Texas A&M University

Faculty of Genetics

2017-2018

First Year Graduate Student Handbook

http://genetics.tamu.edu

Graduate Program Committee

Faculty of Genetics

Texas A&M University

Please submit any suggestions or corrections to the Genetics Office

Room 109A Biochemistry/Biophysics Building, (979) 458-2284

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HOWDY!

We are pleased you have chosen the Genetics Program of Texas A&M University to pursue your graduate studies. This Ph.D. Handbook provides a description of the doctoral program, what is expected from you and when, and all sorts of handy information about registration and forms, etc. It is important to note, however, that the TAMU Graduate Catalog for the 2017-2018 academic year is the official document stating the rules and regulations under which your pursuit of a graduate degree is to be conducted. We strongly suggest that you read the Genetics section under Interdisciplinary Degree Programs.

Again, we speak for the whole Faculty of Genetics in extending our warmest welcome to you, our new students and colleagues. Have a good year!

Dorothy Shippen
Chair, Faculty of Genetics

Jessica Elswood
President, Genetics Graduate Student Association

TEXAS A&M UNIVERSITY

Texas A&M University is a public institution and flagship of the Texas A&M University System that is dedicated to the development and dissemination of knowledge in diverse academic and professional fields. The University is committed to assist students in their search for knowledge to help them understand themselves, their cultural and physical environment, and to develop in them the wisdom and skills needed to assume responsibility in a democratic society. The University assumes as its historic trust the maintenance and enhancement of an intellectual environment that encourages the development and expansion of the human mind and spirit. While continuing to fulfill its mission as a Land-Grant/Sea-Grant/Space-Grant institution, the University is evolving and expanding its role to meet the changing needs of state, national, and international communities as a member of the Association of American Universities, an international organization of pre-eminent research-intensive universities.

Established in 1876 as the first public college in the state, Texas A&M University today has become a world leader in teaching, research, and public service. Located in College Station in the heart of Texas, it is centrally situated among three of the country's 10 largest cities -- Dallas, Houston, and San Antonio. Fall, 2016 enrollment was 66,426 which making Texas A&M the nation's second largest university campus. Students represent every state and 123 countries.

Research: Texas A&M's research budget for fiscal year 2016 was more than $866 million. The university's research expenditures resulted in a ranking of 16th nationally -- and first in the South and Southwest -- by the National Science Foundation.

Facilities: The University's 5,200-acre campus, which includes a 434-acre research park, is one of the largest in the nation and is valued at more than $1 billion. In addition to the College Station campus, the university has branch campuses in Galveston, Texas and Doha, Qatar, and operates the the Soltis Research and Education Center near the town of San Isidro, Costa Rica, the Santa Chiara Study Center in Castiglion Fiorentino, Italy, and the Texas A&M University Center in Mexico City.

Cores: Texas A&M supports a wide range of core facilities housing cutting-edge equipment and technological capabilities to support genetic, genomic, molecular biology and bioinformatics research and training. A list and links to core facilities supporting research in genetics can be found at (https://genomics.tamu.edu/all-texas-am-cores), and includes:

Computational Biology

Texas A&M Institute for Genome Sciences and Society Bioinformatics Workspace: Provides bioinformatics services and training. Services include a computer cluster tailored for bioinformatics and computational biology applications. The cluster hosts a borad range of tools and software packages. The computer cluster is accessible by command line or a Galaxy interface. A free help desk is available, as well as project assistance and programming service and a BLAST server.

AgrilLife Genomics and Bioinformatics Services: Provides bioinformatics services including consultation and experimental design, and bioinformatics analysis and processing.

Center for Translational and Environmental Health Research Genomics and Bioinformatics Facility Core: Provides support for gene expression analysis using microarray and deep sequencing technology, including both basic and advanced analysis of expression data.

Laboratory for Molecular Simulation: Offers training in molecular modeling and computational chemistry. Advanced modeling software is available to perform quantum calculations on small molecular or solid systems and molecular mechanics/dynamics modeling for large systems such as proteins, DNA, nanomolecules, polymers, solids, and liquids. The LMS also provides training in Linus and support for faculty and students that wish to incorporate molecular modeling in the course material.

Protein Folding Server: Provides access to computational techniques to map a protein's potential landscape, and to generate transitional motions of a protein to the known native state from unstructured conformations or between use-specified conformations. Protein conformations can be submitted by PDB ids or structures can be uploaded in PDB format.

TAMU Supercomputing Facility: Provides access to high performance research computing resources and user support. Systems include Ada, a 17,500-core IBM NeXtScale Cluster, along with a variety of software and data storage systems.

Molecular Biology and Genomics

Texas A&M Institute for Genome Sciences and Society Genomics Workspace: Maintains shared equipment to support genomics-based research. Training and experimental support for library preparation and sequence generation including a Fluidigm Biomark HD system for high-throughput real-time or end-point PCR in nanoliter columes, a Fluidigm C1 single-cell system for extraction and isolation of nucleic acids and template preparation for sequencing or qPCR from single cells, Bio-Rad QX200 AutoDG Droplet Digital PCR, and Illumina NextSeq 500 and MiSeq sequencers. Additional equipment available for use is an Illumina iScan, BioTek Cytation 3 Cell Imaging Microplate Reader, Bio-Rad Bio-Plex 200 for Luminex xMAP technologies, Eppendorf epMotion 5075 robot, Bio-Rad CHEF-DR II pulsed-field gel electrophoresis system, Promega Maxwell 16 for automated nucleic acids isolation, Bio-Rad CSX96 real-time PCR unit, Agilent Tape Station 2200 for nucleic acid and protein QC, Qiagen TissueLyser II, and a Miltenyi GentleMACS for tissue dissociation.

AgriLife Genomics and Bioinformatics Services: Provides next generation sequencing and library preparation. Equipment includes Illumina HiSeq2000, HiSequ2500v4, and MiSeq.

Center for Translational Environmental Health Research Genomics and Bioinformatics Facility Core: Provides support for gene expression experiments using microarray and deep sequencing technology, realtime RT_PCR training and access to an ABI 7900 HT, RNA quality assessment on an Agilent Bioanalyzer, and microRNA quantification by PCR array.

AgriGenomics Core: Provides genomics methods and expertise for faculty and students in the soil and crop community. Capabilities and equipment available include QIAzcel, and AATI, ABI3130 capillary electrophoresis systems, Kbiosciences Lite Pipeline for KASAP SNP assays, and an Accuri flow cytometer with autoloader.

DNA Technologies Core: Provides Sanger sequencing and a Sigma Oligo Distribution Center. The core focuses on DNA testing, fragment analysis and microorganism ID.

Gene Technologies Laboratory: Provides Sanger sequencing of unique DNAs, oligonucleotides, and an AutoGen 850 Alpha for DNA purification. Specialized reagents and supplies for DNA analysis are also available.

Gene Technologies Laboratory: Provides Sanger sequencing of unique DNAs, oligonucleotides, and an AutoGen 850 Alpha for DNA purification. Specialized reagents and supplies for DNA analysis are also a available.

Laboratory for Genome Technology: Offers Sanger sequencing services on an ABI 3130x1 and DNA fragment analysis on an ABI377 and two LICOR instruments.

Molecular Cytogenetics and Genomics Laboratoy: Performs a wide range of cytogenetic, molecular, and DNA-based testing. Services include chromosome analysis by karyotyping and FISH.

Bioseparation Lab: Provides an environment for bioprocess engineering with an emphasis in recombinant protein recovery from plant and microalgae systems. Can assist with developing novel and effective strategies for extraction and purifications of recombinant and native biomolecules from plants.

Cell and Chemical Biology

Flow Cytometry Core: Provides capabilities for flow cytometry and cell sorting. Supports immunofluorescence assays, assays for DNA and cell cycle content analysis, apoptosis, cell proliferation, phagocytosis and functional expression of p-glycoprotein. Equipment includes Beckman Coulter MoFlo® Astrios™ High-Speed Cell Sorter and a Becton Dickinson FACSCalibur™ Analyzer.

Histology Laboratory: Provides paraffin and frozen sample processing, sectioning, and staining services. Many common and special histology stains are available.

Center for Translational Environmental Health Research Genomics and Bioinformatics Facility Core: Provides analysis of cellular bioenergetics with a Seahorse Biosciences XF 24 Analyzer.

Laboratory for Biological Mass Spectrometry: Provides expertise in mass spectrometry methodology, instrumentation, and informatics including Electron Ionization (EI), Chemical Ionization (CI), Atmospheric Pressure Chemical Ionization (APCI), Electrospray Ionization (ESI), Matrix Assisted Laser Desorption Ionization (MALDI) and MS/MS analysis of peaks in ESI, APCI, and MALDI spectra. The services cover proteomics as well as molecular-level research in various "omics" related researches, i.e., petroleomics, metabolomics, lipidomics, and glycomics. This includes analyses of compounds from

small organic molecules to macromolecules including proteins, oligonucleotides, polymers, and dendrimers. Instruments include Applied Biosystems Voyager-DE STR, Applied Biosystems PE SCIEX QSTAR, Thermo Scientific DSQ II GCMS, Thermo Scientific LCQ-DECA, Applied Biosystems 4700 Proteomics Analyzer, Applied Biosystems 4800 TOF Analyzer, Applied Biosystems MDS SCiex 4000 QTRAP, Bruker Daltonics solariX Qq-FTMS, and Waters Synapt G2 HDMS.

Biomolecular NMR Laboratory: Provides access to spectrometers suited for solution-state NMR studies on biological macromolecules like proteins and nucleic acids. Instruments include a Bruker AVANCE III 800 MHz equipped with 5 mm TCI cryoprobe, two Bruker AVANCE III HD spectrometers (600 MHz and a 500 MHz) and a Varian 600 MHz.

NMR Facility: Provides a broad array of NMR services including X-Ray Crystallography, Mass Spectrometry, and Elemental Analysis. The facility provides equipment maintenance support, user training, and spectroscopic service. Instruments include Avance 500 (500 MHz Cryoprobe system with high sensitivity for small 1H, 1H{13C} and 1H{15N] samples), NMRS 500RM (500 MHz system with 4 channels and H/F/P/C/ quad probe for 1H{31P}{19F}), Inova 500 (500 MHz H/C system), Inova 500B (500 MHz system with 2 RF channels, Indirect Detection probe and H/F/P/C/ quad probe), NMRS 500, Avance III 400 (400 MHz broadband spectrometer with sample change), Avance 400 (400 MHz Solid State NMR with 2.5, 4, and 7 mm CP/MAS probes), Inova 400 (400 MHz system with 31P – 15N broadband probe), Inova 300 (300 MHz instrument with H/F/P/C quad probe) and Mercury 300 (300 MHz H/C system).

X-Ray Diffraction Laboratory: Provides full-service X-ray Diffraction laboratory offering state of the art instrumentation for the analysis of solid materials. Services include single-crystal and powder diffraction for chemistry, materials sciences and pharmaceuticals. Equipment includes three Burker single-crystal APEXii CCD Diffractometers, one Bruker GADDS/Histar diffractometer, and two Bruker powder diffractometers.

Protein Chemistry Lab: Provides support for advanced protein chemistry and proteomics research through state-of-the-art instrumentation, systems, software, technical expertise, and training. Instruments include automated Edman protein sequence analysis, amino acid analysis, protein gel electrophoresis and electroblotting, DALTSix for large-scale 2D gels, Typhoon trio fluorescent imager, Ettan robotic ysstems for high-throughput picking,

digesting and spotting, high pressure liquid chromatography, MALDI_TOF MS, and electrospray MS.

Microscopy

Image Analysis Lab: Provides state of the art microscopy technologies including UV laser cutting/LCM, fluorescence imaging, transmitted light imaging, live-cell imaging, FRAP, FLIP, photo activation/conversaion, FRET, FLIM, transmission electron microscopy, and image processing, analysis and quantification. Equipment includes Zeiss ELRA S.1 (SR-SIM) Super resolution Microscope, Zeiss LSM 780 NLO Multiphoton Microscoope, Zeiss TIRF3, Zeiss510 META Confocal Microscope, Zeiss Stallion Digital Imaging Workstation, Zeiss Digital Imaging Workstation, WEI Transmission Electron Microscope, Veritas Microdissection System, and a BioTek Synergy 4 Microplate Reader.

Microscopy and Imaging Center: Provides access and training in microscopy and imaging technologies such as deconvoluation of wide-field fluorescence images and correlative LM-EM. Instruments for light microscopy include Olympus FV1000 confocal microscope, Multiphoton Non-linear Optical Microscope (NLOM), Zeiss Axiophot, and Nikon Stereo Photomicroscope; for scanning electron microscopy FEI Quanta 600 FE_SEM, Tescan Vega SEM, and a Zyvex S100 Nanomanipulator; and for transmission electron microscopy FEI Tecnai G2 F20 FE-TEM, GEI Tecnai G2 F20 ST FE_TEM Materials, JOEL 1200 EX TEM, and JOEL JEM-2010 TEM.

Organismal Facilities

Texas Insitute for Genomic Medicine: Provides services for transgenic, knockout and embryonic stem (ES) cell manipulation in mice. Services include pronuclear injection, blastocyst injection, sperm cryopreservation, embryo cryopreservation, rederivation via IVF, embryo transfer, colony maintenance, gene targeting and access to ES-cell based gene trap libraries.

BioAquatics Facility: Provides aquatic animal facility for diverse species (fish, reptiles, amphibians, crustaceans, mollusks, and cnidarians). The Facility comprise animal holding space, laboratories, feed and storage area, and recirculating air and waters supply systems.

Plant Growth Facilities: Provides twenty0two growth chambers and 12,000 sq ft of greenhouse space for transgenic and non-transgenic plants. A greenhouse amnex has an additional

25,232 sq ft of greenhouse space and a 16,473 sq ft headhouse. A variety of lighting controls are available to simulate different growth conditions.

Instrumentation

Biology Instrumentation Shop: Provides research and teaching equipment repair needs. Maintains generic parts and hardware and catalog of manufacturer parts. Personnel have over 60 years combined experience on most research instrumentation including electronics, spectrophotometric, electro-mechanical, vacuum, environmental control systems, refrigeration, robotics, sterilization, custom plexiglass fabrication, as well as a myriad of other basic design, repair, consulting, and planned maintenance operations.

Chemistry Electronic Shop: This facility will coordinate the electronics design, construction, and repairs of major instrumentation. Fuses, wire, switches, and small electronic parts are available. Experience with HP printer repairs.

Physics Electronic Shop and Parts Store: Provides services for the engineering, design, construction, calibration, testing, and repair of a wide range of scientific & technical electronic equipment. In addition, the Electronics Shop provides a "self-service store" of over 7000 parts commonly used in scientific equipment.

Chemistry Glass Shop: Fabrication and repair of instructional/research glassware. Stock sizes of glass tubuing, rod, ground glass joints, stopcocks, glass-metal seals, etc., are available.

Chemistry Metal Shop: Fabricationof instructional/research instruments and equipment; also metal bar, screws, tube, and pipefittings and brass and stainless steel are available.

Physics Machine Shop: Provides fabrication of prototype scientific instruments, as well as on-site inspection, estimates, consulting, machining, welding, and repairs. The Machine Shop personnel will work from a spectrum of rough sketches to CAD designs to create machined products.

BRYAN/COLLEGE STATION

Bryan/College Station is located in Brazos County in east-central Texas, about 140 miles from the Gulf of Mexico. It lies in an area known as the Post Oak Belt, and there is a prevalence of post oak, blackjack oak, elm and hickory trees. The terrain is characterized by gently rolling

hills. Bryan/College Station are "sister cities" located in Brazos County with a combined population of almost 250,000.

The climate is classified as humid sub-tropical with hot summers. The average annual temperature is 68 degrees with average humidity at 71%. Winters are mild, with short spells of cold weather, lasting two to three days. Occasionally, the temperature can drop as much as 30 degrees in one hour; these are caused by polar Canadian air currents and are termed "Blue Northers." Snow is rare. Spring weather is variable with many thunderstorms. Summer is essentially invariable, with an average maximum temperature of 92 degrees and high humidity (it gets hot and stays hot!).

Housing: Housing in Bryan/College Station is plentiful, but it is important to start looking early for accommodations that are satisfactory and affordable. There are several services that can help you find a place to live. Do not forget that it will get hot, and air conditioning is almost a must!!!

The Off Campus Student Housing Office (http://studentlife.tamu.edu/agoss.offcampushousing) is on main campus. You can call them at (979) 845-1741 during the hours of 8am - 5pm, Monday through Friday. In addition to publishing The Off Campus Survival Manual, this department has a number of useful services such as Adult and Graduate Student Services, Women's Programs, and the Housing Vacancy Listing through AggieSearch (https://aggiesearch.tamu.edu) which is a listing of houses, apartments, duplexes, rooms in houses, mobile homes and condominiums. This office also has roommate referral services and tenant/landlord rights and responsibilities information. In addition, the Off Campus Student Housing Office conducts surveys of apartment prices around town and has useful maps and other information for you.

Transportation: The Bryan/College Station area is serviced by Easterwood Airport (CLL) on the TAMU campus. Daily flights are available on American Airlines from Dallas-Fort Worth International Airport (DFW) and United Airlines from George Bush Intercontinental Airport (IAH) in Houston. A variety of shuttle services are also available to and from Houston. Like most moderate sized cities in the US, public transportation is available in Bryan/College Station.

However a car, or access to a car, is still very helpful. Uber and commercial taxi services are available throughout the area. Area transportation provides can be found at the Bryan/College Station Convention and Visitor Bureau site <http://www.visitaggieland.com>.

Texas A&M provides an extensive on- and off-campus bus systems that is free for all students. Maps, with real-time tracking of buses, and information on campus parking are available at the Transportation Services website <http://transport.tamu.edu>. The TAMUMobile app available for smart phones provides real-time bus tracking, route maps, virtual campus tours, event calendar and a variety of other useful information.

The Brazos Transit District (The District) provides hourly fixed bus routes throughout Bryan/College Station that is also free for all students. Unlike the TAMU bus system focused on the TAMU campus, The District provides transportation to shopping and other destinations. Maps and timetables are available at The District website <http://www.btd.org>.

EMERGENCIES: In case of emergency, call 911 for an ambulance, the police, or a fire department. If you are calling from a campus telephone, you will need to dial 9-911, unless you are dialing from a TAMHSC building, in which case it is 8-911.

HEALTH CARE: Medical and psychological health services are available on campus at Beutel Student Health Center. The non-emergency number is (979) 845-1525. You can schedule an appointment online or at (979) 458-8250.

KEY ADMINISTRATIVE FACULTY AND STAFF

Dorothy Shippen, Ph.D., Chair, FOG ……..…….862-2342
dshippen@tamu.edu, Office: Bio/Bio, Room 413A

Carol Vargas, Genetics Program Office…….…….…… 458-2284
carolvargasb@tamu.edu, Office: BIO/BIO, Room 109A

Tamara Torres…….. 458-2284
Tamara.torres@tamu.edu, Office: BIO/BIO, Room 109A

If Dr. Shippen is out of town and a signature is needed, the following faculty have signature authority:

David Threadgill……436-0850
dwthreadgill@tamu.edu, Office: 428 Reynolds Medical Building

Sarah Bondos……436-0807
sebondos@tamhsc.edu, Office: 258A Reynolds Medical Building

Members of Genetics Administrative Committees can be found at:
http://genetics.tamu.edu/faculty/committees

THE GENETICS GRADUATE STUDENT ASSOCIATION (GGSA)

Purpose of the Organization

The Genetics Graduate Student Association (GGSA) is an advocacy and social group for graduate students with research interest in Genetics. A member of the GGSA must be enrolled with graduate classification at Texas A&M University, classified as a Genetics major and in good standing with the University. The organization meets each month to socialize, to address any academic issues they may have within the program, and issues within the University. The GGSA has representatives on the Recruiting, Graduate Curriculum, and Graduate Advising Committees of the Faculty of Genetics so that they can report their issues within the program, which are then passed on to the Executive Committee of the Genetics Faculty. University issues are passed on to the Graduate Student Council (GSC). The GGSA also has organized events throughout the year such as Fall Picnic, Tailgate Party, volleyball, games, etc.

A list of students serving as officers and on committees in the GGSA can be found at:
https://g2sa.tamu.edu/meet-the-officers/

THE GRADUATE PROGRAM IN GENETICS

The Doctor of Philosophy (PhD) graduate program in Genetics provides students with specialized training through course work, research, and teaching. The program has established requirements in these areas that must be satisfied by all students. The program requirements exist so that graduate students will receive a thorough understanding of their area of specialization as well as intensive experience in their particular field of research.

Additional requirements for graduate degrees are established by the Office of Graduate and Professional Studies (OGAPS). In most cases, the Genetics requirements are more explicit than the OGAPS requirements.

It is your responsibility as a graduate student to insure that you have met all program, graduate, and university requirements for your degree. The purpose of this handbook is to describe both the programs and the University requirements so that you have a single, accessible reference. Please keep this book handy and refer to it as you progress through pursuit of your degree. Additional information can be obtained from the Graduate advising office for Genetics, located in Bio/Bio, Room 109A; E-mailing: genesec@tamu.edu; Tel: (979) 458-2284.

To ensure that all students are making adequate progress towards their degree, the Faculty of Genetics has established a schedule for meeting specific requirements. This schedule allows students to make reasonable progress toward a degree while assuring that all major requirements are met in a timely fashion. Additionally, it enables the Faculty of Genetics executive committee to perceive and correct problems experienced by students.

Timeline of Milestones: The following time schedule should be met for all Genetics PhD graduate students (semester refers to a regular 17-week semester and does not include summer terms). A more detailed deadline list can be found in Appendix I, Expectations of Genetics Graduate Students.

Choice of Major Professor	End of First Semester
Degree Plan Filed with OGAPS	Before Third Semester
Proposal/Preliminary Examination.	By End of Fifth Semester
Final Defense	By End of Fifth Year

It is expected that all students will adhere to this schedule. Students who do not meet deadlines will be contacted by the Chair of the Faculty of Genetics to insure that adequate progress is being made. In most cases, a letter from the student's major professor to the Chair of the Faculty of Genetics, explaining why the schedule was not met, will be sufficient for continuation. **If students experience recurring problems in meeting the schedule, registration may be blocked.** In these cases, the Chair of the Faculty of Genetics and the student's major professor will meet.

Graduate studies are demanding. You are no longer an undergraduate. Graduate studies are no less demanding, from the effort to the time commitment, than a professional degree. If anything, they are far more challenging since most of your day will not be scheduled for you like a professional curriculum. Rather, you MUST be self-motivated in order to succeed. You are being paid almost $50,000 per year to earn your degree, most of this coming from your Major Professor's research grants that have specific deliverables for which they are responsible. Your stipend is only half your pay, the other half being the tuition expenses being paid for you. If you approach graduate school as an 8-5 job or with the flexibility of an undergraduate, you likely will not finish your degree. Your days should be for classes and lab work. Any work required for your courses should be done in the evening or weekends and not substituted for lab time. At a minimum, while taking 9 CR of research hours, you are in essence being paid for 47 hours per week (20 hours through your stipend and 27 hours for your research-related education [9 CR research hours x 3 hours for each CR]). Even when not taking research hours, your time in the lab is critical to your success.

Rotations: Although some students may enter with a specific major professor identified, all students must complete the three laboratory rotations during their first semester. Rotations acquaint new students with the research programs in their area of interest in genetics and across campus, providing a perspective on approaches and procedures used in modern genetics, as well

as useful contacts in other labs. Rotations are also important to ensure students obtain a feel for the work environments of labs they may consider joining. Upon arrival, students receive written information about the research program in each professor's laboratory, and have the opportunity to interact with faculty during short faculty presentations scheduled during orientation. Following the new student orientation, students submit names of three laboratories (to the Genetics Administrator and/or the Chair of the First Year Advising Committee) in which they would like to perform the first rotation. Requests for the second and third rotations will be due approximately one week before these are scheduled to begin. Rotating students may enroll for up to 2 hours of credit in Genetics 685. Students have the option to begin rotations during the summer before the fall semester, if desired. The professor, in whose lab the student is rotating, will assign A-F grades along with a written evaluation of the student's work in that lab. You will find a schedule of rotation due dates and forms for your rotation lab choices included in Appendix V of this handbook.

Choice of Major Professor: Students will identify a Major Professor by the end of their first full semester, which will allow you to begin research in earnest toward the PhD degree in the second semester. All students will provide the Genetics Administrator and/or the Chair of the Student Advising Committee a rank order of their choice for major professor after discussing opportunities with their rotation professors. The First Year Advising Committee will match students with a Major Professor based upon both the student and professor's preferences. If additional rotations are needed to find an appropriate lab, students can perform these in the spring semester. Occasionally, working equally under the direction of two faculty members can enhance a student's graduate program. To accept a Genetics Student, the Major Professor must sign the Expectations for Graduate Training and Support form in Appendix II.

Thesis Committee: A Thesis Committee supervises a student's coursework and research, examines a student's progress, and approves all documents required for the PhD degree. The Thesis Committee, chaired by the Major Professor, is the primary source of direction and support for a student's research and academic program. The Thesis Committee should be constituted

soon after the choice of Major Professor to provide the student with maximum input on course choices. The Thesis Committee must have at least three members in addition to the Major Professor. At least one member must come from a department outside your "home" department. Your Major Professor MUST be a FULL member of the Faculty of Genetics. Students should familiarize themselves with the members of their Thesis Committee as soon as possible. This Thesis Committee will approve the degree plan, read and critique the proposal and thesis/dissertation, and administer the preliminary exam and oral defense. Committee selection must therefore be completed before the degree plan is filed.

Committee meetings: All graduate students are required to have at least one committee meeting each year. A "Thesis Committee Annual Report" form must be submitted to the Genetics Graduate Program Office no later than July of each year. You will find this form in the beginning of the "Appendix VI" section of this handbook. **Failure to do so may result in a registration block for the fall semester.**

Annual Progress Report: All graduate students are required to fill out an electronic annual progress report that describes information on publications, meetings, and presentations in which you have participated.

Degree Plan: The Degree Plan establishes course work and research hours to be completed by a student during graduate study. The courses, which constitute the degree plan, are decided upon by the student in consultation with the Major Professor and Thesis Committee. The minimum total number of hours required on a Ph.D. degree plan is 64 for students entering with a M.S. degree awarded in the U.S. (or its equivalent as determined by the Office of International Admissions). Students entering without a M.S. degree or with an M.S. degree that is not the equivalent of one awarded in the U.S. should have 96 hours on their degree plan. Course requirements are listed in Appendix III of this handbook.

Limitations on the use of undergraduate, seminar, and transfer courses are detailed in the Graduate catalog. The degree plan is filed through an on-line submission process, signed

electronically by all members of the Thesis Committee, and submitted to the Chair of the Faculty of Genetics for Department Head signature. Student must file a degree plan by the end of their third full semester. **Students failing to meet these deadlines will be blocked from registration.**

Proposal: The proposal describes the research that a student intends to undertake. The Proposal provides a student with the opportunity to plan his/her graduate research project and to become familiar with the literature in that area. Proposals serve to launch a student into a research project, and are thus only effective if completed early in the graduate career. For this reason, proposals should be completed and submitted prior to the end of the fifth full semester. In the proposal, the student describes the rationale for the research project, the objectives of the research to be performed, and outlines the techniques to be used. Proposals must include a standard cover sheet available from the OGAPS website. The proposal is evaluated by the student's Thesis Committee, signed by all members, and submitted with the cover sheet to the Chair of the Faculty of Genetics for Department Head signature. Proposals that include research with vertebrate animals (including antibody generation in rabbits or mice) must enclose a copy of an approved Animal Use Protocol cover page. The proposal is not a contract to perform the described research, and significant research progress need not be completed at the time of proposal submission. It is instead a mechanism to assist students in clarifying research goals early in their graduate program, to encourage students to become familiar with the primary literature in their field, to provide students with experience in technical writing, and facilitate research interactions between students and members of their Thesis Committee.

Preliminary Examination: The preliminary examination includes a written proposal, a written exam, and an oral examination in which a Ph.D. student's mastery of his or her field of specialization is tested by the student's Thesis Committee. Students should schedule their preliminary examinations before the end of their fifth full semester of graduate study. You must have current cumulative and degree plan GPR's of AT LEAST 3.00 to be eligible for the exam.

The exam is given no earlier than a date when you are within approximately six credit hours of completion of the formal course work (i.e., all course work on the degree plan except 681, 684, 690, 691, and 692 courses) or no later than the semester following the completion of the formal course work on the degree plan. The preliminary examination checklist can be found on the OGAPS website.

The written proposal must be given to the student's Thesis Committee no later than 2 weeks prior to the oral exam. The student is responsible for scheduling written exams with each member of their Thesis Committee. Individual members of the Thesis Committee may elect to waive their written exam.

Once all portions of the examination are completed, the Major Professor will report the results of the examination in writing using the proper form within ten working days of the scheduled examination date to OGAPS. Note that this form requires the signatures of all Thesis Committee members. Upon receiving the form OGAPS will verify that all eligibility requirements were met and, if so, record the results of the preliminary exam. If post-review of the exam by OGAPS reveals that eligibility requirements were not met, then the student and the Major Professor will be notified of necessary actions (such as repeating the exam) required to rectify any deficiencies. Upon acceptance of a passing preliminary exam by OGAPS, you will be considered a candidate for the PhD degree (advanced to candidacy). **After passing the required preliminary examination, the student must complete all remaining requirements for the degree within four calendar years. Otherwise, you must repeat the examination.**

If the student fails the preliminary examination, there is no obligation for a re-examination. At their discretion, the Thesis Committee (with no more than one member dissenting) may allow one re-examination when adequate time has passed to allow you to address inadequacies emerging from the first examination (normally six months).

Eligibility Requirements that Cannot be Waived:

1. You must be registered for the semester during which you plan to take either the preliminary or the final examination (or in which any portion of the exam may fall).

2. You must have an approved degree plan on file with OGAPS.

3. You must have cumulative GPR of 3.00 or above.

4. You must have a degree plan GPR of 3.00 or above.

5. You must have satisfied English language proficiency requirements (non-native English speakers).

6. You must have given your Thesis Committee a copy of your written proposal no later than 2 weeks prior to the oral exam.

7. All committee members must have scheduled or waived the written portion and agreed to attend the oral portion of the exam or have found a substitute. Only one substitute is allowed and it cannot be the Major Professor.

Dissertation: Graduate study culminates in the dissertation, which describes a student's research and outlines the unique contribution a student has made to expand the frontiers of knowledge. The dissertation describes the research undertaken by a student during graduate study. It is approved by the student's Thesis Committee. The format of the dissertation is very precisely controlled by OGAPS. Students must refer to the Thesis Manual and follow it exactly, or risk having their manuscript rejected by the Thesis Clerk. The Thesis Manual is available at the OGAPS website. The content of the dissertation is established by the student in consultation with the Thesis committee. The dissertation should be submitted to the student's Thesis Committee at least two weeks prior to the Final Defense. It is important that you NOT WAIT until the last minute to take care of this.

Publications: In publications authored by a graduate student in the Genetics Interdisciplinary Program, the students affiliation should be listed as the "Graduate Program in Genetics." If desired, the student's home department can be listed as an additional affiliation.

Final Defense: The final defense provides the student's Thesis Committee with the opportunity to evaluate a student's understanding of his or her research. The final defense consists of a formal public seminar of results presented by the student announced two weeks in

advance. The presentation is followed by an oral examination of the candidate by the Thesis Committee. Final changes to the Dissertation are discussed at this time. The final defense must be held within four years of advancement to candidacy. For all students, the defense should be scheduled at least four weeks prior to the OGAPS deadline for submission of manuscripts to the Thesis Clerk. This will allow adequate time for revisions and two weeks for the Chair of the Faculty of Genetics signature.

REQUIREMENTS FOR THE PHD DEGREE

Peer-Reviewed Publication Requirement: Students are required to have at least one first-author peer-reviewed publication accepted before scheduling the Final Defense. The Doctor of Philosophy degree is awarded based upon the generation of new knowledge, which in the field of genetics is demonstrated by publication in the peer-reviewed literature. If a paper is under revision, an exception to schedule the Final Defense can be requested from the Chair of the Faculty of Genetics.

MINIMUM CREDIT HOURS

All students must remain in continuous enrollment throughout their graduate careers. This means that you must enroll for at least one credit hour during every regular semester (Fall and Spring) while you are working towards your degree. Continuous enrollment is required regardless of a student's source of support. All students using university facilities are required to enroll for a minimum of one credit hour.

SPRING AND FALL: All graduate students receiving Assistantships are required to register for a minimum of 9 hours during the Fall and Spring semesters throughout your graduate career.

SUMMER: All graduate students receiving Assistantships are required to enroll for a minimum of 6 semester credit hours during the summer. The requirement is 3 semester credit hours during any one Summer session in which you are enrolled or 6 semester credit hours during two Summer sessions in which you are employed.

If you are unsure about the GENE 691 (research) section in which you should register (for any semester), please contact the Genetics office at 979-458-2284. For the summer session, the maximum number of GENE 691 hours in each 5-week term is 6, and in each ten week term is 10. So, in order to register for twelve hours, you may register for two 6 hour, 5-week terms.

FULL-TIME STATUS: Graduate students receiving Assistantships are considered full-time students if registered for a minimum of 9 semester credit hours during a fall or spring semester, 6 semester credit hours during a 10-week semester, or 3 semester credit hours during a 5-week term. The Genetics program is exempt from the 100 credit hour cap.

Mimimum GPR: OGAPS calculates two GPRs: a Graduate GPR comprising all courses taken and a Degree Plan GPR comprising just courses on your degree plan. It is expected that both a student's Graduate GPR and Degree Plan GPR will remain at or above 3.00 during his or her graduate career. When the GPR drops below 3.00, a student will be given a one semester probationary period to bring it back to 3.00. If this is not achieved, the student must meet with the Major Professor to determine whether the student should remain in the Genetics Graduate Program. If the student has not chosen a Major Professor at this point, the Chair of the Faculty of Genetics will consider scholastic probation (see below) based on evaluations from "rotation" professors and grades at that point. A student will not be allowed to take the Preliminary Exam, advance to candidacy or give the Final Defense if either GPR is below 3.00.

Scholastic Probation: A conditional permission for a student to continue in the degree program can be given after the student has become scholastically deficient. For Genetics graduate students, this permission is granted by the Chair of the Faculty of Genetics. The record made by a student while on probation determines whether he or she shall be cleared to register as a regular student, be granted a continuation on probation or be suspended, dismissed or terminated from the university for scholastic deficiency. The graduate student may be informed in writing of the terms of probation and may be required by the Major Professor or in

consultation with the Chair of the Graduate Advisory Committee or the Chair of the Faculty of Genetics to register for a prescribed schedule of courses. Hour and GPR requirements shall be made consistent with the student's progress toward graduation. The specified hours and grade points are considered to be a minimum only. In addition to, or in lieu of, course work, a graduate student may be required to demonstrate progress toward completion of the degree by completing specified examinations and/or specified milestones in research or other independent study leading to completion of the dissertation. A graduate student will remain on probation until the terms of the probation are accomplished and the Graduate Advisory Committee and Chair of the Faculty of Genetics recommends that the probation be lifted. A graduate student blocked or suspended for deficient scholarship may appeal such a decision through the Graduate Appeals Panel, following the procedures defined on the OGAPS website.

Teaching Requirement: All students are required to participate as a Teaching Assistant (TA) for two semesters, typically during the second and third semesters. All students regardless of source of funding must complete this requirement, as it is an important aspect of professional training. Previous teaching experience at the University level can be used to fulfill this requirement, at the discretion of the Chair of the Faculty of Genetics. Students with this type of experience should submit a written description of the course(s) they taught, what duties were required, and the name and telephone number of the faculty member in charge of the course.

All incoming graduate students must complete TA training. Texas A&M University provides a mandatory TA training called Teaching Assistant Training and Evaluation Program ("TATEP"). All new graduate students will be registered during orientation and must attend. Additionally, Genetics TA's must register for one credit of GENE 697 (Teaching Genetics Labs) every semester they TA.

Department Assignment: When hired as a teaching assistant or when offered a Regents fellowship through the Faculty of Genetics, you will at this time be considered a Genetics major through the Department of Biochemistry and Biophysics. After completing your rotations and choosing a Major Professor, you will need to access the Petition form on the OGAPS web-site. At this point, you will complete the petition for change of department, keeping GENETICS as

your major, and changing your department to that of your Major Professor. Your Major Professor, the Chair of the Faculty of Genetics, and the Department Head of Biochemistry and Biophysics need to sign this document. You will submit a copy to the Genetics office and then submit the original and any required copies to OGAPS

Deadlines: Proposals and dissertations with Thesis Committee signatures must be submitted to your Faculty Advisor or Chair of the Faculty of Genetics for approval at least two weeks prior to the OGAPS submission deadline. It is important not to wait until the last possible minute to take care of this – consider that faculty members may be out-of-town of unavailable, and these are extremely important documents that are required for your career to progress.

FINANCIAL SUPPORT

Formally, there are three forms of support for graduate students in our program: Graduate Assistant Teaching (GAT), Graduate Assistant Non-Teaching (GANT), Graduate Assistant Research (GAR) and Fellowships. GAT and GANT support is provided by from state-appropriated teaching funds. GAR support is provided by individual faculty and is funded by research grants. Fellowship support may be provided by the University, Federal or other sources and is awarded on a competitive basis.

In order to receive support, students must register for a minimum of 9 credit hours for the fall and spring semesters. For summer support, registration in a minimum of 3 credit hours per five-week summer session, or 6 credit hours for the 10-week session is required.

APPENDIX I

Expectations of Genetics Graduate Students

At all times, before and after passing the preliminary exam, a student must remain in good standing to continue in the graduate program. Graduate students are expected to:

1. Make reasonable progress in their research. Graduate students are expected to actively work on their research project unless they notify their advisor and officially take vacation, medical, or family leave.

- When students are not actively engaged in running experiments or analyzing data, they should be reading the literature or drafting or editing papers, abstracts, reviews or proposals.
- Sometimes projects don't work as expected, resulting in unpublishable data. Students are expected to work with their advisor and Thesis Committee to assess the risk of their projects. Risk can be actively managed many ways, including by planning experiments to determine as rapidly as possible whether or not a new project is viable, by setting performance deadlines (if we haven't solved the problem by this date, we need to change approaches), or by developing alternate, less risky "Plan B" projects in parallel with the risky project.

Timeline for research deadlines:

Year	Semester	Task
1	Fall	Rotations + selection of major professor
	Spring	Join research lab (4th rotation may be required)
		Select a Thesis Committee by end of the spring semester
	Summer	Thesis Committee must meet by end of the summer semester
		Student should present a draft degree plan to their committee.
		The degree plan must be submitted AND approved by the committee by the end of summer.
2	Summer	Prelim must be scheduled by end of July
		Thesis Committee must meet by end of the summer semester
3	Fall	Preliminary Exam must be completed by the end of fall semester[1]
	Summer	Thesis Committee must meet by end of the summer semester
4 +	Summer	Thesis Committee must meet by end of the summer semester
5	Summer	Thesis Defense[2]

[1] If necessary, a student may submit a request for additional time to complete their preliminary exam in writing to the Genetics Postdoctoral Administrator and the Chair of the 1st Year Student Thesis Committee. This request must be approved by 3/4 majority vote of the 1st Year Student Thesis Committee.

[2] OGAPS Rule: The defense must occur within 4 years after the preliminary exam (end of fall semester of 7th year) or the preliminary exam must be repeated.

It is expected that all students will adhere to this schedule. Students who do not meet deadlines will be contacted by the Chair of the Faculty of Genetics to insure that adequate progress is being

made. In most cases, a letter from the student's major professor to the Chair of the Faculty of Genetics, explaining why the schedule was not met, will be sufficient for continuation. **If students experience recurring problems in meeting the schedule, registration may be blocked.** In these cases, the Chair of the Faculty of Genetics and the student's major professor will meet.

2. Provide access to all data and procedures. According to the Texas A&M Administrative Procedure
15.99.03.M1.03 http://rules-saps.tamu.edu/PDFs/15.99.03.M1.03.pdf "research data conducted on a Texas A&M University project" belongs to Texas A&M University. This includes, but is not limited to:

- Research notebooks and electronic files need to be clear and complete, and the PI and other lab members need to have access to this information.
- All data needs to be permanently and safely stored in the laboratory at all times. For instance, data cannot be stored only in one place (e.g., on a student's personal computer) and then removed from the laboratory.
- Data collected by a Genetics Graduate Student at other institutions needs to be added to the lab paper or electronic files upon return to Texas A&M University.

3. Behave professionally and respectfully to their colleagues. A student's success in graduate school depends, in part, on the help and support (e.g., training and protocols, critical evaluation of data, troubleshooting assistance) provided by their PI, lab mates, and other colleagues. Students are expected to behave professionally and respectfully toward their colleagues at all times. Behaviors that foster a hostile workplace are not only forbidden by university policy, but they also erode the social network that helps students succeed.

4. Comply with university policies. In addition to specific policies mentioned above, these policies include but are not limited to:

- The TAMU Student Conduct Code http://student-rules.tamu.edu/rule24.
- Compliance with all regulatory policies applicable to the student's research, and completing the required training courses in a timely manner.

- TAMU rules, policies and Standard Administrative Procedures are available at http://rules-saps.tamu.edu/TAMURulesAndSAPs.aspx.

Dissolving a student/PI relationship

We understand that conflicts can arise between students and faculty, and the Genetics Student Advisory Committee will work with a student in good standing to resolve these conflicts or help the student change laboratories. In the best interest of the student, we will not support multiple lab changes.

A student and/or a PI may decide to dissolve their relationship. The procedure in cases such as these follows:

The student or PI terminating the relationship should first contact at least one of the following people:

- The Genetics Administrator
- The Chair of the Genetics Student Advisory Committee
- The Chair of the Faculty of Genetics

The student and their Major Professor should then meet to discuss the situation. If needed, members of the Genetics Student Advisory Committee may either advise the instigator prior to this discussion or participate in this discussion.

The Program encourages students to make a thoughtful decision about their permanent lab and put sincere effort into their project, since leaving a lab has the potential to be detrimental to the student's career. There are four possible outcomes from terminating a student/PI relationship: (i) the student may join another lab and still pursue a Ph.D., (ii) the student may graduate with a coursework master's degree, (iii) the student may graduate with a thesis master's degree, or (iv) the student may leave the university without a degree.

(i) If the student is in good standing and wants to pursue a degree in another lab, then the student should immediately begin actively seeking another research mentor. Faculty in the program are listed on the Genetics website at http://genetics.tamu.edu/faculty. Members of the Genetics Student Advisory Committee or the Chair, the Genetics program, or the Genetics Administrative Postdoc may know of labs actively seeking new members. Students are responsible for contacting faculty and arranging interviews if the faculty is considering taking new students.

Often the student is unpaid during this transition.

- Some faculty may be able to provide salary support while the student finishes ongoing experiments and organizes data, and the student may seek a new lab during this time. *However, this is unusual, and a student should not depend on this support being available.*
- In rare cases a student may TA to support their salary while they seek a new lab. TA positions are generally only available just before the spring and fall semesters begin. In general, TAships are awarded first to students in that department, then to students in Interdisciplinary Programs like Genetics who are members of labs, and then finally to students changing labs.
- The Genetics program does not have funds available to support the salary of students during this transition period.

Consequently, it is important to find a new lab as quickly as possible, keeping in mind that it is vital that the lab be a good match for the research interests and personality of the student. The student must find a new research lab by the end of that semester. The Genetics Program does not have funds to pay the tuition and fees for the next semester for students transitioning between laboratories.

(ii) If the student wants to leave TAMU with a coursework (Non-thesis option) master degree, then he or she needs to fill out a Degree Change form through https://ogsdpss.tamu.edu/. Then, new committee selected with the assistance of the Genetics Administrative Office. A new degree plan is required using forms available at the Document Processing Submission System website (https://ogsdpss.tamu.edu/). To get a NTO master's degree, students must have accumulated 36 hours of coursework. If the student has passed his/her prelim, then he/she have

probably accumulated enough coursework hours. The student must apply for a degree change as soon as possible given that the University deadlines are very early, soon after the semester begins. Deadlines can be found at http://registrar.tamu.edu/Catalogs,-Policies-Procedures/Academic-Calendar. If the deadline for the current semester has already passed, the student can apply for a degree to be awarded the following semester. A detailed list of steps for graduating with a master's degree, including links all the required forms, can be found at http://ogaps.tamu.edu/New-Current-Students/Getting-a-Degree/Master-s-Degree-Requirements. Please note that there are fees associated with graduation.

(iii) The student may elect to graduate with a thesis master's degree. In addition to accumulating 32 hours of coursework, a thesis master's degree candidate must write and defend a master's thesis. To write a thesis, the student must have accumulated enough data to generate a compelling, well-supported story. Generally the students previous PhD committee will continue to serve as the master's thesis committee. Thesis masters students must submit to OGAPS a Proposal Approval Form no less than 20 days prior to their defense. The student's degree plan must also have been approved no less than 90 days before their Master's Thesis defense. Consequently, it is important to quickly complete both of these forms.

(iv) If a student decides to leave the university without a degree. They need to make sure that the Genetics Administration Postdoc has been notified of their decision.

In all cases, when departing a lab for any reason, students need to remember to make available all notebooks, electronic records, and data to the laboratory and PI. The student must also make sure all products created by the student (e.g., animal lines, DNAs, proteins, chemicals) are clearly labeled and the remaining lab members know their location. All research notes, data, records, and products are owned by the University.

Involuntary Termination from the Genetics Graduate Program

Students can be involuntarily dismissed from the Genetics Graduate Program for a number of reasons, including but not limited to:

1) Failure to remain a student in good standing.

2) Failure to meet Expectations for Genetics Graduate Students (see above).

3) Students must be actively making progress toward their degree. If they leave their original lab, they must find a new lab by the next registration deadline, so they can register for GENE 691 if the student feels like this could be a problem, they should either contact the Chair of the Genetics Advisory Committee or the Administrative Postdoc as soon as possible.

4) An unsatisfactory grade from the student's PI.

5) Other events not explicitly covered that call into question a student's ability to complete the necessary work for a PhD degree.

6) Other events not explicitly covered that call into question the student's ability to interact with their colleagues in a respectful and professional manner.

If any of these situations should occur, the student's case will be reviewed by the Genetics Advisory Committee, who can vote for termination of the student from the program with a 3/4 majority.

APPENDIX II

Expectations of Genetics Faculty

Members of the Faculty of Genetics are expected to support the program by participation in at least a subset of the following activities:

1. Attending Genetics Seminars
2. Hosting a speaker for the Genetics Seminar
3. Participation in one of the program committees, a list of which can be found at
   http://genetics.tamu.edu/faculty/committees
4. Participation in social events organized by the GGSA.
5. Mentoring a Genetics Graduate Student. Remember that faculty that accept a Genetics graduate student into their lab must first sign the Expectations for Graduate Training and Support form on the next page.
6. Teaching a graduate level GENE course
7. Participating in Genetics student recruitment

Faculty of Genetics – 2017 Expectations for Graduate Student Training and Support

The Genetics IDP is a premiere graduate program that recruits the most talented high potential graduate students in life sciences at TAMU. The program has the following expectations of all faculty members accepting new Genetics PhD students into their laboratories:

1. The faculty member will honor the fact that the student was recruited by the efforts and funds of the Genetics IDP, and is student in the Genetics IDP. Consequently, the faculty member will refrain from encouraging or advising the student to transfer to any other TAMU sponsored graduate program for any purpose.

2. The faculty member will make the best effort to support the new student's salary until at least August 31, 2022, starting June 30th, 2018 at a level equal to or higher than the current stipend stipulated in the student acceptance letter for the Genetics IDPG ($26,000/year).

3. The faculty member will cover the full cost of tuition and fees (including those for summer semesters) for the student beginning with the summer semester of 2018 until the student graduates.

4. The student may earn a stipend by accepting teaching assistant assignments, if available, in addition to the two semester teaching requirement of the program (second semester, while being paid by the program, and third semester, paid by the PI). However, the program strongly discourages teaching assistant assignments in excess of 2 semesters during year 2 to 5, to ensure that students are able to complete their research project in a timely manner.

5. If a student is given a teaching assistantship, the faculty member will make the best effort to supplement the teaching assistantship to ensure the student's salary does not drop below $26,000/year.

6. Breaking any part of this agreement may preclude the faculty member from taking Genetics students into their laboratory in the future.

Faculty name _____

Faculty signature _____ Date: _____

APPENDIX III
COURSE REQUIREMENTS FOR the PhD DEGREE in GENETICS

Required Courses (17 CR)

- GENE 603 Genetics (4 CR)
- GENE 608 Model Genetic Systems (2 CR)
- Computational genetics (3 CR)**

  CSCE 601 Programming with C and Java

  BIOL 651 Bioinformatics

  STAT 604 Special Problems in Statistics Computations and Analysis

  STAT 646 Statistical Bioinformatics

  STAT 657 Advanced Programming using SAS

  VIBS 613 Evolutionary Bioinformatics

  GENE 689 Command Line Skills
- GENE 681 Seminar (2 CR)
- GENE 682 Seminar Presentation (2 CR)
- GENE 685 Research Rotations (1 CR)
- GENE 697 Teaching Genetics Labs (1 CR)
- Research ethics (1 CR) options:
  - • BICH 689, Section 601 Application of Scientific Values in Daily Research Practice

Elective Courses (9 CR, spread across at least three competency areas*)

- Molecular genetics
  - BIOL 601 Biological Clocks
  - BIOL 635 Plant Molecular Biology
  - GENE 626 Analysis of Gene Expression
  - GENE 631 Biochemical Genetics
  - GENE 648 Molecular Evolution
  - GENE 662 Eukaryotic Transcription
  - GENE 673 Gene Expression
- Quantitative and population genetics
  - ANSC 628 Animal Breeding
  - • ANSC 689 Advanced Quantitative Genetics
  - EEBL 605 Population and Quantitative Genetics
  - EEBL 606 Phylogenetics and Comparative Biology
  - • ESSM 689 Quantitative Methods in Ecology, Evolution and Biogeography
  - GENE 606 Quantitative Phylogenetics
  - GENE 612 Population Genetics
  - GENE 613 Quantitative Genetics
  - GENE 614 Maximum Likelihood Estimation of Genetic Parameters
  - GENE 638 Prediction of Genetic Merit
  - GENE 643 Quantitative Genetics and Plant Breeding
  - SCSC 641 Plant Breeding
  - SCSC 642 Plant Breeding II
  - WFSC 624 Dynamics of Populations
- Statistics and bioinformatics
  - CSCE 601Programming with C and Java
  - BIOL 651 Bioinformatics
  - • GENE 689 Command Line Skills
  - GENE 689 Metagenomics

STAT 604 Special Problems in Statistics Computations and Analysis

STAT 643 Biostatistics I

STAT 644 Biostatistics II

STAT 646 Statistical Bioinformatics

STAT 651 Statistics in Research I

STAT 652 Statistics in Research II

STAT 657 Advanced Programming using SAS

VIBS 613 Evolutionary Bioinformatics

WFSC 670 Excel Biometry

- Organismal genetics

ANSC 624 Mammalian Developmental Genetics

BIOL 601 Biological Clocks

BIOL 606 Microbial Genetics

BIOL 610 Evolution

BIOL 611 Developmental Genetics

BIOL 652 Epigenetic Mechanisms

BIOL 698 Behavior, Genes, Evolution

GENE 633 Conservation Genetics

GENE 677 Genes and Diseases

MARB 668 Evolutionary Biology

MSCI 630 Pathogenesis of Human Disease

- Genomics

BIOL 650 Genomics

EEBL 607 Evolutionary Genomics

GENE 620 Cytogenetics

GENE 629 Applied Animal Genomics

GENE 654 Analysis of Complex Genomes

GENE 655 Analysis of Complex Genomes-Lab

• GENE 689/BIOL 689 Bacterial Genomics

VTPP 638 Analysis of Genomics Signals

VTMI 664 Mammalian Genome Modification for Biomedical Research

• Courses with the number 689 are ‘special topics’. Many of these are held regularly but have not yet received a course number.

**Approved courses meeting requirements. Alternative courses must be approved by the Genetics Curriculum Committee.

Typical Curriculum*

1st Year

Fall (9 CR)
GENE 603 (4 CR) Genetics
GENE 608 (2 CR) Model Genetics Systems
GENE 681 (1 CR) Seminar
GENE 685 (1 CR) Research Rotations
BICH 689-601 (1 CR) Ethics

Spring (9 CR)
Computational genetics (3 CR)
Genetics elective (3 CR)
GENE 681 (1 CR) Seminar
GENE 697 (1 CR) Teaching Genetics Labs
GENE 691 (1 CR) Research

Summer (6 CR)
GENE 691 (6 CR) Research
Submit Degree Plan

2nd Year

Fall (9 CR)
Genetics elective (3 CR)
Genetics elective (3 CR)
GENE 691 (3 CR) Research

Spring (9 CR)
GENE 682 (1 CR) Seminar Presentation (15 min presentation)
GENE 691 (8 CR) Research

Summer (6 CR)
GENE 691 (6 CR) Research

3rd Year

Fall (9 CR)
GENE 691 (9 CR) Research
Preliminary Exam

Spring (9 CR)
GENE 691 (9 CR) Research

Summer (6 CR)
GENE 691 (6 CR) Research

4th Year
Fall (9 CR)
GENE 682 (1 CR) Seminar Presentation (25 min presentation or defense)
GENE 691 (8 CR) Research

5th Year
Fall/spring as needed
GENE 682 (1 CR) Seminar Presentation (defense)
GENE 691 (8 CR) Research
Thesis Defense

Total hours for PhD

96 CR plus completion of dissertation
64 CR plus completion of dissertation if previously completed MS degree

***** Additional elective courses may be taken. 9 credit hours of genetics electives are required.

APPENDIX IV

Procedure for Approving New GENE Electives

The revision of the GENE PhD curriculum around competency areas provides substantial flexibility for individual degree programs. Students are required to have 9 CR of electives spread across three of the four competency areas (Molecular Genetics, Quantitative and Population Genetics, Organismal Genetics, and Genomics and Bioinformatics). All courses should have a substantial research literature component. Courses meeting the criteria can be added to the list of qualified courses. The process is:

1) A GENE faculty member nominates a course that fulfills a specific competency area to the Chair of the Curriculum Committee.
2) The nomination should include the syllabus and a justification for how the course fulfills a specific competency area.
3) The justification and syllabus will be forwarded to members of the Curriculum Committee, who will have 10 working days to vote for or against inclusion of the nominated course in the GENE curriculum. Any member can also request tabling the request for discussion at a Curriculum Committee meeting that should occur within 30 days of the request to table.
4) A simple majority vote of the Curriculum Committee is required to recommend the course to the GENE Executive Committee for inclusion in the GENE curriculum.
5) For courses not approved, the nominating GENE faculty member may request a meeting of the Curriculum Committee to present the course for open discussion, which will be followed by another vote by the Curriculum Committee.
6) The GENE Executive Committee will vote for or against inclusion of courses recommended by the Curriculum Committee in the GENE curriculum within 10 working days of receiving the recommendation. A simple majority is required to approve the course.

APPENDIX V

Lab Rotations Schedule

SCHEDULE OF LAB ROTATIONS

2017-2018

1st Rotation

Choices due:	Thursday, August 31, 2017
Rotations begin:	Monday, September 4, 2017
Rotations end:	Friday, October 6, 2017

2nd Rotation

Choices due:	Thursday, October 5, 2017
Rotations begin:	Monday, October 9, 2017
Rotations end:	Friday, November 10, 2017

3rd Rotation

Choices due:	Thursday, November 9, 2017
Rotations begin:	Monday, November 13, 2017
Rotations end:	Friday, December 15, 2017

Major Professor Selection

Final lab preferences should be turned in by Tuesday, December 19, 2017
Student enters new lab on Tuesday, January 2, 2018

4th Rotation (optional)

Choices due:	Thursday, December 21, 2017
Rotations begin:	Tuesday, January 2, 2018
Rotations end:	Friday, February 2, 2018

As of June 1, students will be on the payroll of the professor whose lab they have chosen to join for their thesis research work.

Students on rotations will follow the Employee Holiday Schedule*

Thanksgiving	Nov. 23 and 24	2 days
Winter Break	Dec. 25 thru Jan. 1	6 days
MLK, Jr. Day	Jan. 15	1 day
Spring Break	Mar. 14-16	3 days
Memorial Day	May 28	1 day

These dates are subject to change and approval of the TAMU Board of Reagents.

Lab Rotations in the Genetics IDP
Instructions for 2017

As an integral part of the process of selecting a research advisor, you will undertake three laboratory rotation periods in your first semester. For students whose interests are not yet focused, the rotations offer exposure to different fields of genetics. They also allow you to experience the research environment of a specific laboratory before making a commitment to do doctoral research in that laboratory.

How to choose a laboratory
The first consideration in choosing a laboratory should be the scientific activities in the particular laboratory, but it is also important to inquire about the future availability of laboratory space and **stipend support**. To get an idea of the research activities in each laboratory, it is important to attend the Genetics Faculty talks.

Once you begin a laboratory rotation
During your laboratory rotations, please exert every effort to see if the environment in the laboratory, including interactions with the professor and with other research personnel, is desirable for your doctoral work.

Grading
The faculty will submit written reports of your laboratory rotations to the Genetics Graduate Student Advisory Committee. (see Rotation Student Evaluation – Faculty Response Form). These reports are based on such elements as time commitment, enthusiasm, perseverance, and interactions with laboratory personnel, and are considered by faculty in determining whether a student will be invited to join the laboratory. Because the Ph.D. is primarily a research degree, productive and interactive lab rotations are extremely important in setting the course of your career as a research scientist. Students are also given an opportunity to evaluate the rotation laboratory and PI (see Rotation Faculty Evaluation – Student Response Form).

Duration
Each laboratory rotation period is approximately 5 working weeks, with the first beginning at the start of the fall semester. The exact dates are indicated on the attached *Schedule of Lab Rotations* as in the *Graduate Student Handbook*.

Procedure for submitting preference lists
During the first week of the fall semester, and again about one week before the beginning of the second, and third laboratory rotation periods each student must submit a written preference list of four faculty names. These forms should be submitted to Dr. Carol Vargas (Bio/Bio Rm109A) (genesec@tamu.edu).

Requirements: The steps for submitting the first laboratory rotation preference list are given below and MUST be followed.
1. Attend the Faculty Research Talks during new student orientation week and at additional scheduled times (if appropriate).

The Faculty Research Talks are a great opportunity for you to learn more about the different research opportunities available in the department and to make a wise decision about lab rotations.

2. Set up meetings with *at least* five faculty members to discuss completing a laboratory rotation in their laboratory during the fall semester.
Begin to set up these meetings as soon as possible. Immediately after the faculty member has given his/her "faculty research talk" is a good time. Remember, if you wait too long, the faculty may not have the time to meet with you before your preference list is due.

3. Meet privately with the faculty members.
Failure to meet with the faculty members delays the laboratory rotation assignment process, not only for yourself, but also for your classmates as well. The graduate academic advisor calls the faculty members on your list to verify that you have actually met with them.

4. Have each of the five faculty members with whom you meet sign a *Faculty Confirmation* form (included in your orientation packet)
When a faculty member signs the *Faculty Confirmation* form, it does NOT commit him/her to taking you into his/her laboratory for a laboratory rotation. It simply states that you met with the faculty member to discuss completing a laboratory rotation in the laboratory.

5. Submit your *Preference List* of three faculty names (no less) in RANKED ORDER for the FIRST ROTATION, along with *Faculty Confirmation* forms to Dr. Carol Vargas (109A BioBio) or genesec@tamu.edu.
The deadline for submitting your first rotation preference list is 5 pm., Thursday, August 31, 2016.
Your *Preference List* must be submitted by the deadline. **NO EXCEPTIONS. NO EXCUSES**.
The *Preference List* forms are included in the handbook, in your orientation package, and extra forms are available from Dr. Vargas.

The Genetics Student Advisory Committee will assign rotations according to the preference lists insofar as possible, subject to the approval of the faculty involved. A laboratory assignment list will be distributed by email before the rotation begins.

6. A new Preference List with the names of *three* faculty members in RANKED ORDER is to be submitted before the **second rotation on October 5, 2017**, and again before the **third rotation on November 9, 2017.**

7. Before the second and third rotations, you are strongly encouraged to meet with additional faculty members to discuss rotation opportunities in those laboratories. It is very likely that the initial list of preferences you submitted before the first rotation will change, as you learn more about the program and more about research opportunities at Texas A&M.

APPENDIX V

ADDITIONAL FORMS

Annual Committee Report

Preliminary Exam Information – see OGAPS website:

http://ogaps.tamu.edu/Buttons/Forms-Information

Genetics Faculty Confirmation Form

Lab Rotation Preference Forms

Lab Selection Preference Form

Faculty Rotation Evaluations

Student Rotation Evaluations

***OGAPS Forms are available on-line at:**

http://ogaps.tamu.edu/Buttons/Forms-Information

Additional forms unique to the genetics program are provided in this section.

Ph.D. Thesis Committee Annual Report
Program of Genetics
TEXAS A&M UNIVERSITY

Student: _____ Date Entered the Ph.D. Program _____

Meeting Date _____ Previous Meeting Date _____

Prelim Date (if applicable) _____

Committee Chair _____ Co-Chair _____
(if applicable)

Name of Reporting Committee Member _____

Journal Club(s) in which student regularly participates:

Summarize your specific recommendations to student:

Assess student's overall progress toward completion of the Ph.D. degree (circle):

Excellent Satisfactory Borderline Unsatisfactory

Additional comments:

The Chair of the Committee will collect completed forms at the time of the meeting and copies will be provided to members of the committee, the student, and the Graduate Programs Office of Genetics. Note: Failure to file an Annual Report with the Graduate Programs office will result in a block of registration.

GENETICS FACULTY CONFIRMATION

LAB ROTATION 2017

_____ has met with me to discuss completing a laboratory rotation in my lab.

_____

Signature of Faculty Member

GENETICS FACULTY CONFIRMATION

LAB ROTATION 2017

_____ has met with me to discuss completing a laboratory rotation in my lab.

_____

Signature of Faculty Member

PREFERENCE LIST FOR FIRST LAB ROTATION

These are choices for the first lab rotation, NOT for all three rotations. A new preference list must be submitted before each rotation.

Students are strongly encouraged to talk to more than one professor for each rotation in case the first or second choice cannot be arranged.

The rotation preference list is to be turned in to the Gene Administrator (109A Bio/Bio or MS 2128). Lab rotation assignments are made in consultation with Principle Investigators.

Student Name: _____

Lab Choice for Third Rotation

1. _____
2. _____
3. _____

Any additional information that would help with rotation assignments:

Student signature:_____

PREFERENCE LIST FOR SECOND LAB ROTATION

These are choices for the first lab rotation, NOT for all three rotations. A new preference list must be submitted before each rotation.

Students are strongly encouraged to talk to more than one professor for each rotation in case the first or second choice cannot be arranged.

The rotation preference list is to be turned in to the Gene Administrator (109A Bio/Bio or MS 2128). Lab rotation assignments are made in consultation with Principle Investigators.

Student Name: _____

Lab Choice for Third Rotation

4. _____

5. _____

6. _____

Any additional information that would help with rotation assignments:

Student signature:_____

PREFERENCE LIST FOR THIRD LAB ROTATION

These are choices for the first lab rotation, NOT for all three rotations. A new preference list must be submitted before each rotation.

Students are strongly encouraged to talk to more than one professor for each rotation in case the first or second choice cannot be arranged.

The rotation preference list is to be turned in to the Gene Administrator (109A Bio/Bio or MS 2128). Lab rotation assignments are made in consultation with Principle Investigators.

Student Name: _____

Lab Choice for Third Rotation

7. _____

8. _____

9. _____

Any additional information that would help with rotation assignments:

Student signature: _____

PREFERENCE LIST FOR LAB ASSIGNMENT

Student Name: _____

Ranked Choices for Lab Assignment

1. _____
2. _____
3. _____

Any additional information that would help with lab assignments (for instance, if you are similarly interested in two of the faculty):

Student signature: _____

Rotation Student Evaluation Faculty Response Score your response to each statement as follows: 1 poor; 2 fair; 3 average; 4 good; 5 excellent
1. The objectives of the project were clearly explained to the student.
2. The student appeared to have knowledge in this area.
3. The student was well prepared.
4. The student adequately answered questions proposed to him/her.
5. The student was able to discuss recent developments in the field
6. The student could apply concepts to demonstrate their understanding.
7. The student appeared to set high standards for himself/herself.
8. The student's understanding of the subject appears to have been increased during the rotation.
9. The student was informed of his/her progress
10. The student's progress in the lab seemed of a high priority for the student
11. I was satisfied with the student's accessibility within the lab.
12. I would recommend this student to one of my colleagues.

Student Name _____ Rotation Dates: _____

Grade for Rotation (A - F): _____

Would you consider taking this student into your lab for a thesis? Yes ___ No ___
(*This does not commit you to taking this student).* (please check one)

Advisor's Signature: _____

Advisor's Name (print): _____

(submit electronically to genesec@tamu.edu or by campus mail to Dr. Carol Vargas MS 2128)

Rotation Faculty Evaluation Student Response Score your response to each statement as follows: 1poor; 2 fair; 3 average; 4 good; 5 excellent
1. The objectives of the project were clearly explained to me.
2. I felt well prepared for this rotation.
3. The professor adequately answered questions I proposed to him/her.
4. The professor discussed recent developments in the field.
5. The instructor had students apply concepts to demonstrate understanding
6. The professor sets high standards for students.
7. My understanding of the subject appears to have been increased.
8. I was informed of my progress in the lab by the professor.
9. My progress in the lab seemed of a high priority to this professor.
10. I was satisfied with the professor's accessibility within the lab.
11. The professor increased my interest in this area.
12. I would recommend this professor to one of my friends for a rotation.

Faculty Name: _____ Rotation Dates: _____

Would you consider joining this professor's lab for a thesis? Yes ___ No ___
(*This does not commit you to joining this lab).* (please check one)

Student's Signature: _____

Student's Name (print): _____
(submit electronically to genesec@tamu.edu or by campus mail to Dr. Carol Vargas MS 2128)