



# NSF-IGERT COMPUTATIONAL MOLECULAR BIOLOGY TRAINING PROGRAM

## GRADUATE TRAINEE HANDBOOK

FALL 2006

IOWA STATE UNIVERSITY

**National Science Foundation (NSF)  
Integrative Graduate Education and Research Training (IGERT) Program**

***First, a bit about IGERT***

The Integrative Graduate Education and Research Traineeship (IGERT) program, which is funded by the National Science Foundation, seeks to train PhD scientists and engineers with the interdisciplinary background and the technical, professional and personal skills needed to address the global questions of the future. Through the use of innovative curricula and internships, and by focusing on problem-centered training, these programs give their graduates the edge needed to become leaders in their chosen fields.

*(The above is from the official NSF-IGERT website, <http://www.igert.org>, where you can learn much more about the program. Check it out!)*

***And then a (very brief!) bit of history about our project***

In 2005, Iowa State University (ISU) and New Mexico State University (NMSU) were awarded a five-year \$3 million National Science Foundation (NSF) Integrative Graduate Education and Research Training (IGERT) grant for computational molecular biology. The grant, which was secured by a team of ISU and NMSU faculty, builds on a previous \$2.6 million IGERT grant awarded to ISU in 1999 and supports continuing growth at ISU and NMSU in the burgeoning fields of bioinformatics and computational biology.

A major outcome of the initial funding period was the establishment of ISU's interdepartmental graduate program in Bioinformatics and Computational Biology (BCB), which currently enrolls sixty PhD students. The initial grant provided traineeships for thirty graduate students majoring in BCB, biophysics, chemical engineering, computer science, electrical engineering and genetics, as well as significant funding for computational biology hardware, software, and support personnel.

The principal goals for the new NSF IGERT grant are to lead the field of computational biology into the next era of discovery and to educate a diverse group of professionals to spearhead this effort. These goals will be achieved through a partnership between ISU and a similar emerging effort at NMSU, the Center for Research Excellence in Bioinformatics and Computational Biology (BCB).

The ISU-NMSU partnership is synergistic. Faculty share common research interests, which encompass genome informatics, macromolecular dynamics and interactions, and metabolomics and regulatory networks. Research collaborations are already in place between ISU and NMSU, including a commitment to partner in bioinformatics graduate training.

More than ninety ISU and NMSU faculty members engage in bioinformatics, computational biology and biological statistics research. The institutions' extraordinary success in fostering highly collaborative research environment is manifested in a large

number of interdisciplinary and interinstitutional research projects in bioinformatics and computational biology.

In addition to the primary ISU-NMSU partnership, this project also partners the schools with Pioneer Hi-Bred, International, which has contributed \$100K annually since 1999, including graduate traineeships and internships, as well as with Sandia National Laboratories and the National Center for Genome Resources (NCGR), which also will provide internship opportunities for ISU and NMSU students. Students also can take advantage of international research opportunities at Bielefeld University in Germany.

Through the IGERT grant, we are able to provide not only direct financial support for trainees, but also support for some of the things that benefit the broader computational molecular biology community and help make quality research possible – such as equipping computer labs, making sophisticated software available, and bringing world-renowned scientists to campus.

### ***Why you have been selected as an IGERT trainee, and what's expected of you***

Many factors are considered in selecting IGERT trainees. The purpose of our IGERT project is to train top-notch scientists in the interdisciplinary field of computational molecular biology, so we of course seek out students who have a solid and suitable academic background complemented with good research experience, who have demonstrated they have what it takes to succeed.

Trainees are expected to conduct interdisciplinary research involving both molecular biology and a quantitative science, which may be computational, mathematical or statistical.

Trainees are expected to work just a little harder, probe just a little more deeply, reach just a little farther, think just a little more creatively and collaborate just a little more globally.

Trainees are expected to become leaders in the field of computational molecular biology.

### ***What your IGERT traineeship provides***

The NSF IGERT traineeship in Computational Molecular Biology is a competitive award that provides two years of financial support to qualifying PhD students. During this two-year period, the IGERT traineeship pays the research stipend, tuition, fees and health insurance. In addition, IGERT provides each trainee a discretionary Cost of Education (COE) fund to use for educational purposes. This fund can be used, for example, for computer hardware and software, textbooks, scientific journals or short training courses. The traineeship also provides travel funds to support participation in professional conferences.

Continued IGERT support is contingent upon remaining in good academic standing and making satisfactory progress toward the degree. If a trainee transfers from a PhD program to an MS program, the IGERT traineeship benefits will be forfeited.

At the end of the two-year IGERT funding period, the trainee's major professor or home department assumes responsibility for funding the student. Regardless the funding source, students are considered to be IGERT trainees throughout the course of their study at Iowa State. Trainees may continue to use any funds that remain in their COE and travel accounts at the end of the initial two years.

**Trainees should note that, in most cases, research assistantships provided by major professors or departments after the conclusion of the IGERT traineeships will not match the level of funding provided by IGERT. It is important, therefore, that trainees plan ahead and use wisely the generous financial support that is provided during the two years of the IGERT traineeship.**

### *Administrative support*

The IGERT program is overseen by the director and program assistant, who serve as resources for IGERT trainees throughout graduate study. Trainees are encouraged to contact the director or program assistant for further information about traineeship funding, requirements and opportunities.

Overseeing the IGERT project at ISU:

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Ames, IA 50011  
515-294-7937  
Toll-free: 877-578-8844  
igert@iastate.edu

Overseeing the IGERT project at NMSU:

Desh Ranjan, Director  
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New Mexico State University  
Las Cruces, NM 88001  
505-646-4600  
dranjan@cs.nmsu.edu

Linda Sandoval, Program Assistant  
Box 30001, MSC CS  
New Mexico State University  
Las Cruces, NM 88001  
505-646-4451  
lsandova@cs.nmsu.edu

### ***IGERT on the web***

Our IGERT project website is <http://igert.iastate.edu>.

## **GETTING STARTED**

### ***Orientation and registration***

In many of the graduate programs at Iowa State University, the new students' academic year begins with a Graduate Student Orientation held during the week prior to the start of Fall semester classes. Sometime during this week, new IGERT trainees will have an opportunity to meet with the IGERT director and current IGERT trainees. The director will serve as trainees' IGERT advisor throughout the course of their graduate work at Iowa State. Prior to registering for Fall courses, IGERT trainees will meet with the IGERT director to become familiar with the IGERT course requirements and for assistance in schedule planning.

## **IGERT COURSE AND TRAINING REQUIREMENTS**

IGERT requirements, in some cases, overlap major program requirements. In other cases, IGERT requirements are in addition to major program requirements.

### ***Laboratory exploration rotations***

A key aspect of the IGERT program is participation in research exploration rotations. The rotations serve several purposes. They are designed to help students choose their future major professors and to help professors choose graduate students. In addition, exploration rotations provide students an opportunity to actively participate in research projects and promote interaction and exchange of information among research groups. Because rotations are necessarily brief, students are not usually able to "complete" a project, in either a biological or computational research group. Instead, during the research exploration rotation period, students should use this time to:

- get to know the professor, students and postdoctoral research trainees working in the research group;
- learn as much as possible about the professor's research projects;
- obtain "hands on" experience in one of the group's research projects;
- attend research group meetings and journal club meetings; and
- read reprints, reviews, and grant proposals related to the group's research.

It is appropriate for a rotating student to ask the rotation advisor whether the advisor would consider accepting him/her as a graduate student, but the final decision should not be made until all rotations have been completed.

Participation in three research exploration rotations is required for all first year IGERT trainees. At least one rotation must be a "wet" laboratory experience (usually in a biological science laboratory using molecular biological, biophysical or biochemical techniques). At least one rotation must involve a strong computational component (usually in a research group in computer science, mathematics, physics, statistics or engineering). Students are strongly encouraged to participate in rotations in at least two different departments, and *rotations must include laboratories in more than one collaborative research group.*

Beginning in Orientation Week and during the BCB Fall Faculty Seminar Series (BCB 691), students will have an opportunity to meet individual faculty members and discuss their research. Students should arrange individual appointments to discuss rotation possibilities with the professors whose work interests them.

Students should make use of the following resources in selecting research groups and professors with whom to rotate:

- the list of faculty who have expressed an interest in serving as mentors for research exploration rotation students, available on the BCB website at [http://www.bcb.iastate.edu/courses/current\\_rotations\\_06.htm](http://www.bcb.iastate.edu/courses/current_rotations_06.htm);
- homepages of individual Baker Center faculty at <http://www.bioinformatics.iastate.edu/faculty/contact.html>;
- discussions with individual faculty members (faculty can provide curriculum vitae, recent publications and grant proposals);
- research talks given by faculty in the BCB Fall Faculty Seminar series and in the various departmental seminars on campus;
- discussions with current IGERT trainees.

Students should compile a list of several faculty members with whom they would like to rotate; this can be done in consultation with the IGERT director. Students should personally contact the faculty members to determine whether they are accepting rotation students and to schedule a rotation.

To assist both faculty and students in planning, students should attempt to schedule exploration rotations as early as possible. The length of each rotation typically is eight weeks. **Adherence to the following timetable is strongly recommended. Students should notify the IGERT office of their choices on or before the deadlines indicated.**

LAB EXPLORATION ROTATION TIMETABLE	
Deadlines for beginning rotations:	
Rotation #1	September 5
Rotation #2	October 30
Rotation #3	January 22
Deadline for final lab decision	April 2
Deadline for filing Home Department form	April 16

If a student realizes within the first two weeks of a rotation exploration that the rotation experience is not in an area of research he or she wishes to pursue, the student should consult with the IGERT director, who will help in arranging another exploration rotation if assistance is needed.

### ***Choosing a major professor and establishing a home department***

Much of the first year will be devoted to the important process of selecting a major professor. After completing research exploration rotations, students should contact their potential major professors to discuss the possibility of joining their laboratories. For administrative purposes, the major professor's department becomes the student's home department. After choosing a major professor, students enrolled in interdisciplinary graduate programs must initiate a *Request to Establish a Home Department for Students Admitted to Interdepartmental Majors* form (Appendix E).

Some important notes about selecting a major professor:

- ***Students should not feel pressured to make a final decision about their future major professor until all exploration rotations have been completed.*** It is in the student's best interest to reserve a final lab decision until becoming fully informed about all available opportunities. Faculty are ***strongly*** encouraged to wait until new IGERT trainees have had an opportunity to complete all rotations before making a commitment to any specific student.
- ***It is CRITICAL that students discuss their future research assistantship support with potential major professors.*** During the exploration rotation period and throughout the first two years, IGERT trainees are supported as Research Assistants (RAs) with funds provided by the NSF IGERT traineeships. After the end of the IGERT-funded years, responsibility for the student's assistantship funding lies with the major professor and home department.

When a faculty member agrees to serve as a trainee's major professor, s/he is expected to arrange assistantship support for the remainder of the student's degree program, as long as the student remains in good standing and is making good progress toward the degree. Because much research funding is grant related, very few professors are able to "guarantee" a specific source of graduate assistantship support for several years. It is important, therefore, that each student take an active

role in discussing future assistantship funding with the major professor. Most students receive support as either a Research Assistant (RA) or a Teaching Assistant (TA), with funding supplied by the major professor and/or the home department. In some cases, students receive support from other sources, such as scholarships, training grants, or competitive research assistantships.

As noted previously under *What Your IGERT Traineeship Provides*, trainees should be aware that, in most cases, research assistantships provided by major professors or departments after the conclusion of the IGERT traineeships will not match the funding level of the initial two years of IGERT support.

### ***Choosing a co-major professor***

IGERT requires that the major and co-major professor – **one from the biological sciences and one from the computational/quantitative sciences** – actively serve as joint mentors for the trainee.

The co-major professor plays an integral role in the mentoring of IGERT trainees. Oftentimes, major and co-major professors have active research collaborations, and IGERT PhD projects emerge from these joint research efforts. If this is not the case, it still is expected that the co-major professor will meet regularly with the IGERT trainee to provide input and help guide the dissertation research. The selection of a co-major professor, therefore, is an important decision and should be given careful consideration. The major professor will assist the student in choosing an appropriate co-major professor

The co-major professor must be chosen prior to filing the *Recommendation for Committee Appointment* form (Appendix F). Co-major professors typically do not provide assistantship funding.

### ***Appointing a Program of Study (POS) Committee***

After choosing the major and co-major professors and establishing a home department, students should begin planning a suitable program for completion of their graduate coursework. Before the end of the first year, students should appoint a graduate Program of Study (POS) Committee by filing a *Recommendation for Committee Appointment*.

The POS committee should include faculty members whose knowledge and research interests will aid and complement the student's research interests, as well as faculty whose expertise will ensure a breadth of knowledge on the committee. The POS PhD committee must include at least five members of the Graduate College Faculty. The composition and responsibilities of the POS committee are in accordance with the Graduate College guidelines and the trainee's home department.

## **Coursework**

### Required Core Courses

At least one core course in Molecular Biology:

Gen 411, 3 cr, **OR**

GDCB 511, 3 cr

And at least one core course in Computational Biology:

BCB 548 (will become 567) Fundamentals of Genome Informatics, 3 cr, **OR**

BCB 594 (will become 568) Advanced Genome Informatics, 3 cr, **OR**

BCB 569 Structural Genome Informatics, 3 cr, **OR**

BCB 570 Computational Functional Genomics and Systems Biology, 3 cr

### Advanced Courses

At least six credits, consisting of three in molecular/cellular biology and three in computer science/mathematics/statistics (*Advanced Courses*, Appendix C).

### Required Seminars and Activities

BCB 593 Workshop (at least 2 required)

BCB 691 Faculty Seminar (Fall) (at least 1 required)

BCB 690 Student Seminar (Spring) (at least 2 required; 2 oral presentations required)

Scientific Ethics Day (during Fall Orientation)

Bioethics Training: *IGERT trainees are required to take at least two bioethics modules or another IGERT-approved bioethics course (1 credit minimum). The required sessions in general scientific ethics offered during Fall orientation (above) do not count toward this bioethics course requirement.*

Agron/Gen/PIP 565A Professional Practices in Research, .5 cr, S

Agron/Gen/PIP 565B Intellectual Property and Industry Interactions, .5 cr, S

Agron/Gen/PIP 565C Life Science Ethics, .5 cr, S

Annual Joint Bioinformatics Symposia: *Iowa State University, New Mexico State University and The University of Iowa conduct an Annual Joint Bioinformatics Symposium in which IGERT trainees are required to participate throughout the course of their graduate work. The primary objectives of the symposia are to:*

- *strengthen the core of bioinformatics research at the participating universities;*
- *encourage interaction and collaboration with and among computational biologists at the institutions;*
- *strengthen the IGERT partnership between Iowa State and New Mexico State University*

*In addition, the symposia provide opportunities for students to hone their poster and oral presentation skills.*

## **GPA requirements**

If a student's cumulative grade point average (GPA) for all coursework taken falls below 3.0, the student is placed on academic probation by the Graduate College. (Exception: "First term graduate students who fall below a 3.0 GPA at the end of their first semester will be given a one term grace period to bring their grades back to a 3.0 GPA.") According

to the Graduate College policy, “If a student is to qualify for a tuition scholarship, he/she must be removed from probation by the tenth class day of the term.”

If an IGERT trainee fails to maintain a cumulative GPA of 3.0 for all coursework taken, the trainee will be allowed a one semester grace period in which to raise his/her cumulative GPA to 3.0. During this grace period, IGERT will continue to provide the research stipend but will not cover tuition, and the trainee’s use of IGERT Cost of Education funds and travel funds will be suspended. If, at the end of the semester the trainee has raised his/her cumulative GPA to 3.0 or above, the student’s IGERT traineeship will be fully reinstated. If, however, the trainee has failed to achieve a cumulative GPA of 3.0 for all courses taken, the IGERT traineeship will be completely and fully terminated and will not be reinstated.

### ***Preliminary examination***

The Graduate College requires that all Ph.D. students pass a Preliminary Examination before advancing to candidacy for the doctoral degree. To initiate this process, the student must file a *Request for Preliminary Examination* form (Appendix I, available from department and program administrative offices and the Graduate College). **The Preliminary Examination meeting should be held before the end of the first semester of the third year.**

### ***IGERT annual interview and the IGERT Requirements Checklist***

IGERT trainees meet individually with the IGERT director at least once each year throughout graduate training. The annual IGERT interview provides an opportunity to note the past year’s achievements as well as any difficulties the trainee may be encountering, and to ensure that the student’s degree program is on track. It also enables the program to help students address problems before the problems become major.

The *IGERT Requirements Checklist* (Appendix J) is one of the most important tools for tracking progress in meeting IGERT requirements. Trainees complete the form and bring it to each year’s interview with the IGERT director. It is recommended that trainees retain an electronic copy of the completed form so that it can easily be updated each year.

### ***Thesis seminars***

Most graduate programs require that PhD students present a thesis seminar that is open to the university community. Trainees are encouraged to attend these seminars to expand their scientific background and support their colleagues.

At least two weeks prior to the thesis seminar, trainees should contact the IGERT office, providing the following information:

- seminar title
- seminar abstract
- seminar date, time and location

### *Graduating and moving on*

Before leaving campus to pursue the Nobel laureateship, trainees should contact the IGERT director to schedule a brief exit interview to discuss plans for the future and provide program input.

**Graduating trainees must provide a hardbound copy of the final thesis to the IGERT office.** The IGERT copy does not require special paper, and can be printed on either one or both sides of the page. Thesis binding services are provided for a nominal charge by the Memorial Union Copy Center.

Students also will be asked to complete a brief *Alumni Information Form* to help the IGERT program remain in contact and track trainees' careers.

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\* Form is available on the Graduate College forms page at <http://www.grad-college.iastate.edu/forms/forms.html>

## Appendix A

### IGERT Trainees Fall 2006

<i>Last Name</i>	<i>First Name</i>	<i>Major</i>	<i>Dept</i>	<i>Major Professor/s</i>	<i>Campus Address</i>	<i>Office or Cell Ph</i>	<i>Email @ iastate.edu</i>
Andorf	Carson	Com S	Com S	Honavar/Dobbs	215 Atanasoff	294-4377	andorfc
Borsuk	Lisa	BCB	GDCB	Schnable/Chou	2031 Carver Co-Lab	294-1659	lborsuk
Brathwaite	Mgavi	BCB	Com S	Honavar/Greenlee	226 Atanasoff	294-4377	mebxi
Donnelly	Jennifer	Agron	Agron	Dekker/Ashlock	3010 Agron	451-6469	poppet
Doty	David	BCB, ComS	Math	Ashlock/Mayfield	226 Atanasoff	294-5445	ddoty
Dunn-Thomas	Tyra	BCB	Biomed Sci	Greenlee/Honavar	1046 Vet Med	294-5832	tdunn
Emrich	Scott	BCB	ECpE	Aluru/Schnable	3101 Coover	294-2667	semrich
<b>Farnham</b>	<b>Robert</b>	<b>BCB</b>					<b>farnham</b>
Hill	Anthony	Chem E	Chem E	Reilly/Wu	3053 Sweeney	294-7642	tonyhill
Hoy	Julie	Biophys	BBMB	Hargrove/Dobbs	4132 MBB	294-0520	hoyj
Hughes	LaRon	BCB	An Sci	Reecy/Honavar			laron
Kronmiller	Brent	BCB	Plnt Path	Wise/Gu	409 Bessey	294-2893	bak
<b>Larson</b>	<b>Nicholas</b>	<b>Stat</b>	<b>Stat</b>				
<b>Ocasio</b>	<b>Roberto</b>	<b>Plant Path</b>	<b>Plant Path</b>	<b>Harrington</b>			<b>rocasio</b>
Orley	Sarah	Elec Engg	ECpE	Aluru/Huang	3101 Coover	294-3811	sarita
Schlueter	Shannon	BCB	GDCB	Brendel/Shoemaker	2214 MBB	294-2360	sds
<b>Strandjord</b>	<b>Dana</b>	<b>Genet</b>					
<b>Towfic</b>	<b>Fadi</b>	<b>BCB</b>					
Vander Velden	Kent	BCB	GDCB	Reilly/Honavar			kent
Vedell	Pete	BCB, Math	Math	Wu/Jernigan	368 Carver	294-1752	vedell

Key:  
 BBMB – Biochemistry, Biophysics and Molec Biology Department  
 BCB – Bioinformatics and Computational Biology program  
 ECpE – Electrical and Computer Engineering Department  
 GDCB – Genetics, Development and Cell Biology Department  
 MBB – Molec Biology Building

## APPENDIX B

### BAKER CENTER FACULTY Fall 2006

<i>Last Name</i>	<i>First Name</i>	<i>Department</i>	<i>Office Address</i>	<i>Office Phone</i>	<i>Email</i>
Ackerman	Ralph	Ecology, Evolution & Organismal Biology	601 Science II	294-8676	racker
Adams	Dean	Ecology, Evolution & Organismal Biology; Statistics	253 Bessey	294-3834	dcadams
Aluru	Srinivas	Electrical and Computer Engineering	3218 Coover	294-3539	aluru
Andreotti	Amy	Biochemistry, Biophysics & Molec Biol	4208 Molec Biology	294-4953	amyand
Ashlock	Dan	Mathematics	438 Carver	294-7965	danwell
Bartlett	Eric	Electrical and Computer Engineering	306 Town Engineering	294-1828	ebart
Baum	Thomas	Agriculture and Biosystems Engineering	351 Bessey	294-23985	tbaum
Bogdanove	Adam J.	Plant Pathology	423 Bessey	294-3421	ajbog
Brendel	Volker	Genetics, Development & Cell Biology	2112 Molec Biology	294-9884	vbrendel
Bronikowski	Anne	Ecology, Evolution & Organismal Biology; Statistics	253 Bessey	294-7170	abroniko
Brumm	Thomas	Agriculture and Biosystems Engineering	107 Davidson	294-5145	tbrumm
Carriquiry	Alicia	Statistics	102 Snedecor	294-3440	alicia
Chou	Hui-Hsien	Genetics, Development & Cell Biology	503 Science II	294-9242	hhchou
Cook	Dianne	Statistics	325 Snedecor	294-8865	dicook
Davidson	Jennifer	Electrical and Computer Engineering	438 Carver	294-2941	davidson
Dekker	Jack	Agronomy	3214 Agronomy	294-8299	jdekker
Dekkers	Jack	Animal Science	239D Kildee	294-7509	jdekkers
Dickerson	Julie	Electrical and Computer Engineering	3123 Coover	294-7705	julied
Dixon	Philip	Statistics	120 Snedecor	294-2142	pdixon
Dobbs	Drena	Genetics, Development & Cell Biology	2114 Molec Biology	294-1112	ddobbs
Dorman	Karin	Statistics; Genetics, Development & Cell Biology	210C Snedecor	294-8392	kdorman
Eulenstein	Oliver	Computer Science	212 Atanasoff	294-2407	oeulnst@cs.iastate.edu
Fernandez-Baca	David	Computer Science	209 Atanasoff	294-2168	fernande
Fernando	Rohan	Animal Science	225D Kildee	294-5348	rohan
Greenlee	M. Heather West	Department of Biomedical Sciences and Interdepartmental Neuroscience Program	2070 Veterinary Medicine	294-9251	mheather
Gu	Xun	Genetics, Development & Cell Biology	536 Science II	294-8075	xgu
Ho	Kai-Ming	Astronomy & Physics; Ames Laboratory	A502 Physics	294-1960	kmh@ameslab.gov
Honzatko	Richard	Biochemistry, Biophysics & Molec Biology	4206 Molec Biology	294-7103	honzatko
Honavar	Vasant	Computer Science	211 Atanasoff	294-1098	honavar@cs.iastate.edu
Hong	Mei	Chemistry	1605 Gilman	294-3521	mhong
Huang	Xiaoqiu	Computer Science	226 Atanasoff	294-4377	xqhuang@cs.iastate.edu
Janzen	Fred	Ecology, Evolution & Organismal Biology	343 Bessey	294-4230	fjanzen
Jernigan	Robert	Plant Sciences Institute	112 Office and Lab	294-3833	jernigan
Jones	Douglas E.	Veterinary Pathology	2764 Vet Med	294-4682	jonesdou
Koehler	Kenneth	Statistics	120 Snedecor	294-4181	kkoehler
Kothari	Suraj	Electrical and Computer Engineering	3214 Coover	294-7212	kothari
Lamont	Susan	Animal Science	2255 Kildee	294-4100	sjlamont
Lavrov	Dennis	Ecology, Evolution & Organismal Biology	353 Bessey	294-9091	dlavrov

<i>Last Name</i>	<i>First Name</i>	<i>Department</i>	<i>Office Address</i>	<i>Office Phone</i>	<i>Email</i>
Lawrence	Carolyn	Agronomy	1565 Agronomy	294-7380	triffid
Levine	Howard A.	Mathematics	410 Carver	294-8145	halevine
Macintosh	Gustavo	Biochemistry, Biophysics and Molec Biology	2214 Molec Biology	294-2627	gustavo
Maddux	Roger	Mathematics	418 Carver	294-8134	maddux
Mallapragada	Surya	Chemical Engineering	3035 Sweeney	294-7407	suryakm
Mayfield	John	Genetics, Development & Cell Biology	2106 Molec Biology	294-6847	jemayf
Miller	Leslie	Computer Science	227 Atanasoff	294-4377	lmiller@cs.iastate.edu
Miller	W. Allen	Plant Pathology	413 Bessey	294-2436	wamiller
Minion	Chris	Veterinary Microbiology and Preventive Medicine	1130 Vet Med	294-6347	fcminion
Moloney	Kirk A.	Ecology, Evolution & Organismal Biology	253 Bessey	294-6415	kmoloney
Nettleton	Dan	Statistics	111A Snedecor	294-7754	dnett
Nikolau	Basil	Biochemistry, Biophysics & Molec Biol	2210 Molec Biology	294-9423	dimmas
Nilsen-Hamilton	Marit	Biochemistry, Biophysics & Molec Biol	3206 Molec Biology	294-9996	mnh@molebio.iastate.edu
Nolan	Lisa K.	Veterinary Microbiology and Preventive Medicine	2180 Vet Med	294-5776	lknolan
Peccoud	Jean	Genetics, Development & Cell Biology			jean.peccoud@pioneer.com
Peters	Reuben J.	Biochemistry, Biophysics & Molec Biol	4108 Molec Biology	294-8580	rjpeters
Peterson	Thomas	Genetics, Development & Cell Biology	2208 Molec Biology	294-6345	thomasp
Phillips	Gregory J.	Veterinary Microbiology & Preventive Med	202 VMRI Bldg 6	294-1525	gregory
Proulx	Stephen	Ecology, Evolution & Organismal Biology	339 Bessey	294-0272	proulx
Rajan	Krishna	Materials Science and Engineering	2220 Hoover	294-2670	krajan
Reecy	James	Animal Science	2255 Kildee	294-9629	jreecy
Reilly	Pete	Chemical Engineering	2031 Sweeney	294-5968	reilly
Rodermel	Steven	Botany	457 Bessey	294-8890	rodermel
Rothschild	Max	Animal Science	2255 Kildee	294-6202	mfrothsc
Sakaguchi	Donald	Genetics, Development & Cell Biology	503 Science II	294-3112	dssakagu
Schnable	Patrick	Agronomy	2035B Carver Co-Lab	294-0975	schnable
Shoemaker	Randy	Agronomy	G401 Agronomy	294-6233	rcsshoe
Smiley	Michael	Mathematics	458 Carver	294-6420	mwsmiley
Smith	Jonathan	Mathematics	496 Carver	294-8172	jdsmith
Song	Guang	Computer Science		294-7287	gsong
Song	Xueyu	Chemistry	303 Wilhelm	294-4383	xsong
Travesset	Alex	Physics and Astronomy	A503 Physics	294-7191	trvsst@ameslab.gov
Tuggle	Chris	Animal Science	2255 Kildee	294-4252	cktuggle
Valenzuela	Nicole	Ecology, Evolution & Organismal Biology	239 Bessey	294-1285	nvalenzu
Voytas	Daniel	Genetics, Development & Cell Biology	1035A Carver Co-Lab	294-1963	voytas
Wallace	Robert	Ecology, Evolution & Organismal Biology	353 Bessey	294-0367	rwallace
Wendel	Jonathan	Ecology, Evolution & Organismal Biology	353 Bessey	294-7172	jfw
Whitham	Steve	Plant Pathology	351 Bessey	294-4952	swhitham
Willson	Stephen	Mathematics	411 Carver	294-7671	swillson
Wise	Roger	Plant Pathology	409 Bessey	294-9756	rpwise
Wu	Zhijun	Mathematics	370 Carver	294-8165	zhijun
Wurtele	Eve	Genetics, Development & Cell Biology	441 Bessey	294-8989	mash
Yu	Edward	Physics & Astronomy	A115 Physics	294-5440	ewyu@ameslab.gov

## APPENDIX C

### PARTIAL LIST OF COURSES MEETING ADVANCED COURSE REQUIREMENT

#### **Group I. Advanced Courses in Molecular/Cellular Biology** (at least 3 credits required)

An Sci 556 Current Topics in Genome Analysis, 3 cr, Alt S  
BCB 550 Evolutionary Problems for Computational Biologists, 3 cr, F  
BCB 538 Computational Genetics & Evolution, 3 cr, Alt S  
BCB 539 Statistical Methods for Computational Biology, 3 cr, Alt S  
BBMB 404 Biochemistry, 3 cr, F  
BBMB 405 Biochemistry, 3 cr, S  
BBMB 451 Physical Biochemistry, 2 cr, F  
BBMB 501 Comprehensive Biochemistry I, 4 cr, F  
BBMB 502 Comprehensive Biochemistry II, 4 cr, S  
BBMB 531 Structure and Reactivity of Biomolecules, 1 cr, F  
BBMB 541 Computational Biochemistry, 1 cr, F  
BBMB 542 A, B, C, D, E, 1 cr per module, F, S, SS  
BBMB 551 Molecular Biophysics, 3 cr, F  
BBMB 653 Protein Chemistry–Physical Methods, 1 cr, Alt S  
Gen462/EEOB 562 Evolutionary Genetics, 3 cr, S  
GDCB 520 Genetic Engineering, 3 cr, Alt F  
EEOB 563 Molecular Phylogenetics, 3 cr, F  
EEOB 566 Molecular Evolution, 3 cr, F

#### **Group II. Advanced Courses in Comp Sci/Math/Stat** (at least 3 credits required)

BCB 548\* (will become 567) Fundamental of Genome Informatics, 3 cr, F  
BCB/Cpr E/Com S 549 Advanced Algorithms in Computational Biology, 3 cr, S  
BCB 550 Evolutionary Problems for Computational Biologists, 3 cr, F  
BCB 551 Computational Techniques for Genome Assembly and Analysis, 3 cr, F  
BCB 594\* (will become 568) Advanced Genome Informatics, 3 cr, S  
BCB 596 Genomic Data Processing, 3 cr, F  
BCB 597 Introductory Computational Structural Biology, 3 cr, F  
Com S 311 Design and Analysis of Algorithms, 3 cr, F S  
Com S 363 Introduction to Database Management Systems, 3 cr, F S  
Com S 461 Database Systems Concepts and Internals, 3 cr, F  
Com S 472/572 Principles of Artificial Intelligence, 3 cr, F  
Com S 474 Elements of Neural Computation, 3 cr, S  
Com S 511 Design and Analysis of Algorithms, 3 cr, F  
Com S/Cpr E 526 Introduction to Parallel Algorithms and Programming, 4 cr, F  
Com S 561 Principles of Database Systems, 3 cr, S  
Com S 573 Machine Learning, 3 cr, Alt S  
Com S 574 Intelligent Multiagent Systems, 3 cr, S  
Com S 611 Advanced Topics in Analysis of Algorithms, 3 cr, Alt S  
Com S 672 Advanced Topics in Computational Models of Learning, 3 cr, Alt S  
Com S 673 Advanced Topics in Computational Intelligence, 3 cr, Alt S  
EE 547 Pattern Recognition, 3 cr, F  
BCB 594\* Computational Molec Biology, 3 cr, S  
Math 304 Introductory Combinatorics, 3 cr, F  
Math 307 Matrices and Linear Algebra, 3 cr, F, S, SS  
Math 314 Graphs and Networks, 3 cr, S  
Math 378 Optimization & Modeling with Evolutionary Computation, 3 cr, S  
Stat 500 Statistical Methods, 4 cr, F  
Stat 536 Statistics for Population Genetics, 3 cr, Alt F  
Stat 537 Statistics for Molecular Genetics, 3 cr, Alt F  
Stat 542 Theory of Probability and Statistics I, 3 cr, F  
Stat 543 Theory of Probability and Statistics II, 4 cr, S

\* Course may not be used to meet BOTH core course and advanced group requirements.

## APPENDIX D

### IGERT REQUIREMENTS AND TIMETABLE

#### IGERT REQUIREMENTS

Requirement	Course Number (Semester Offered)	Course Name	Ph.D.
Research rotation (first year only)	697 or 699	Research Rotations - at least one wet (biological) lab and at least one dry (computational) lab in at least two different research collaborations	3 labs
Bioethics training	(F) <b>AND</b> Var. (usually S)	Fall Scientific Ethics Workshop <b>AND</b> Approved bioethics course/modules	1 session and 1 cr
Core courses	Gen 411 or GDCB 511 (S) <b>AND</b> BCB 548/567 (F) <b>or</b> BCB 594/568 (S) <b>or</b> BCB 569 BCB 570	Molecular Genetics <b>AND</b> Fundamentals of Genome Informatics Advanced Genome Informatics Structural Genome Informatics Computational Functional Genomics & Systems Biology	3 cr  3 cr 3 cr 3 cr 3 cr
Advanced group coursework	Variable	Group I (Molecular and Cellular Biology) <b>AND</b> Group II (Com S, Math, Stat)	3 cr 3 cr
Workshops and symposia	BCB 593*	BCB Workshop	2 times
Student research seminars	BCB 690 (S)	BCB Student Research Seminar (2 oral presentations are required)	2 times
Faculty seminars	BCB 691 (F)	BCB Faculty Research Seminar	1 time

\* BCB 593 Workshop is offered various semesters, but at least once each year.

#### IGERT TIMETABLE AND DEADLINES

Attend Lab Safety Training	Orientation week
Attend Scientific Ethics Workshop	Date TBA
Start rotation 1	September 5
Start rotation 2	October 30
Start rotation 3	January 22
Make major professor decision	April 2
File <i>Home Department</i> form	April 16
File <i>Committee Appointment</i> form NOTE: must appoint two co-major professors, one from the biological sciences and one from the computational/quantitative sciences	Before end of 1 <sup>st</sup> year
Hold first POS Committee meeting and file <i>Program of Study (POS)</i> form	By 1 <sup>st</sup> semester of 2 <sup>nd</sup> year
Hold annual POS meeting	Each subsequent October
Take preliminary examination	By 1 <sup>st</sup> semester of 3 <sup>rd</sup> year
Submit thesis to POS committee	2 weeks prior to defense
Provide PhD research seminar information, title and abstract to IGERT office	2 weeks prior to seminar

**Request to Establish a Home Department for Students Admitted to Interdepartmental Majors**

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The graduate student should initiate this request by completing Section 1 of this form and giving it to his/her interdepartmental chair. **The Interdepartmental Chair (DOGE) should complete Section 2 and send this form, together with other documents he/she may wish to transmit, by sealed envelope, to the proposed cooperating department.** When completed, this form should be sent to the Graduate College, 1137 Pearson Hall, for approval and retention. Copies will be returned to the interdepartmental chair and to the department.

**I. Student Information**

(Please Type or Print)

I, \_\_\_\_\_, request admission to the \_\_\_\_\_ Department, effective \_\_\_\_\_ (term and year).

My major is  BCB  FCS  Genetics  Human Computer Interaction  
 Immunobiology  MCDB  Microbiology  Plant Physiology  
 Neuroscience  Sustainable Agriculture  Systems Engineering  Toxicology.

Degree Sought \_\_\_\_\_ Date of Request \_\_\_\_\_

Student's Signature \_\_\_\_\_ SS# \_\_\_\_\_

Current Mailing Address \_\_\_\_\_ Phone \_\_\_\_\_

Campus Address \_\_\_\_\_ Email Address \_\_\_\_\_

**II. Interdepartmental Chair Information**

The student is enrolled in the \_\_\_\_\_ interdepartmental major, on a

Full  Provisional  Restricted basis and is pursuing a \_\_\_\_\_  Ph.D.  M.S. degree in this interdepartmental major. \_\_\_\_\_ Major Professor

(Please Print)

Comments \_\_\_\_\_  
 \_\_\_\_\_

Signed \_\_\_\_\_ Date \_\_\_\_\_  
 (DOGE of Interdepartmental Major)

**III. Proposed Cooperating Department Information**

Request Denied. I do not agree to accept this student in the \_\_\_\_\_ Department.

Request Approved. I agree to accept this student in the \_\_\_\_\_ Department.

Full  Provisional  Restricted basis, having examined his/her undergraduate transcript, graduate record at Iowa State University and the above comments.

Signed \_\_\_\_\_ Date \_\_\_\_\_  
 (Head/Chair of Department)

**IV. Response**

Graduate College Response \_\_\_\_\_

Date \_\_\_\_\_

Copy:  Student  Interdepartmental Major  Department  Records

**Important**  
 This recommendation form must be typewritten and submitted to the Graduate College Office for approval, **and must be submitted and approved before the Program of Study will be processed.**  
 Approved copies will be returned to the department(s) (as listed in item #5 and #6 below) to distribute to the DOGE, major professor, and the student.

1. Student's Name: \_\_\_\_\_  
Last First Middle

2. SS#: \_\_\_\_\_ 3. E-mail: \_\_\_\_\_

I. Student Degree Information	
4. Degree Sought: <i>(Indicate 2<sup>nd</sup> degree only if in a double-degree program)</i>	
5. Department	6. Co-Department (if any)
7. Major	8. Co-Major (if any)
9. Area of Specialization (if any)	10. Co-Area of Specialization (if any)
11. Minor Department(s) (if any)	12. Minor(s) (if any)

II. Committee Member Information					
Code No.*		Name (Typed and Signed)	Major or Program <i>(Abbreviation)</i>	Department <i>(Abbreviation)</i>	Office Use Only

\*Codes: 1 = Major Professor/Co-Major Professor  
 2 = Minor Representative  
 3 = Committee Member  
 4 = **Non-member of the Graduate Faculty (MEMO REQUIRED)**

Committee appointment form will be **returned** without a memo.

Comments:

III. Signatures		
(OFFICE USE ONLY)	Student	Date
	Director of Graduate Education (DOGE) for Major	Date
	DOGE for Co-Major (if any)	Date
	DOGE for Interdept. Major or Minor (if any)	Date
Month and Year		

Copy \_\_\_\_\_ Department \_\_\_\_\_ Major \_\_\_\_\_ Major Professor \_\_\_\_\_ Student \_\_\_\_\_ Co-major \_\_\_\_\_ Minor \_\_\_\_\_

**Master's POS Committee** The master's POS committee consists of at least three members of the graduate faculty. It must include two members, including the major professor, from inside the major or program. One member of the committee must be from outside the major or program. A term member of the graduate faculty may participate in the direction of a student's master's research if a member of the graduate faculty serves as a co-major professor.

**Doctoral POS Committee** The POS committee for a doctoral program consists of at least five members of the graduate faculty. It must include at least three members, including the major professor, from within the student's major or program. At least one member of the Ph.D. POS committee must be outside the student's major or program. A term member of the graduate faculty may participate in the direction of a student's dissertation research if a member of the graduate faculty serves as a co-major professor.

**The Major Professor** The major professor, who must be a member of the graduate faculty in the student's declared major, serves as chair of the POS committee. If a major professor resigns or retires, he or she may still serve as a major professor as long as another graduate faculty member is appointed to serve as a co-major professor.

**Co-Major Professors** A master's or doctoral degree student may have two or more major professors who serve as co-chairs of the POS committee. Co-chairs may exist in the following instances:

- When a student has a co-major, each of the major fields must be represented by either a different major professor, which will require the designation of co-major professors, or a faculty member in both majors.
- When Ph.D. work is administered through a program in which the largest share of course credits is taken, but the research is conducted in another program or major and supervised by a graduate faculty member in that program, both the dissertation supervisor and a member of the graduate faculty from the program in which the degree will be granted are designated as co-major professors.
- An approved committee for a double degree must include co-major professors from each of the programs. Only certain programs have been approved for double degrees. Students seeking double degrees must clearly note that in the "Comments" section of the "Recommendation for Committee Appointment" form.
- If a term member of the graduate faculty is chosen as major professor for a POS committee, a co-major professor who is a member of the graduate faculty also must be identified.
- When there are co-specializations in the same department, only one major professor is required.

In all cases where there are co-major professors, both must sign on all required forms to be submitted to the Graduate College.

#### **Members of the Committee**

- **Members and Term Graduate Faculty Members.** Any graduate faculty member or term graduate faculty member may serve as a member of a master's or doctoral POS committee.
- **Member(s) from Outside the Student's Major.** The outside member(s) of the POS committee provide relevant specialized knowledge or a different perspective helpful to the planning, execution, and reporting of research.
- **Member(s) from a Minor.** If a minor has been declared, a graduate faculty member from the minor program or interdepartmental minor must serve on the POS committee. The major professor and the representative from the minor field may not be the same person.
- **Retired Faculty.** Retired ISU graduate faculty members may serve as members on master's or doctoral committees as long as they are willing to participate actively.
- **Resigned Faculty.** Graduate faculty members who have resigned but are currently serving on an approved committee may continue to serve in that capacity if they are willing to participate in exams. They may not be appointed to a new committee.
- **Non-member of the Graduate Faculty.** Non-Graduate Faculty Members may serve as non-voting members of a master's or doctoral POS committee. A memo must be attached explaining why the appointment is recommended. Non-voting members are invited but not required to attend all committee functions and to sign the report form.

**Exceptions to the Above** Any request for an exception to the above should be in the form of an explanatory memo submitted with this Committee Appointment form for the Graduate Dean's approval.

**POS Committee Changes** Recommendations for changes in the POS committee for a master's or Ph.D. degree must have the written approval of the student, major professor, DOGE, and all committee members involved in the change before seeking approval of the Graduate College. The "Request to Change Committee Appointment" form is available at [www.grad-college.iastate.edu/forms/forms.html](http://www.grad-college.iastate.edu/forms/forms.html) or in your department. All changes must be approved by the Graduate Dean before an oral is held.

#### **Explanatory notes:**

*Major Department.* The department or interdepartmental program having administrative responsibility for the student and usually responsibility for his or her major. Possible exceptions to this rule are noted in the Graduate Catalog.

*Major.* The area of academic or professional concentration approved by the Board of Regents in which a student chooses to qualify for the awarding of a graduate degree.

*Area of Specialization.* A subdivision of a major in which a strong graduate level program is available. Areas of specialization formally approved by the Graduate College are included parenthetically after the name of the major on official records and transcripts.

*Interdepartmental Program.* An administrative unit not usually functioning as a department, usually headed by a supervisory committee, and offering a degree with major(s) in that subject area. Interdepartmental programs have been officially approved and may offer courses.

*Interdepartmental Major or Minor.* A course of study administered through an approved cooperating department and an interdepartmental major or minor supervisory committee. Interdepartmental executive officer approval is required on both the Committee Appointment and Program of Study forms.

*Minor Department.* The department or interdepartmental program having responsibility for the student's minor.

*Minor.* Students may declare a formal minor in any department authorized to grant a graduate degree and in departments or interdepartmental units authorized to offer a formal minor only. The student must meet the requirements established by the department administering the minor. The minor department executive officer must sign both the Committee Appointment and Program of Study forms. A doctoral student declaring a minor must pass a preliminary oral examination covering that area. Once the preliminary oral examination has been taken, a Ph.D. candidate cannot add a minor.

**APPENDIX G**

**Program Of Study** (instructions below)

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- The Committee Appointment must be approved by the Graduate College before we can review a Program of Study (POS).
- The Program of Study form should be submitted to the Graduate College by the end of the second semester of registration.

1. Student's Name: \_\_\_\_\_ 2. University ID Number: \_\_\_\_\_  
Last First Middle

I Degree Program	
3. Degree Sought: <i>(Indicate 2<sup>nd</sup> degree only if in a double-degree program)</i>	4. Degree Option: <input type="checkbox"/> without thesis <input type="checkbox"/> with thesis or dissertation
5. Department	6. Co-Department (if any)
7. Major	8. Co-Major (if any)
9. Area of Specialization (if any)	10. Co-Area of Specialization (if any)
11. Minor Department(s) (if any)	12. Minor(s) (if any)
13. Projected Examination Dates	a. Preliminary Examination: _____ a. Final Examination: _____ <i>(Master's &amp; ...)</i>

**II Planned Graduate Program**

PLEASE READ THE INSTRUCTIONS BELOW (AND ON THE BACK PAGE) AND NOTE:

- No more than nine credits earned under the Nondegree option can be used toward an advanced degree.
- If transferring graduate credits from another university, a transcript must be attached. See instructions for transfer rules.
- Transfer of graduate credits taken as an ISU undergraduate senior, must be verified at 10A Alumni Hall.
- Memo is required for courses which exceed time limit. See instructions for time limit rules.

Line	University	*	Department Name	Course Number	Semester Credits	**	Course Title <i>(Abbreviate to fit on one line)</i>	Grade	Year
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									

(\*) Mark transfer credits "Tr" or "U"; mark test-out credits "T"    (\*\*) Indicate if "Z" courses.    Is there a second page?     Yes     No

OFFICE USE ONLY	ISU Courses	ISU Research	ISU Total	Tr & T, U	Total Credits	Additional Credits
Total						

**III Approvals**

Name—Major Professor (typed and signed)	Name—Committee Member (typed and signed)
Name—Committee Member (typed and signed)	Name—Committee Member (typed and signed)
Name—Committee Member (typed and signed)	Name—Committee Member (typed and signed)

OFFICE USE ONLY	Student's Signature	Date
	Recommended by: Major DOGE:	Date
	Recommended by Co-Major DOGE (if any):	Date
	Recommended by Minor DOGE (if any):	Date

Copy \_\_\_\_\_ Department \_\_\_\_\_ Major \_\_\_\_\_ Major Professor \_\_\_\_\_ Student \_\_\_\_\_ Co-major \_\_\_\_\_ Minor \_\_\_\_\_  
 Code \_\_\_\_\_

**IMPORTANT-THIS PROGRAM OF STUDY FORM MUST BE TYPEWRITTEN.****Please Note the Following:**

- Have all approved committee members review and sign the form (**an approved committee form must be on file before this POS is submitted**).
- Submit the form to the Graduate College for review, approval, and retention. **This Program of Study form should be submitted to the Graduate College by the end of the second semester in residence.**
- Approved copies will be returned to the administering department (as listed in item #5 and #6 on the POS) to distribute to the DOGE, major professor and the student.
- Courses taken as a special (nondegree undergraduate) student or used to meet undergraduate degree requirements are not acceptable for graduate credit.
- Courses graded Pass/Not Pass (P/NP) may not be listed on the Program of Study.

**Part I: Degree Program**

**Degree Sought:** Using the drop-down menu, insert the same degree as listed on the student's committee form. ["Masters" is not sufficient; cite specific degree (e.g., Master of Accounting, Master of Agriculture, Master of Arts, Master of Science., etc.)].

**Degree Option:** Indicate which option you will pursue.

**Department, Major, and Specialization:** In many cases the name of the **major(s)** (item #7 and #8) will not be the same as the name of the major **department/ program** (item #5 and #6). Indicate an official specialization if any (item # 9). Indicate the co-major or program and/or co-area of specialization of any (# 6 and #8).

**Minor** (items #10 and #11): List if declared. Otherwise, leave blank. In order to have a minor placed on the transcript after graduation, the minor must be approved on the Program of Study, and listed on all examination reports and on the Application for Graduation.

**Examination Dates:** This is only a tentative schedule that does not represent a commitment but is needed by your committee.

**PART II: Planned Graduate Program****ISU Graduate Courses Taken As A Graduate Student**

- List all courses as semester credits.
- Course numbers should indicate the course as it appears or will appear on the transcript.
- Complete the grade and year columns for all courses you have already taken.
- Estimate a year for courses to be taken in the future.
- Specify **minimum** number of research credits required.
- Courses taken as a graduate student that are NOT graduate credit may be shown on the POS but **must** be marked "Z" in the \*\* column. They will not count towards your total credits, but can appear for information purposes.
- If more space is needed, check the "second page" box at the end of **PART II** and complete the supplemental POS page.

**ISU Graduate Courses Taken as an ISU Undergraduate Senior**

- Mark "U" in the single \* column.
- Obtain a certification letter by email from 10A Alumni Hall (Graduation section of the Registrar's Office) and attach to POS.
- Courses must be graduate level with a grade of "B" or better. The grades will not appear on the graduate transcript.
- Courses cannot be used for an undergraduate degree, nor be taken as a special student.

**Graduate Courses Taken at Another University**

- Indicate University name.
- Mark "TR" in the single \* column.
- Have a transcript attached to the POS which states that:
  - Courses were taken as a graduate student.
  - Courses were graduate level.
  - A grade of "B" or better was received.
  - "P" or "S" grades are **NOT ACCEPTABLE** for transfer credits.
- If the POS committee recommends transfer of research credits with "P" or "S" grades, it is responsible for ascertaining if the grade was "B" or better, by letter from the responsible faculty member at the other university.
- **COURSES TAKEN AS AN UNDERGRADUATE AT ANOTHER COLLEGE OR UNIVERSITY MAY NOT BE INCLUDED ON YOUR ISU POS.**

**Time Limits**

- Work for the master's degree should be completed within 5 years. Work for the doctorate should be completed within 7 years. Exceptions to these rules should be addressed in a memo attached to the POS as specified in the *Graduate Student Handbook*.

**PART III: Approvals**

**Obtain signatures indicated.**

**APPENDIX H**

**Program of Study (Supplement)**

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1. Student's Name: \_\_\_\_\_

2. Social Security Number: \_\_\_\_\_

<b>II Planned Graduate Program (continued)</b>									
Line	University	*	Department Name	Course Number	Semester Credits	**	Course Title	Grade	Year
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
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36									
37									
38									
39									
40									
41									
42									
43									
44									
45									
46									
47									
48									
49									
50									

(\*) Mark transfer credits "Tr" or "U"; mark test-out credits "T"      (\*\*) Indicate if "Z" courses.

- Copy     
  Department     
  DOGE     
  Major Professor     
  Student     
  Co-major     
  Minor     
  Code

# Request for Preliminary Oral Examination

For Doctor of Philosophy Candidates

Graduate College

Student's Name: Last	First	Middle	Social Security Number
Department(s)			
Major(s)			

## Instructions for Student

- Set the date, time and place for the preliminary oral examination with your POS committee members.
- Type or print clearly on this form.
- Submit all 4 copies of this form to the Graduate College Office **AT LEAST TWO WEEKS BEFORE** the date of the preliminary oral examination and **AFTER** checking that the following conditions have been met:
  1. Full admission status as a Ph.D. candidate.
  2. "Recommendation for Committee Appointment" form approved by the Graduate College.
  3. "Program of Study" form approved by the Graduate College.
  4. English examination requirement met.
  5. Not on probation.
  6. Time limit not exceeded for coursework.
  7. Departmental examination (if any) passed.
  8. Registration for **AT LEAST THE EQUIVALENT OF TWO CREDIT HOURS** during the term in which the preliminary oral examination is taken.

## Planned Schedule for the Preliminary Oral Examination

Date	Time	Place
Requested by Major Professor(s) (typed or printed & signed)		Date
Requested by Director(s) of Graduate Education for the Major(s) (typed or printed & signed)		Date

PLEASE NOTIFY THE GRADUATE COLLEGE IF THE EXAMINATION IS NOT HELD AS SCHEDULED

## Graduate College Action

Request Approved	Date
Request Denied	Date
Comments or Conditions:	

## After the Graduate College's Approval

Upon approval of this request, the Graduate College will send the Graduate Department Secretary; (1) the "Report of Preliminary Oral Examination" form for reporting the examination result, (2) three copies of the approved "Request for Preliminary Oral Examination" form to be distributed as indicated on the bottom of the form. **ALL COMMITTEE MEMBERS ARE REQUIRED TO ATTEND THE PRELIMINARY ORAL EXAMINATION AND SIGN THE REPORT FORM.**

APPENDIX J

IGERT TRAINEE REQUIREMENTS CHECKLIST

Name: \_\_\_\_\_ Committee members and departments: \_\_\_\_\_
ISU entry date: \_\_\_\_\_ 1. Major prof: \_\_\_\_\_, \_\_\_\_\_
Major: \_\_\_\_\_ 2. Co-major prof: \_\_\_\_\_, \_\_\_\_\_
Home dept: \_\_\_\_\_ 3. Member: \_\_\_\_\_, \_\_\_\_\_
Co-major: \_\_\_\_\_ 4. Member: \_\_\_\_\_, \_\_\_\_\_
Minor: \_\_\_\_\_ 5. Member: \_\_\_\_\_, \_\_\_\_\_

Degree Requirements and Training Activities

Research Exploration Rotations: Indicate labs and rotation dates (3 required)

1. Lab: \_\_\_\_\_ from: \_\_\_\_\_ to: \_\_\_\_\_
2. Lab: \_\_\_\_\_ from: \_\_\_\_\_ to: \_\_\_\_\_
3. Lab: \_\_\_\_\_ from: \_\_\_\_\_ to: \_\_\_\_\_

In each blank below, indicate the date (mm/dd/yy) or semester and year the requirement was met.

\_\_\_\_\_ Joined laboratory of major professor

\_\_\_\_\_ Committee Appointment form approved (date filed \_\_\_\_\_)

NOTE: This form must be filed by the end of the first year of study.

\_\_\_\_\_ 1st POS Meeting: Program of Study (POS) and Research Plan approved by the POS Committee

(date filed \_\_\_\_\_) NOTE: This should be approved by 1st semester of 2nd year.

\_\_\_\_\_ Teaching (Teaching Assistantship or Teaching Seminar) indicate courses taught or attended

\_\_\_\_\_
\_\_\_\_\_
\_\_\_\_\_

\_\_\_\_\_ Internship: [ ] Academic [ ] Industrial Location: \_\_\_\_\_

\_\_\_\_\_ International Research Experience: Location: \_\_\_\_\_

\_\_\_\_\_ Preliminary exam (Ph.D. only)

This should be taken by first semester of third year. The preliminary examination must include a written component in the form of a research proposal

\_\_\_\_\_ Final examination passed

Thesis title: \_\_\_\_\_

## IGERT Course and Training Requirements

### Required Core Courses

Semester/Year	Grade	
		<b>Gen 411 or GDCB 511 Molecular Genetics, 3 cr (or equivalent) AND</b>
		<b>BCB 548/567 Fundamentals of Genome Informatics, 3 cr OR</b>
		<b>BCB 594/568 Advanced Genome Informatics, 3 cr OR</b>
		<b>BCB 569 Structural Genome Informatics, 3 cr OR</b>
		<b>BCB 570 Computational Functional Genomics and Systems Biology, 3 cr</b>

### Advanced Course Requirements

At least six credits, consisting of three from Group I and three from Group II, are required. (NOTE: This is a partial list; with the approval of the POS Committee and IGERT director, other courses may be used to fulfill requirements.)

Semester/Year    Grade

#### Group I. Molecular Biology (6 credits required)

		An Sci 556 Current Topics in Genome Analysis, 3 cr, Alt S
		BCB 550 Evolutionary Problems for Computational Biologists, 3 cr, F
		BCB 538 Computational Genetics & Evolution, 3 cr, Alt S
		BCB 539 Statistical Methods for Computational Biology, 3 cr, Alt S
		BBMB 404 Biochemistry, 3 cr, F
		BBMB 405 Biochemistry, 3 cr, S
		BBMB 451 Physical Biochemistry, 2 cr, F
		BBMB 501 Comprehensive Biochemistry I, 4 cr, F
		BBMB 502 Comprehensive Biochemistry II, 4 cr, S
		BBMB 531 Structure and Reactivity of Biomolecules, 1 cr, F
		BBMB 541 Computational Biochemistry, 1 cr, F
		BBMB 542 A, B, C, D, E, 1 cr per module, F, S, SS
		BBMB 551 Molecular Biophysics, 3 cr, F
		BBMB 653 Protein Chemistry–Physical Methods, 1 cr, Alt S
		Gen462/EEOB 562 Evolutionary Genetics, 3 cr, S
		GDCB 520 Genetic Engineering, 3 cr, Alt F
		EEOB 563 Molecular Phylogenetics, 3 cr, F
		EEOB 566 Molecular Evolution, 3 cr, F

#### Group II. Computer Science/Mathematics/Statistics (3 credits required)

		BCB 548* (will become 567) Fundamental of Genome Informatics, 3 cr, F
		BCB/Cpr E/Com S 549 Advanced Algorithms in Computational Biology, 3 cr, S
		BCB 550 Evolutionary Problems for Computational Biologists, 3 cr, F
		BCB 551 Computational Techniques for Genome Assembly and Analysis, 3 cr, F
		BCB 594* (will become 568) Advanced Genome Informatics, 3 cr, S
		BCB 596 Genomic Data Processing, 3 cr, F
		BCB 597 Introductory Computational Structural Biology, 3 cr, F
		Com S 311 Design and Analysis of Algorithms, 3 cr, F S
		Com S 363 Introduction to Database Management Systems, 3 cr, F S
		Com S 461 Database Systems Concepts and Internals, 3 cr, F
		Com S 472/572 Principles of Artificial Intelligence, 3 cr, F
		Com S 474 Elements of Neural Computation, 3 cr, S
		Com S 511 Design and Analysis of Algorithms, 3 cr, F
		Com S/Cpr E 526 Introduction to Parallel Algorithms and Programming, 4 cr, F
		Com S 561 Principles of Database Systems, 3 cr, S
		Com S 573 Machine Learning, 3 cr, Alt S
		Com S 574 Intelligent Multiagent Systems, 3 cr, S
		Com S 611 Advanced Topics in Analysis of Algorithms, 3 cr, Alt S
		Com S 672 Advanced Topics in Computational Models of Learning, 3 cr, Alt S
		Com S 673 Advanced Topics in Computational Intelligence, 3 cr, Alt S
		EE 547 Pattern Recognition, 3 cr, F

Semester/Year \_\_\_\_\_ Grade \_\_\_\_\_

**Group II. Computer Science/Mathematics/Statistics, continued:**

- \_\_\_\_\_ \_\_\_\_\_ BCB 594\* Computational Molecular Biology, 3 cr, S
- \_\_\_\_\_ \_\_\_\_\_ Math 304 Introductory Combinatorics, 3 cr, F
- \_\_\_\_\_ \_\_\_\_\_ Math 307 Matrices and Linear Algebra, 3 cr, F, S, SS
- \_\_\_\_\_ \_\_\_\_\_ Math 314 Graphs and Networks, 3 cr, S
- \_\_\_\_\_ \_\_\_\_\_ Math 378 Optimization & Modeling with Evolutionary Computation, 3 cr, S
- \_\_\_\_\_ \_\_\_\_\_ Stat 500 Statistical Methods, 4 cr, F
- \_\_\_\_\_ \_\_\_\_\_ Stat 536 Statistics for Population Genetics, 3 cr, Alt F
- \_\_\_\_\_ \_\_\_\_\_ Stat 537 Statistics for Molecular Genetics, 3 cr, Alt F
- \_\_\_\_\_ \_\_\_\_\_ Stat 542 Theory of Probability and Statistics I, 3 cr, F
- \_\_\_\_\_ \_\_\_\_\_ Stat 543 Theory of Probability and Statistics II, 4 cr, S

\* Course may not be used to meet BOTH core course and advanced group requirements

**Required Seminars and Activities**

Semester/Year \_\_\_\_\_ Grade \_\_\_\_\_

**BCB 593 Workshop** (at least 2)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**BCB 690 Student Seminar** (Spring) (at least 2; 2 oral presentations required)

Title of oral presentation \_\_\_\_\_

Title of oral presentation \_\_\_\_\_

Title of oral presentation \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**BCB 691 Faculty Seminar** (Fall) (at least 1 required)

\_\_\_\_\_  
\_\_\_\_\_

**Scientific Ethics Day** (during Fall Orientation)

\_\_\_\_\_

**Bioethics Training:** BCB students are required to take BCB-approved bioethics courses or course modules. M.S. students are required to take at least one BCB-approved bioethics course/module (0.5 credit minimum). Ph.D. students are required to take at least two bioethics modules or another BCB-approved bioethics course (1 credit minimum). The required sessions in general scientific ethics offered during Fall orientation (above) do not count toward this bioethics course requirement. Students supported by special training grants may have additional bioethics training requirements.

**Agron/Gen/PIP 565A** Professional Practices in Research, .5 cr, S

\_\_\_\_\_

**Agron/Gen/PIP 565B** Intellectual Property and Industry Interactions, .5 cr, S

\_\_\_\_\_

**Agron/Gen/PIP 565C** Life Science Ethics, .5 cr, S

\_\_\_\_\_

**Annual Joint Bioinformatics Symposia:** Iowa State, New Mexico State and The University of Iowa conduct an annual joint symposia in which IGERT trainees are required to participate throughout the course of graduate training.

Month/Year attended	Topic
_____	_____
_____	_____
_____	_____
_____	_____

**Annual Joint Bioinformatics Symposia, continued**

Month/Year attended	Topic
_____	_____
_____	_____
_____	_____

**Comments and Clarifications**

Describe course waivers, transfers, etc. Where appropriate, include date of action and attach memo of explanation.

\_\_\_\_\_

**Additional Information**

When listing publications and presentations, please use the citation format as noted.

**Published journal articles:**

Authors [last name, then initials for first and middle name]. (Year in parentheses). Article title [capitalize only first word, word after colon and proper nouns]. *Publication name* [in italics, with capitals where usually used]. Volume number(issue number):pages.

\_\_\_\_\_

**Conference publications:**

Authors, paper title, conference name, year, pages.

\_\_\_\_\_

**Conference presentations:**

Authors, presentation title, conference name, date, city, state, country, organization.

\_\_\_\_\_

**Other (books, book chapters, patents applied for or awarded):**

\_\_\_\_\_

**Publications and manuscripts in preparation:**

Authors, title, publications to which the paper has been or is expected to be submitted.

\_\_\_\_\_

**Signatures**

\_\_\_\_\_  
Student (sign)

\_\_\_\_\_  
Date

\_\_\_\_\_  
Major professor signature (type or print, and sign)

\_\_\_\_\_  
Date

\_\_\_\_\_  
Co-major professor signature (type or print, and sign)

\_\_\_\_\_  
Date

