduate Assistantships**

The following mechanisms are available for graduate assistantship:

Graduate Fellowship: Competitive graduate fellowships are available, including University Graduate Fellowships ([graduate.ku.edu/university-graduate-fellowships](http://graduate.ku.edu/university-graduate-fellowships)) and the Madison & Lila Self Graduate Fellowship ([selfgraduate.ku.edu](http://selfgraduate.ku.edu)). Applications should be coordinated with the Director of Graduate Studies.

Graduate Teaching Assistantships (GTAs): GTAs are provided on a semester-by-semester basis. Students holding these appointments must make arrangements with their Major Advisor for summer appointments. The specific GTA is set by Program requirements and expertise of the student.

Graduate Research Assistantships (GRAs): Individual faculty may have Graduate Research Assistantships (GRAs) available from grant funds. GRAs are appointed for one semester at a time.

### **E. Tuition and Fees**

If you hold a GTA slot, the University will pay your tuition plus 3 graduate credit hours of campus fees.

If you hold a GRA slot, your mentor is responsible for paying your tuition. Please be sure to consult with your mentor in advance of payment deadlines. You are also re-

quired to complete a Staff Tuition Rates Form for EVERY semester that you hold a GRA appointment.

### **F. Progress to Degree Forms**

The Progress to Degree form (PTD) enables the University to track and collect vital information about students' progress to degree. Upon receiving the information from you, the Director of Graduate Studies will complete the necessary PTD form and forward it to Graduate Studies for approval. Thus, it is very important that you contact the Director of Graduate Studies when you do ANY of the following: change degree status, form a committee, hold a committee meeting, schedule an exam, schedule a seminar, schedule a defense, or change degree program. If you're not sure about something, please check with the Director of Graduate Studies.

### **G. Seminars**

All graduate students will be expected to attend Center for Computational Biology seminars. These are generally speakers from outside the University, scheduled on some Tuesdays at 1:00 p.m. in the Computational Biology seminar room in MRB (unless otherwise noted).

### **H. Policy on Switching Advisors**

Students may switch advisor after a discussion with the Director of Graduate Studies and/or the Program Director.

Changing advisors may become necessary if the mentor leaves KU, retires, in cases of funding decrease, or loss of interpersonal and academic compatibility.

Students who need additional support may contact College Office of Graduate Affairs (<https://coga.ku.edu>) or Ombudsman (<https://ombuds.ku.edu>).

### **I. University Policies and Degree Requirements**

For up-to-date CLAS- and University-level degree requirements, consult the official COGA UNIVERSITY POLICIES & DEGREE REQUIREMENTS document: [clas.drupal.ku.edu/sites/clas.ku.edu/files/docs/COGA/UNIVERSITY POLICIES AND DEGREE REQUIREMENTS \(FINAL\).pdf](https://clas.drupal.ku.edu/sites/clas.ku.edu/files/docs/COGA/UNIVERSITY%20POLICIES%20AND%20DEGREE%20REQUIREMENTS%20(FINAL).pdf)

### III. CURRICULUM

#### A. Computational Biology Core Courses

##### First Year Computational Biology Core Course

BINF 701 /702 is the Computational Biology core course developed at the KU Center for Computational Biology. The course is designed to introduce the most important and basic concepts, methods, and tools used in computational biology. Topics include (but not limited to) bioinformatics databases, sequence and structure alignment, protein structure prediction, protein folding, protein-protein interaction, Monte Carlo simulation, protein design, dynamical systems, and systems biology. Emphasis will be put on the understanding and utilization of these concepts and algorithms. We also discuss in detail the application of these algorithms to interesting problems in gene regulation, signaling networks, macromolecular self-assembly, and drug design. The objective is to help the students to rapidly reach the frontier of computational biology and be able to use the computational tools to solve problems in their own research. For more information about these courses please contact Christian Ray. Email: [jjray@ku.edu](mailto:jjray@ku.edu).

#### B. Required Courses

BINF 701	Computational Biology Core I (5)
BINF 702	Computational Biology Core II (5)
BINF 709	Topics in Bioinformatics
BIOL 636	Biochemistry I (3)
BIOL 638	Biochemistry II (3)
BIOL 804	Issues in Scientific Integrity (1)
or	
CHEM 700	Responsible Scholarship in Chemical Sciences(1)
or	
MDCM 801	Issues in Scientific Integrity (1)
BINF 999	Dissertation Research (1-18)

### **C. Suggested Elective Courses**

To determine what elective courses to take, talk to your advisor or the Director of Graduate Studies.

#### **Biology/Chemistry**

- BIOL 772      Gene Expression (3)
- CHEM 622      Fundamentals of Organic Chemistry (3)
- CHEM 640      Biological Physical Chemistry (3)

#### **Analysis/Mathematics/Statistics**

- C&PE 778      Applied Optimization Methods (3)
- MATH 526      Applied Mathematical Statistics I (3)
- MATH 530      Mathematical Models I (3)
- MATH 581      Numerical Methods (3)
- MATH 590      Linear Algebra (3)
- MATH 605      Applied Regression Analysis (3)
- MATH 727      Probability Theory (3)
- MATH 728      Statistical Theory (3)
- MATH 781      Numerical Analysis I (3)
- MATH 865      Introduction to Stochastic Processes (3)
- EECS 638      Fundamentals of Expert Systems (3)
- EECS 647      Introduction to Database Systems (3)
- EECS 739      Scientific Parallel Computing (3)
- BIOL 841      Biometry I (5)
- BIOL 842      Biometry II (3)

## RESOURCES

**Applied English Center** – The Applied English Center (AEC) offers assistance to international students through courses and testing. The SPEAK test is administered through this office. Contact them in 204 Lippincott Hall, 864-4606 or visit their website at [aec.ku.edu](http://aec.ku.edu).

**Bookstores** – Textbooks can be purchased at the following bookstores or can be preordered online at their respective websites:

KU Bookstore, Kansas Union, Level Two (864-4640) KU Bookstore, Burge Union, Level Two (864-5697); [kubookstore.com](http://kubookstore.com)

**Center for Teaching Excellence** – The mission of the Center for Teaching Excellence (CTE) is to support excellence in teaching by graduate students and faculty. Throughout the year, CTE hosts various workshops, teaching conferences, and discussion forums. They also have print and video resources for GTAs. The center sponsors the annual GTA Teaching conference each fall and spring semester. For further information, call 864- 4199 or visit [cte.ku.edu](http://cte.ku.edu).

**Child Care** – Graduate students with children are eligible to apply for child care placement at three university facilities: Hilltop Child Development Center, Sunnyside Infant & Toddler Program, and Educare. Hilltop cares for children from one to five years of age and offers an after-school program for kids in grade school. Sunnyside cares for children from eight weeks to three years old and is located in the John T. Stewart Children’s Center in Haworth Hall. Educare, located in Dole, provides care for preschoolers. Contact these programs for further information and applications for admission (Hilltop: 864-4940; Sunnyside: 864-0720; Educare: 864-3498).

**Counseling and Psychological Services** – Counseling and Psychological Services (CAPS) provides personal counseling services to help students with issues related to adjusting to college and other psychological, interpersonal, and family issues. In addition to individual consultations, they also offer a support group called “Dissertation Distress”. A first visit is free with a nominal charge for subsequent visits. CAPS is located on the second floor of Watkins Memorial Health Center. Call 864-2277 to make an appointment or visit [caps.ku.edu](http://caps.ku.edu) for more information.

**Degree Progress Report (DPR)** – This form replaces the ARTs form. It is an online self-serve tool that allows you to track your progress toward completion of degree requirements. You will access the DPR through your myKU Portal using your KU Online ID and password. You will click the **Advising** tab, then **Progress**, then **Generate Report**.

**E-Mail Account** – A free e-mail account and web space (for classes and teaching) is provided to currently enrolled students. Visit KU Internet Technology (KUIT) at [technology.ku.edu/email](http://technology.ku.edu/email).

**Computer Help** – If you need help with IT or computer issues, including networking, printers, or software installation, please email Matthew Copeland at [matthew@ku.edu](mailto:matthew@ku.edu).

**Financial Aid** – Most graduate students receive GTAs or GRAs that, typically, provide a stipend for 9 to 12 months. All GTAs receive full tuition assistance. GRAs are allowed to pay an in-state tuition rate, regardless of residential status. Some GRAs will receive full tuition assistance as well, depending on the source of GRA funding. **Requests to have tuition payment deferred until you receive your first full paycheck can be made to the Bursar's Office located in 20 Carruth-O'Leary Hall.** GTAs are awarded on a competitive basis. Individual faculty members offer GRAs to students pursuing graduate research in their laboratory. University-wide fellowships are available from Graduate Studies. The Department nominates applicants for these fellowships. For further information about financial aid, students may contact the Office of Student Financial Aid, 50 Strong Hall, Lawrence, KS 66045-7535, email: [osfa@ku.edu](mailto:osfa@ku.edu), phone: (785) 864-4700.

**Health Insurance** – Health insurance is offered to students at institutions governed by the Kansas Board of Regents. You can access health insurance information and enrollment at [humanresources.ku.edu/graduate-student-health-insurance](http://humanresources.ku.edu/graduate-student-health-insurance).

**Health Services** – The student health services provided at Watkins Memorial Health Center (864- 9500) include general medicine, gynecology, sports medicine, physical therapy, health education, immunizations, allergy clinic, dietary counseling, counseling and psychological services, pharmacy, laboratory, and x-ray. Student health fees cover many services and many others are provided at a reduced rate. Visit their website at [studenthealth.ku.edu](http://studenthealth.ku.edu) for more information.

**Institutional Opportunity & Access** – IOA offers confidential assistance. This office will investigate, mediate, and help resolve complaints based on race, religion, color, sex, disability, national origin, ancestry, sexual orientation, marital or parental status, age, or veteran status. For more information, call 864-6414, e-mail [ioa@ku.edu](mailto:ioa@ku.edu), or visit their website at [ioa.ku.edu](http://ioa.ku.edu).

**International Student Services** – International students should consult the Office of International Student Services (ISS), located in Strong Hall, Room 2. They provide assistance with immigration and visa advice, orientation, and counseling. Contact the ISS Office at 864-3617 or visit their website at [iss.ku.edu](http://iss.ku.edu).

**KU Card** – All students are issued a KU Card, which serves as an official identification card and is valid as long as students remain enrolled. Once enrolled, students may obtain an ID card at the KU Card Center (Kansas Union, Level 4). You must present an enrollment schedule and photo ID. The KU card also serves as a debit card by depositing cash at one of the cash-to-card machines located on campus. For more information, call 864-5845 or visit their website at [kucard.ku.edu](http://kucard.ku.edu).

**Building Access** –After hours building access is granted by swiping your KU Card at Omni Lock doors. With faculty authorization, you may register your KU Card for building access with Ann Smith in 100A MRB.

**Legal Services for Students** – Legal Services is located in 312 Burge Union. They provide free legal services for currently enrolled KU students. Attorneys (or law students working under attorney supervision) interview and advise students. They provide three major services: advice, representation, and educational programs. Contact the office at 864-5665 or [legals@ku.edu](mailto:legals@ku.edu). For more information, visit their website at [legalservices.ku.edu](http://legalservices.ku.edu).

**Libraries** – KU Libraries are housed in several buildings on campus. You will likely use Anschutz Library the most. An overview of the library system can be found at [lib.ku.edu](http://lib.ku.edu).

**Multicultural Affairs** – The Office of Multicultural Affairs (OMA) offers programs and services for minority students at KU. Their primary objective is to enhance the educational experiences and opportunities for all students, though specifically for African American, Asian American, Hispanic American, and Native American students. The OMA is located in the Sabatini Multicultural Resource Center. For more information, contact them at 864-4350 or visit the website at [oma.ku.edu](http://oma.ku.edu).

**Ombuds** – The University Ombuds Office is a safe, anonymous, confidential, neutral place to express your concerns. The University Ombuds reviews each call without prejudice, and it is neither an advocate nor critic of any cause. The primary mission is to provide a confidential, neutral, and informal process that facilitates fair and equitable resolution to problems. For more information, call 864-7261 or visit [ombuds.ku.edu](http://ombuds.ku.edu).

**Parking & Transit** – Parking on campus requires a permit that can be purchased at the Parking Department (1501 Irving Hill Road). You must know your license tag at the time of purchase. Please note that a parking permit does not guarantee parking at any particular time (e.g., during KU basketball games). Find out more at [parking.ku.edu](http://parking.ku.edu). Those who live off campus may prefer to take the bus.

***Bus rides are free with a KUID card!***

**Public Safety Office** - The KU Public Safety Office is the crime investigation unit on campus. In addition, they conduct crime prevention and safety workshops. The most commonly reported crime on campus is theft. To aid in property retrieval in the event of a theft, the Public Safety Office allows students to check out engravers to mark personal property such as computers and stereos. For more information call 864-5900 (in an emergency, call 911) or visit their website at [publicsafety.ku.edu](http://publicsafety.ku.edu).

**Tuition & Fees** - Information on tuition is available at [registrar.ku.edu](http://registrar.ku.edu). In addition to tuition, campus fees are assessed depending on the number of credits of enrollment.

Late fees are assessed for enrollment on or after the first day of classes. Tuition is waived for Graduate Teaching Assistants (GTAs) who hold at least a 40% appointment and are enrolled in a minimum of 6 hours, and up to 3 hours of campus fees are paid. Graduate Research Assistants (GRAs) with at least a 40% appointment will be assessed resident rates with submission of a **Staff & Staff Dependent Rates** form (see Appendix) and campus fees are not waived.

*The Staff Rates Form must be completed for EVERY term that you are appointed as a GRA.*

**Writing Center** – The KU Writing Center offers free assistance to students at various stages of writing. This is a great resource for students working on a thesis or dissertation. Trained tutors are available by appointment (864-2399) in Anschutz Learning Studio, 4th Floor. For more information, visit [writing.ku.edu](http://writing.ku.edu).