

GRADUATE STUDENT HANDBOOK



Department of
Physiology and Developmental Biology

COLLEGE OF LIFE SCIENCES

BRIGHAM YOUNG UNIVERSITY

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I. ORGANIZATION OF DEPARTMENT

The Department of Physiology & Developmental Biology is one of seven departments in the College of Life Sciences. Within the department there are approximately 21 full-time faculty and staff members, 450 undergraduate majors, and 25 graduate students. Graduate degrees at the MS and Ph.D. level are offered in Physiology & Developmental Biology and Neuroscience. Graduate Faculty members are listed below:

A. PHYSIOLOGY & DEVELOPMENTAL BIOLOGY GRADUATE FACULTY

***Alder, Jonathan K.**, *Assistant Professor* (2014): BS, University of Utah, 2001; PhD Johns Hopkins University, 2007. My laboratory is interested broadly in how telomeres contribute to human health and disease. Telomeres are perhaps the best-characterized biologic clock and telomere shortening is a universal feature of aging. We currently focus on understanding how telomere dysfunction leads to lung disease. We use genetics, molecular biology, cell biology, and animal models and to investigate the mechanisms underlying telomere biology.

* **Arroyo, Juan A.**, *Assistant Professor* (2012): BS University of Puerto Rico 1991, Ph.D. Southern Illinois University School of Medicine, 2003. Molecular signaling of trophoblast cells apoptosis and the regulation of cell invasion during pregnancies complicated with Intrauterine Growth Restriction, Preterm Delivery and Preclampsia.

* **Barrow, Jeffery R.**, *Associate Professor* (2003): BS BYU 1990, Ph.D. University of Utah 1999. The major focus of the lab is to identify molecular mechanisms whereby the *Wnt* signaling pathway regulates the outgrowth of limbs and craniofacial structures during embryogenesis and how this pathway when aberrantly activated results in tumorigenesis.

* **Bikman, Benjamin T.**, *Assistant Professor* (2011): BS BYU 2003, Ph.D. East Carolina University 2008. Elucidate the molecular mechanisms that mediate the complications associated with obesity and metabolic diseases, with particular attention on lipid – and inflammation-induced insulin resistance.

Brown, Michael D., *Assistant Teaching Professor* (2003): BS BYU 1993, MS Colorado State University 1998, Ph.D. Colorado State University 1999. Regulation of axon and dendrite extension and pathfinding during nervous system development. Regeneration of the nervous system following injury. Regulation of the actin cytoskeleton during cell motility and division.

^* **Busath, David D.**, *Professor* (1995): BS University of Utah 1974, MD University of Utah 1978. Mechanisms of ion channel selectivity and gating; lipid-protein interaction; Influenza M2 channel structure, permeability, dynamics and block.

^* **Edwards, Jeffrey G.**, *Assistant Professor* (2007): BS BYU 1994, Ph.D. University of Utah 2003. Learning and Memory- Using electrophysiology in combination with pharmacology and molecular biology techniques, the lab is identifying mechanisms in the hippocampus mediating synaptic plasticity, the cellular event resulting in learning and memory formation. The goal is to understand normal function and as a result apply this to abnormal states such as epilepsy, addictions, and Alzheimer's.

***Hansen, Jason M.**, *Assistant Professor* (2014), BS, BYU, 1994; MS, BYU, 1996; PhD, University of Michigan, Ann Arbor, 2001. Cellular function is dependent upon numerous factors, including the balance of reducing and oxidizing equivalents or redox state. During periods of redox imbalance, cellular processes are perturbed, indicative of changes to cellular proliferation, differentiation and apoptosis. Our laboratory focuses on oxidative stress-related changes to cell signaling during embryonic development in efforts to better understand mechanisms of birth defects.

* **Hansen, Marc D.**, *Assistant Professor* (2005): BS BYU 1997, Ph.D. Stanford 2002. During development, cell junctions are assembled and disassembled to form tissues and organs. When control of this process is lost in cancers, metastasis results. Our goal is to understand the molecular basis of how cells control cell junction assembly and disassembly in developments and in cancer metastasis.

^***Hill, Jonathon T.**, *Assistant Professor* (2015). BS, BYU, 2005; PhD Columbia University, 2010. Congenital heart defects are the most common form of birth defects in the United States. In order to understand the mechanisms underlying these diseases, we are using interdisciplinary approaches combining the zebrafish animal model, molecular biology, genetics and bioinformatics to characterize the gene regulatory network driving heart differentiation and morphogenesis.

^* **Judd, Allan M.**, *Professor* (1991): BS BYU 1973, MS BYU 1978, Ph.D. West Virginia University, 1982. Interaction between the immune system, endocrine system, and nervous system. Effects of the immune system and immune system hormones upon the release of hormones from the adrenal cortex. Determination of the mechanism of cytokine stimulation and inhibition of adrenocortical function.

***Kooyman, David L.**, *Associate Professor* (1997): BS California State Polytechnic University, Pomona 1982, MS California State Polytechnic University, Pomona 1986, Ph.D. Ohio University, Athens 1993. Osteoarthritis as a multi-factoral disease involving inflammation, metabolic syndrome, primary cilia and mechanical stress. We use both transgenic and mechanical models to study this common disease, employing a number of techniques.

^* **Porter, James P.**, *Dean* (1998): BS BYU 1976, MS BYU 1978, Ph.D., University of California at San Francisco, 1982. Autonomic control of the cardiovascular system, focusing on the role hormones such as angiotensin II, insulin, and vasopressin play in modulating neural regulation of blood pressure. Research emphases are on how these hormones shape the development of neuronal circuits for cardiovascular control in young adults.

***Reynolds, Paul R.**, *Assistant Professor* (2007): BS BYU 1999, MS BYU 2001, Ph.D. University of Cincinnati and The Cincinnati Children's Research Hospital 2004. Developmental role of autocrine/paracrine signaling in the lung during branching morphogenesis; pulmonary remodeling induced by epithelial/mesenchymal interactions; mechanisms of pulmonary injury and disease related to environmental tobacco or oxidative stress.

* **Silcox, Roy W.**, *Associate Professor* (1990): BS BYU 1981, MS North Carolina State 1984, Ph.D., North Carolina State University, 1986. Mammalian reproductive physiology; characterization, enhancement, and manipulation of ovarian function. On Leave thru. 07/2018.

^* **Stark, Michael R.**, *Assistant Professor* (2001): BS BYU 1992, MS Idaho State University 1994, Ph.D., University of California, Irvine, 1998. Developmental Biology – how neuronal precursor cells communicate with one another during early events in nervous system development. Research in the lab focuses on identifying molecules involved in early cranial placode development. Currently, we are investigating the role of Wnts, Frizzleds, FGFs and FGF receptors in trigeminal placode development.

^* **Sudweeks, Sterling N.**, *Associate Professor* (2001): BS BYU 1992, Ph.D. University of Utah, 1997. Modulation of ligand-gated ion channel physiology by gene expression. These channels are involved in synaptic transmission and implicated in several conditions (e.g., epilepsy, Alzheimer's disease, Parkinson's disease, motor disorders, and schizophrenia). They are also the pharmacological targets in many therapeutic situations (e.g., any general anesthetics, sedatives, antiemetics, and even more novel analgesics).

^* **Suli, Arminda**, *Assistant Professor* (2013): BS BYU 1999, Ph.D. University of Utah, 2007. Neural Circuitry Development. The mechanisms that oversee proper development and formation of neural circuits. The development and innervation of specialized mechanosensory cells which are crucial for hearing and balance.

* **Thomson, David M.**, *Assistant Professor* (2008): BS BYU 1999, MS, BYU 2001, Ph.D., East Carolina University, 2005. Intracellular signaling pathways controlling skeletal muscle growth and metabolism.

^* **Wisco, Jonathan J.**, *Associate Professor* (2001): BS University of Washington 1994, Ph.D., Boston University School of Medicine, 2003. Translational anatomy of degenerative diseases and developmental disorders. Primary focus on histological validation of MRI biomarkers for Alzheimer's disease, cardiovascular disease, schizophrenia, and autism. Secondary focus on gross anatomical validation of new technique in the practice of radiology, cardiology, head and neck surgery, and anesthesiology.

^* **Woodbury, Dixon J.**, *Professor and Chair for the Department of Physiology and Developmental Biology* (2001): BA University of Utah, 1980. Ph.D., University of California, Irvine, 1986. Cellular and molecular physiology, particularly vesicle membrane fusion in neuronal cells and its block by botulinum toxin.

B. AFFILIATED GRADUATE FACULTY

Bangerter, Neal K., *Associate Professor of Electrical and Computer Engineering* (2008): BS, University of California, Berkeley, 1995. MS, Stanford, 2001. Ph.D., Stanford, 2004. He and his students develop new algorithms, software, and hardware that seeks to improve the quality and capabilities of MRI.

Bigler, Erin, *Professor of Psychology*: BS, Brigham Young University, 1971. Ph.D., Brigham Young University, 1975. Clinical Neuropsychology and neuroimaging investigations of typical and atypical brain development, traumatic brain injury along with aging and neurodegenerative disease.

^ **Charles, Steven K.**, *Assistant Professor of Mechanical Engineering*: Ph.D., Harvard-MIT Division of Health Sciences and Technology, 2008. Biomechanics and neural control of movement, movement disorders, and technology for assisting and rehabilitating.

Cook, Alonzo D., *Associate Professor Chemical Engineering* (2012): BS, Brigham Young University, 1989. MS, Brigham Young University, 1991. Ph.D., Massachusetts Institute of Technology, 1996. Peripheral nerve regeneration.

Flom, Ross., *Associate Professor of Psychology* (2001): BS, University of Minnesota, 1992. MS, Idaho State University, 1993. Ph.D., University of Minnesota, 1999. How various organisms, including humans, attend to multimodal or multisensory properties of their environment Examining how early and/or impaired sensory experience, i.e, prematurity of birth, blindness, hearing loss, etc. affects multisensory development in human infants.

Gale, Shawn, *Associate Professor of Psychology*: Ph.D., Brigham Young Univeristy, 1994. Postdoctoral Fellowship, LDS Hospital, 1995. Neuropsychology, Epilepsy, Tramatic Brain Injury, and Memory.

^ **Hedges, Dawson W.**, *Associate Professor of Psychology*: MD, University of Utah, 1988. Psychiatry; Neuroscience; Neuroimaging, Effects of stress on brain structure.

^ **Higley, J. Dee**, *Professor of Psychology*: Ph.D., University of Wisconsin—Madison, 1985. Primate Behavior, Development, Development Psychopathology, Focus on Alcoholism and the Effects of Parents and Genes on Development and Adolescent Outcomes.

Holt-Lunstad, Julianne, *Associate Professor of Psychology*: BS, MS, Brigham Young University, 1998. Ph.D., University of Utah, 2001. There is now robust evidence of the protective effects of social relationships both on morbidity and on mortality, with a magnitude of effect comparable with many well-established risk factors such as smoking cessation and obesity.

^ **Hopkins, Ramona O.**, *Professor of Psychology*: Ph.D., University of Utah, 1996. Cognitive Neuroscience Psychology; Learning and Memory; Neurobiological Approaches to Cognition; Neuroimaging; Health Related Quality of Life. Neuropsychological outcome following critical illness, cardiac and pulmonary disorders.

Kauwe, John “Keoni”, *Associate Professor of Biology*: MS, Brigham Young University, 2001. Ph.D., Washington Univeristy, St. Louis, 2007. Genetic risk factors for Alzheimer's disease.

^ **Kirwan, Brock**, *Assistant Professor of Psychology*: Ph.D., Johns Hopkins University, 2006. Long-term declarative memory.

^ **Larson, Michael J.**, *Assistant Professor of Psychology*: Ph.D., University of Florida, 2008. Mechanisms of Cognitive Dysfunction Following Traumatic Brain Injury.

Luke, Steven, *Assistant Professor of Psychology*: BS, Brigham Young University, 2003. MS, Ph.D., University of Illinois, Urbana-Champaign, 2011. Eye Movements, Reading & Language, Visual Cognition.

Lundwall, Rebecca, *Assistant Professor of Psychology*: BS, M.Ed, Brigham Young University, 1990. MS, Ph.D., Rice University, 2013. Development of Visual Cognition with Special Focus on Genetic Contributions.

McPherson, David, *Professor of Audiology & Speech Language Pathology*: BS, Brigham Young University, 1966. MS, George Washington University, 1969. Ph.D., University of Washingotn, 1972. Post-Doctoral Fellow, Brain Research Institute, U.C.L.A., 1973. Event Related Potentials in Language, Cognitive, and Auditory Processing, Neurophysiology, Sensory Development.

Porter, Chris L., *Associate Professor of Family Life*: BS, Brigham Young University, 1990. MS,

Ph.D., Purdue University, West Lafayette, 1996. Socialization of Behavioral and Psychophysiological of Children's Individual Characteristics

South, Mikle D., *Associate Professor of Psychology*: BA, Yale University, 1994. MS, Ph.D., University of Utah, 2005. Autism Spectrum Disorders, Developmental Disabilities on Families.

^ **Steffensen, Scott C.**, *Associate Professor of Psychology*. Ph.D., University of Utah, 1986. Neuropharmacology; Neurobiology of Addiction; Learning and Memory

* May serve as Committee Chair for PDBio Graduate Students

^ May serve as Committee Chair for Neuroscience Graduate Students

(As of 2008)

II. APPLICATION AND ADMISSION TO THE GRADUATE PROGRAM

Complete information and general procedures to apply to graduate school at Brigham Young University are contained in the Graduate Catalog (online at <http://www.byu.edu/gradstudies>). The following summarizes some of that information and adds departmental requirements that are supplementary to the catalog.

A. *Application Procedure*

A person applying to one of the MS or Ph.D. degree programs should apply online at: <http://www.byu.edu/gradstudies/admissions/applynow.php>. A non-refundable fee of \$50 is required. The Letter of Intent must explicitly state the applicant's field of interest and career goals. Doctoral applicants with a Baccalaureate degree from BYU (any campus) are generally encouraged to apply to a different institution for the Ph.D. degree programs, although they may apply for the MS programs.

B. *Standardized Tests*

Doctoral applicants must furnish Graduate Record Examination (GRE) scores. Master's applicants must submit scores for a national standardized exam (i.e., GRE General Test (preferred), MCAT, or DAT).

Non-US applicants must provide sufficient documentation to permit an appropriate evaluation of their previous academic performance. Applicants whose native language is not English must also successfully complete the TOEFL or IELTS examination with a minimum score as given below.

LANGUAGE TEST	MINIMUM SCORE
IELTS	6.0 in each section, 7.0 overall
TOEFL PBT (paper-based)	580
TOEFL iBT	85 (22 in Speaking, 21 in Listening, Reading, & Writing)

C. *Prerequisites*

Research experience is strongly encouraged before entrance into one of our graduate programs. The advisor of the undergraduate research should write one of the letters of recommendation. Before entrance into graduate school, applicants should have broad exposure to the sciences and have taken **upper** division courses in their area of interest. Specifically, applicants are expected to have taken all or all but one of the prerequisite courses listed below (examples from the BYU undergraduate catalog are given after each prerequisite).

Prerequisites for MS and Ph.D. in Physiology and Developmental Biology	Prerequisites for MS and Ph.D. in Neuroscience
College Physics (e.g. Phscs 105,106) Cell/Molecular Biol. (e.g. PDBio 360) Biochemistry (e.g. Chem 481) <u>One of the following:</u> Physiology with lab (e.g., PDBio 362, 363) Developmental Biol. (e.g., PDBio 482)	Two advanced courses covering Molecular/Cellular/Behavioral aspects of Neuroscience (e.g. Neuro 380, 480) Biochemistry (e.g. Chem 481) Physiology with lab (e.g., PDBio 362, 363)

D. Application Deadlines

Application deadlines are listed in the table below. For priority consideration the completed application must be received by February 1. Applications received between February 1 and September 10 will be considered based on availability of open positions in Fall or Winter.

Submission deadline*	Departmental decision	Expected date for student notification	Earliest start date	Usual start date
Feb 1	Feb 15	Feb 25	Spring	Fall
May 1	May 15	May 25	Fall	Fall
Sept 10	Oct 1	Oct 10	Winter	Winter

* Date by which all application materials must be received at the BYU Office of Graduate Studies.

E. Acceptance Criteria

Before acceptance, applications are screened by the Department Graduate Committee, and approved by the Department Faculty, Chair, and BYU Graduate Office. Applications will not be considered until standardized exam scores are included in the student's file. Typically, doctoral applicants have a combined GRE score greater than 1150 and master applicants greater than 1070 (V+Q). The following items are considered in the evaluation of each application to the Department of Physiology & Developmental Biology for entrance into the MS or Ph.D. program.

- Grade Point Average in upper division classes over last 60 semester hours (3.0 minimum)
- Scores on national standardized examination.
- Courses completed in Physiology, Developmental Biol., Neuroscience and related subjects.
- Letters of Recommendation (one from research advisor, if applicable)
- Letter of Intent (containing field of interest and career goals)
- Availability of an opening with a faculty member in the focal area of research interest
- Academic credentials and accompanying recommendations in comparison with those of other applicants to our department for the same date of entry

F. Financial Assistance

The Department strives to provide substantial financial support to all graduate students. This section outlines what is provided and how to apply for additional funds.

1. Teaching and Research Assistantships

a) MS Students

MS students may be funded through research assistantships (RA) from the lab they are working in, but if funds are not available they are also eligible to apply for financial support in the form of teaching and research assistantships, although such support is not guaranteed. Teaching assistantships are awarded by the Department based on the qualifications of the graduate student and availability of positions. RAs are also available through various university programs (see section 3 below) and provide the same level of support as a TA while allowing the student to work full time in the research lab. MS students usually receive up to \$1,000 per semester for tuition for four semesters. Frequently, additional tuition monies are available from the Department during Spring and/or Summer Terms, but are not guaranteed. Departmental support beyond the second year may be sought and will be considered when funds exist.

b) Ph.D. Students

Ph.D. students are guaranteed four years of financial support through Teaching Assistantships (TA) or Research Assistantships (RA) Fall, Winter, and Spring/Summer. It is expected that the Major Advisor will provide at least 1/3 of this support through external monies. Four years of full tuition support is also provided for Ph.D. students. Beyond four years students may apply for additional departmental support.

2. Graduate Student Travel Funds

Graduate Students may apply to BYUGSS for GSS Funds and/or their Committee Chair for Department funds to help defray the cost of attending a national scientific conference (see section 3 below). Priority for travel requests will be given to those students who:

- Have filed their Prospectus by the proposed date of travel.
- Are an author on the abstract (priority funding given to first authors).
- Submit a budget to your Committee Chair including transportation, registration, housing, food, and other expenses (form D-5, available from the Department Graduate Secretary).

3. Additional Student Funding Opportunities

Graduate students may also apply for the following Department/College/University funding opportunities, depending on their needs and qualifications.

ADDITIONAL FINANCIAL ASSISTANCE AVAILABLE	Deadlines
UNIVERSITY AWARDS	
<p>GRADUATE RESEARCH FELLOWSHIP: \$4500 / \$6,000 (Master's / Doctoral) in university-wide competition. This award supports graduate students for one semester (full awards are approximately three times the stated level) and is provided by the Research Office. Details and applications can be found online at: http://www.byu.edu/gradstudies/grantsfellowships/grantsfellowships.php?id=57</p>	Feb 1
<p>RESEARCH PRESENTATION AWARD: A travel award given by BYUGSS. Awards are around \$400 and are for presenting graduate research at a national/international conference. Applications are accepted every fall and winter semester. Details and applications can be found online at http://www.byu.edu/gss.</p>	Typically Feb 1 and Oct 1
DEPARTMENT AWARDS	
<p>TUITION SCHOLARSHIPS: The Department awards 4-6 tuition scholarships yearly to both undergraduate and graduate students. Most awards provide half tuition for one semester. These funds come from the Ted & Della Hanks Scholarship and Physiology & Developmental Biology Scholarship. Scholarships are awarded based on academic and laboratory performance to students engaged in research within the Department. Applications can be obtained from the College Advisement Center Office - 380 WIDB at the beginning of Winter Semester.</p>	Feb 1
<p>RESEARCH ASSISTANTSHIPS: The Department awards 6-8 RAs yearly to graduate students. Assistantships are awarded based on academic and laboratory performance to students engaged in research within the Department.</p>	One month before the start of each semester
<p>699-799 RESEARCH FUNDS: (Form D-4) \$300 - \$400/year for research related expenses (lab supplies, necessary software, etc). Must submit Prospectus in advance.</p>	No deadline. Submit early in calendar year.
<p>DEPARTMENT TRAVEL AWARD: About \$600 per student per year is available for travel to present graduate research at a national/international conference. See instructions above.</p>	At least one month before travel date.

4. Qualifications for Graduate Financial Awards

To qualify for financial support (e.g., Assistantship, Travel, and Tuition Award) candidates must be in good standing with a 3.0 GPA minimum and be registered for at least 6 hours per semester or 1 hour per term (only 2 hours per semester and 1 hour per term during the last semester of study).

III. INFORMATION FOR NEW GRADUATE STUDENTS

A. General Information

These guidelines have been prepared for the graduate student in Physiology & Developmental Biology, and must be used in conjunction with those contained in the BYU Graduate Catalog. The BYU Graduate Catalog can be found online at: <http://saas.byu.edu/catalog/>.

1. Keeping Current

Graduate students must keep current on changes made each year in the graduate program, at both the Department and the University level. The ultimate responsibility to comply with all department and university requirements rests with the student. Forms for requesting exceptions to graduate policy are available in the department office. Petitions may need to be signed by the chair of the advisory committee, Department Graduate Committee Chair, Department Chair, and Dean, and sent to the BYU Graduate Office.

2. Financial Assistance

The Department strives to provide substantial financial support to all graduate students. This is typically in the form of teaching assistantships (TA) and research assistantships (RA). TA assignments are made by the Graduate Coordinator and specific requests to TA a particular course should be submitted in writing (e.g., email) to either the Graduate Secretary or Graduate Coordinator four weeks before each semester. Additional financial assistance is also available as described in section II.F (page 8).

B. Lab Rotations and Mentor Selection

The purpose of lab rotations is to help new graduate students to identify a mentor with whom he/she would like to work. Additionally, rotations help students to select potential research projects and to learn techniques not available in their mentor's lab.

1. MS Students

There will be no laboratory rotations required if the student has selected a mentor prior to starting their MS program. However, if a student does not have a mentor selected, then they may do laboratory rotations (PDBio 649R or Neuro 649R) with eligible faculty members of their choice. If desired, the student can seek advice about possible rotation laboratories from the department Graduate Committee or other faculty members. Rotations will take place during the student's first semester into the MS program. Once an MS student decides on a mentor, no further rotations are required. Since time is of the essence in the successful completion of a Master's degree, the selection of an advisor should be completed no later than the end of the first semester. Note that the MS program in Neuroscience has different requirements than PDBio, and that PDBio has two emphases (physiology and developmental biology) with slightly different requirements (listed on pages 13-17 sections III.E to III.G).

2. Ph.D. Students

To provide a broader exposure to faculty research interests, generally 3 laboratory rotations (of 3 credits each) are expected for all Ph.D. students (for a total of at least 9 credit hours of PDBio 649R or Neuro 649R). These will occur during the first year of graduate study. For example two rotations on the block schedule of fall semester (3 credits each), and one during the winter

semester (or possibly the summer term before). **Laboratory rotations consist of active participation in the lab, with a time commitment of at least 20 hours per week** per block or 10 hours per week per semester. The student is responsible for choosing rotation laboratories, and for making the arrangements to do so. If desired, the student may consult the graduate committee or other faculty members to help decide what laboratories to include.

C. Advisory Committee and Program of Study

Your Advisory Committee and your course outline are established by the same form (“Program of Study for Graduate Students”, University Form #3). This form is available from the Department Graduate Secretary or online at: http://www.byu.edu/gradstudies/images/forms/ADV_Form_3.pdf.

In cooperation with your Major Advisor, you should select committee members and a program of study appropriate to your graduate program. Committee members provide support, feedback, and supplemental guidance to graduate students and should be regularly available to the student. Some faculty may not be available to serve on a graduate committee because of prior responsibilities.

1. Procedure for Committee Selection

Clear these names with your Major Advisor and the Department Graduate Coordinator. Contact each member individually and ask him/her to be on your Advisory Committee. Schedule a committee meeting after you discuss a tentative course outline with your Major Advisor (see section III.C.2). If you have declared a minor, one committee member must be from that department. If you have asked a graduate faculty member from another university to be on your committee, you must fill out a Petition for Exception stating your reason(s) and obtain the appropriate information and signatures for the Office of Graduate Studies approval. Committee members must be selected according to the following university rules:

	MS	Ph.D.
# Departmental Members	2 (minimum)	3-4
# Members outside Department	1 (minimum)	1-2
Total Members*	3 (minimum)	5 (minimum)

*Additional appointments may be made to suit the needs of the individual program.

2. Program of Study (Course Outline)

Consult with your Advisor about your Program of Study. The sections below (see III.D and III.E) list general university and departmental requirements for both MS and Ph.D. programs, however significant latitude is allowed for individually tailored graduate programs. The final Program of Study must be approved by your committee. You should fill out a trial Program of Study form and have it with you when you first meet with your Advisory Committee. After committee approval, you should type the official form (see III.C above), obtain the signatures of your advisory committee and the Graduate Coordinator, and return the form to the Department Graduate Secretary.

3. Deadline to file Program of Study

All graduate students must file their “Program of Study for Graduate Students” form according to the deadlines given below. To maintain status as an active graduate student it is important to get this form in on time. If necessary, changes can be made by filing a change form signed by your committee and graduate coordinator).

Program	MS	Ph.D.
Deadline to file	3 weeks after end of 1st Semester	3 weeks after end of 1st Year

D. University Requirements

BYU stipulates the following minimum standard for graduate programs:

1. Credit Hours

a) MS

- The minimum requirement is for **30 credit hours** (24 course work and 6 thesis hours); 20 hours must be in the 500 series or above (can include 699R, etc.)
- No more than 10 hours of non-degree credit and no home study (except prerequisites) can be applied toward the MS degree.
- Undergraduate credit. The Office of Graduate Studies allows up to 9 credit hours of undergraduate courses (e.g. BYU 300-400 level) if it pertains to the area of study. If more than that is needed for your course outline, a Petition for Exception is required for approval.

b) Ph.D.

- The minimum required for students with no master’s degree is **54 credit hours** beyond the baccalaureate degree; the 54 hours may not include undergraduate (100 to 400 level) or more than 18 hours of dissertation credit. Students who have earned a master’s degree must complete at least 36 semester hours of additional graduate work at BYU beyond the master’s degree.

2. Transfer Credit

Transfer Credit (or credit requested for classes taken but not counted in any previous degree program) should be graduate numbers or equivalent, B grades or better, and no more than 10 hours.

- No foreign credit without certification by examination
- No lower division credit
- No extension credit
- No "P" (pass/fail) credit

3. Minimum Registration

The minimum registration for all active graduate students is 6 hr/semester and 1 hr/term, especially where funding is being provided by BYU. Registration of only 2 hr/sem (1 hr/term) is possible when all course work has been completed. The University will drop any Graduate Student that does not take at least 6 credit hours in any academic year.

Students who are enrolled for Winter Semester *and* who will also be enrolled for Fall Semester are eligible to work on campus during Spring and Summer Terms without taking classes during either term. However, any student employee who is not enrolled in at least 1 hr/term must pay the FICA tax during that term.

During the semester or term in which a student finishes their graduate program they must also be registered for a minimum of 2.0 credit hours.

4. Interrupted Graduate Program

Students who desire to interrupt their graduate programs at BYU or are dropped (e.g. by not maintaining 6 hr/yr continuous registration), may request readmission. Before taking leave the student must receive departmental approval for the leave by submitting University Form GS-6 “Application to Resume Graduate Study.” The student should meet university conditions as provided on the instructions and as explained in the University’s Graduate Catalog under “Readmission” (<http://www.byu.edu/gradstudies/forms/catalog.php>). This form is available from the Department Graduate Secretary. Note that leave will only be granted once and for not more than 2 years. This interrupted time period will still count in the University’s determination of 5 years maximum for an MS program and 8 years maximum for a Ph.D. program at BYU.

E. Departmental Requirements

Requirements for all graduate programs are listed in this section. Suggested courses of study for PDBio degrees are given below in section F and for Neuroscience degrees in section G.

1. Prerequisite Classes

Students are expected to have taken all but one of the prerequisite classes (or equivalent). These classes are listed above in the table under section II.C and in the next section below the course map. Any deficiency should be made up during the first year. As specified above in section III.D “University Requirements”, up to 9 credit hours of advanced undergraduate classes can be counted toward the MS degree.

2. Seminar/Presentation Requirement

MS and Ph.D. students are required to present one seminar on their research or research interests each year to the department. Typically, presentations are 25 minutes and presented Fall semester as part of PDBio or Neuro 694R. All graduate students are also expected to attend weekly seminars (PDBio 696R or Neuro 696R). Seminar attendance is recorded and at least 80% attendance is required for a passing grade.

3. MS in PDBio

a) Required Courses (24-26 hours): Credits:

Biol 503	Research orientation	1
PDBio 694R	Presentation of research in progress	1
PDBio 696R	Seminar	2
Stat 511	Statistical Methods for Research 1	3
PDBio 699R	Master’s Thesis	6

One of the following Classes:

PDBio 601	Cellular and Molecular Physiology (Physiology emphasis)	3
PDBio 582	Developmental Genetics (Developmental Biology emphasis)	3

Choose at least 3 classes from the following list (7.0-9.0 hrs required):

PDBio 561	Physiology and drug mechanisms	3
PDBio 562	Reproductive physiology	3
PDBio 565	Endocrinology	3
PDBio 568	Cellular Electrophysiology & Biophysics	3
PDBio 582	Developmental Genetics	3
PDBio 601	Cellular and Molecular Physiology	3
PDBio 650R	Selected Topics in Physiology, Developmental Biology, & Neuroscience	1-3
MMBio 662	Genomics, Molc. Evolution and Devel. Biology	3
PDBio 664	Cardiovascular and Respiratory Physiology	2
Psych 586	Hormones and behavior	3

b) Elective Courses

Additional courses to meet the 30 (minimum) credit hour requirement should be determined in conjunction with your graduate committee. Some possible courses are listed below the course map in the next section. In addition, MS students may wish to consider the following courses:

PDBio 649R	Laboratory research	variable
PDBio 550R	Advanced topics in Physiol./Devel. Biol.	1-4
Chem 462	Physical Chemistry	3
Chem 463	Physical Chemistry	3
Chem 464	Physical Chemistry Laboratory	1
Chem 468	Biophysical Chemistry	3
Chem 482	Biochemistry 2	3
Chem 489	Structural Biochemistry.	3
MMBio 430	Advanced Cell Biology	3
PDBio 689R	Practicum in Teaching/Research	3

4. MS in Neuroscience

a) Required Graduate Classes(19-23 hours):

Credits:

Biol 503	Research orientation	1
Neuro 649R	Neuroscience Laboratory	2 (max 6 hr)
Neuro 694R:	Presentation of research in progress	1
Neuro 696R:	Seminar	2
Stat 511	Statistical Methods for Research 1	3
Neuro 601	Graduate Neuroscience	3
Neuro 699R	Master's Thesis	6

b) Elective Courses

Additional courses to meet the 30 (minimum) credit hour requirement should be determined in conjunction with your graduate committee. Some possible courses are listed below the course map in the next section.

5. Ph.D. in PDBio

a) Required Graduate Classes:

Credits:

Biol 503:	Research orientation	1
PDBio 689R	Practicum in Lf Sci Teaching or Research	1 (min.)
PDBio 694R:	Presentation of research in progress	2 (min.)
PDBio 696R:	Seminar	2 (min.)
Stat 511	Statistical Methods for Research 1	3
PDBio 601*	Cellular and Molecular Physiology	3
PDBio 582*	Developmental genetics	3
^PDBio 649R	Laboratory research (rotations)	6-9 [#]
PDBio 799R	Doctoral Dissertation	18 [#]

*Preparation equivalent to the prerequisites for PDBio 601 and PDBio 582 is required.

^At least one semester (3 credits) of this experience must be performed in a laboratory different than the laboratory of the student's Graduate Committee Chair. Typically, two rotations are taken during the first semester (simultaneously or sequentially).

[#]Research credit (PDBio 649R & 799R) may not exceed 27 hours.

b) Elective Courses

Additional courses to meet the 54 (minimum) credit hour requirement should be determined in conjunction with your graduate committee. Some possible courses are listed below the course map in the next section.

6. Ph.D. in Neuroscience

a) Required Graduate Classes:

Credits:

Biol 503	Research orientation	1
PDBio 689R	Practicum in Lf Sci Teaching or Research	1 (min.)
Neuro 694R:	Presentation of research in progress	2 (min.)
Neuro 696R:	Seminar	2 (min.)
Stat 511	Statistical Methods for Research 1	3
Neuro 601	Graduate Neuroscience	3
*Neuro 649R	Neuroscience Laboratory (rotation)	9
Neuro 799R	Doctoral Dissertation	18

*At least one semester (3 credits) of this experience must be performed in a laboratory different than the laboratory of the student's Graduate Committee Chair. Typically, two rotations are taken during the first semester (simultaneously or sequentially).

b) Elective Courses

Three (3) credit hours of course work (600 level and above) must be taken outside the primary area of research. Additional courses to meet the 54 (minimum) credit hour requirement should be determined in conjunction with your graduate committee. Some possible courses are listed below the course map in the next section.

F. Suggested two year course work map for PDBio Grad. Programs

MS (emphasis: Physiology)	MS (emphasis: Develop. Biology)	Ph.D.
<u>1. Fall Semester (10 CrHrs):</u> PDBio 601 (3) Biol 503 (1) PDBio 649R-rotation/research (2) PDBio 696R (0.5) PDBio 694R (0.5) Prerequisite (e.g. PDBio 362-363) or Elective (2-4) <i>Funding: TA</i> File: Program of Study	<u>1. Fall Semester (10 CrHrs):</u> Stat 511 (3) Biol 503 (1) PDBio 649R-rotation/research (2) PDBio 696R (0.5) PDBio 694R (0.5) Prerequisite (e.g. PDBio 482) or Elective (2-4) <i>Funding: TA</i> File: Program of Study	<u>1. Fall Semester (11 CrHrs):</u> PDBio 601 (3) Biol 503 (1) PDBio 649R-rotation (3) PDBio 696R (0.5) PDBio 694R (0.5) Prerequisite or 2nd rotation (2-4) <i>Funding: RA or TA</i>
<u>2. Winter Semester (5+):</u> PDBio 649R-research(2) PDBio 696R (0.5) Elective (2-4) <i>Funding: TA</i> File: Prospectus	<u>2. Winter Semester (9):</u> PDBio 582 (3) PDBio 649R-research (2) PDBio 696R (0.5) Elective (2-4) <i>Funding: TA</i> File: Prospectus	<u>2. Winter Semester (10):</u> PDBio 582 (3) PDBio 649R-rotation (3) PDBio 696R (0.5) Elective (2-4) <i>Funding: TA or RA</i>
<u>Spring/Summer (2-3)</u> Elective (3) or PDBio 649R (2) <i>Funding: RA from Lab (if available)</i> Coursework Orals	<u>Spring/Summer (2-3)</u> Elective (3) or PDBio 649R (2) <i>Funding: RA from Lab (if available)</i> Coursework Orals	<u>Spring/Summer (2-3)</u> Elective (3) or PDBio 649R (2) <i>Funding: RA</i> File: Program of Study
<u>3. Fall Semester (8):</u> Stat 511 (3) PDBio 696R (0.5) PDBio 694R (0.5) Elective (2-4) PDBio 699R (2) <i>Funding: TA</i>	<u>3. Fall Semester (6):</u> PDBio 696R (0.5) PDBio 694R (0.5) Elective (2-4) PDBio 699R (2) <i>Funding: TA</i>	<u>3. Fall Semester (7+):</u> Stat 511 (3) PDBio 696R (0.5) PDBio 694R (0.5) Elective (2-4) <i>Funding: RA/TA</i> File: Prospectus
<u>4. Winter Semester (5):</u> PDBio 696R (0.5) PDBio 699R (4) <i>Funding: RA</i>	<u>4. Winter Semester (5):</u> PDBio 696R (0.5) PDBio 699R (4) <i>Funding: RA</i>	<u>4. Winter Semester (6+):</u> PDBio 696R (0.5) Elective (2-4) PDBio 649R (2-3) <i>Funding: RA/TA</i> Comprehensive Exam
<u>Spring/Summer: Graduate</u>	<u>Spring/Summer: Graduate</u>	<u>Spring/Summer (2-3)</u>

*TA=Teaching Asst, RA=Research Asst.

Prerequisites:

Cell/Mol. Biol. (e.g. PDBio 360)
 Organic Chemistry (e.g. Chem 352)
 Biochemistry (e.g. Chem 481)
 College Physics (e.g. Phscs 105, 106)
 One of the following:
 Physiology with lab (e.g., PDBio 362, 363)
 Developmental Biol. (e.g., PDBio 482)

Suggested Electives for first year:

*CHEM 482 Biochem 2 (3) W,Sp
 *Neuro 480 Adv. Neuro. (3) F,W
 PDBio 561 Physiol. or Drug Mech. (3) F,W
 PDBio 562 Repro. Physiol. (3) F even
 PDBio 565 Endo. (3) W
 PDBio 568 Cellular Electrophys. & Biophys. (3) F
 PDBio 661 Molecular Biol. of the Cell (3) F
 PDBio 662 Genomics, Molc. Evol, & Dev. Biol. (3) W

Additional Electives:

Neuro 601 Grad. Neuro (3) W
 PDBio 582 Devel. Gen. (3) W
 PDBio 601 Cell and Mol. Physiol. (3) F
 PDBio 650R Selected topics (when available) (1-3)
 PDBio 661 Molecular Biology of the Cell (3) F
 PDBio 662 Genomics, Mol Evol, Devel Bio (3) W
 PDBio 664 Cardio. & Resp. Physiol (2) F odd
 PDBio 695R Practicum in Teaching (arranged)
 Psych 586 Hormones and Behavior (3)
 CHEM 581 Adv. Biochem. Method 1 (3) F
 CHEM 583 Adv. Biochem. Method 2 (3) W
 CHEM 689R Adv. Topics in biochemistry (1-3)
 Stat 512 Statistical methods for research 2
 MMBio 557 Genes and Cancer (2) W odd
 MMBio 623 Immunology (2) F odd

*Ph.D. students do not receive credit for 400-level courses or lower.

G. Suggested two year course work map for Neuroscience Graduate Programs

Neuroscience – MS	Neuroscience – Ph.D.
<u>1. Fall Semester (9-11CrHrs):</u> Biol 503 (1) Neuro 696R (0.5) Neuro 694R (0.5) Neuro 649R (2-3)-Research/rotation Neuro 601 (3) Stat 511 (3) or Prerequisite Elective (2-4) or Prerequisite <i>Funding: TA*</i> <i>File: Program of Study</i>	<u>1. Fall Semester (11CrHrs):</u> Biol 503 (1) Neuro 696R (0.5) Neuro 694R (0.5) Neuro 649R- (3)-Rotation Stat 511 (3) or Prerequisite Prerequisite or 2nd rotation (2-4) <i>Funding: RA*</i>
<u>2. Winter Semester (8-11):</u> Neuro 696R (0.5) Neuro 649R-research (2-3) Elective (2-4) <i>Funding: TA</i> <i>File: Prospectus</i>	<u>2. Winter Semester (8-11):</u> Neuro 601 (3) Neuro 696R (0.5) Neuro 649R-rotation (3) Elective (2-4) <i>Funding: TA</i>
<u>Spring/Summer (2-3)</u> Elective (3) or Neuro 649R (2) <i>Funding: RA from Lab (if available)</i> <i>Coursework Orals</i>	<u>Spring/Summer (2-3)</u> Elective (3) or Neuro 649R (2) <i>Funding: RA</i> <i>File: Program of Study</i>
<u>3. Fall Semester (6-7):</u> Neuro 696R (0.5) Neuro 694R (0.5) Neuro 649R (2) Elective (3-4) <i>Funding: TA</i>	<u>3. Fall Semester (8):</u> Neuro 696R (0.5) Neuro 694R (0.5) Neuro 649R (2-3) Elective (2-4) <i>Funding: RA/TA</i> <i>File: Prospectus</i>
<u>4. Winter Semester (~7):</u> Neuro 696 (0.5) Neuro 699 (6) <i>Funding: RA</i>	<u>4. Winter Semester (8):</u> Neuro 696 (0.5) Neuro 649R (2-3) Elective (2-4) <i>Funding: RA/TA</i> <i>Comprehensive Exam</i>
<u>Spring/Summer: Graduate</u>	<u>Spring/Summer (2-3)</u>

*TA=Teaching Asst, RA=Research Asst.

Prerequisites:

Behavioral Neuroscience (e.g. Neuro 380)
 Advanced Neuroscience with lab (e.g. Neuro 480, 481)
 Physiology with lab (e.g., PDBio 362, 363)
 Biochemistry (e.g. CHEM 481)

Suggested additional prerequisites

Cell/Mol. Biol. (e.g. PDBio 360)
 Organic Chemistry (e.g. Chem 352)
 College Physics (e.g. Phscs 105, 106)

Some Suggested Electives:

CHEM *482, 581, 583, 689R
 COMD 601 Neurofoundations of Language, Speech and Hearing (3)
 PDBio 561, 562, 565, 568, 582 or 601, 650R (when available), 661, 662, 664, 695R
 Psych 586 Hormones and Behavior (3)
 Stat 512 Statistical methods for research 2

*Ph.D. students do not receive credit for less than 400-level courses

IV. Continuing expectations and requirements

A. Satisfactory Progress

A graduate program is a full-time commitment. It is expected that each student will demonstrate satisfactory progress toward the degree. This includes meeting university minimums for GPA (3.0) and making timely progress in the program steps outlined below. It is also expected that graduate students will meet with their graduate committee at least once a year to assess progress in the Program of Study and thesis/dissertation research (see section IV.B.3). Students should also display a cooperative attitude and adhere to the university's standards of conduct. It is expected that all students will maintain academic honesty as defined in the University Honor code (online at http://honorcode.byu.edu/index.php?option=com_content&task=view&id=5302&Itemid=5698.)

1. Performance Evaluation

To meet federal and university requirements, departments evaluate academic performance of graduate students twice annually. Three categories can be reported: *Satisfactory*, *Marginal*, and *Unsatisfactory*. Students who have been given a *Marginal* or *Unsatisfactory* evaluation will be notified in writing explaining the evaluation and expectations for satisfactory progress. Graduate students with a current *Unsatisfactory* evaluation are not eligible to receive federal aid. The university will automatically drop any student that receives two sequential evaluations that are less than *Satisfactory*. Evaluation Form D-6 must be filed at the end of each fall and winter semesters.

2. Grievance Procedures

Students that feel they have been unfairly treated or evaluated, may appeal to the Departmental Graduate Committee, then to the Department Chair and finally to the University. To file a grievance with the University submit the form "Request for Review" which can be found online at: http://www.byu.edu/gradstudies/images/resources/grievance_policy.pdf.

B. Research Project

All graduates are expected to complete a significant and publishable research project.

1. Selection of Research Project

In most instances you are expected to originate and plan your own research project that will be acceptable to your Advisory Committee. This is done in consultation with your Research Advisor. If your interests are not commensurate with the capabilities or interests of your advisor, select another advisor or change your research plan as necessary.

2. PROSPECTUS

After selecting your research project a Prospectus of Research must be filed with the Department. This is a thorough (10-20 page) description of your proposed research and is described below. After filing, students become eligible for additional types for financial assistance, as described in section II.F (page 8).

- a) The purpose of the prospectus is to obtain committee approval to proceed with your research project. This approval is an official statement by the department that completion of the proposed project will be sufficient for a Dissertation/Thesis. The prospectus

should demonstrate that the graduate student (1) understands current literature in the field of research, (2) has selected a research project that is significant and appropriate in scope, and (3) has sufficient training and resources to appropriately perform and analyze the experiments.

- b) Generally, the main sections of the prospectus will include:
- COVER PAGE (Form D-1)
 - TITLE (containing good “retrieval” words)
 - INTRODUCTION (review of literature and background for project)
 - PROPOSAL (hypothesis, objectives and an overview of the experimental design)
 - METHODS (usually includes details of the experimental design, methods, and sources of uncommon materials and animals, etc.)
 - ADDITIONAL COSTS (must include information which will alert the Advisory Committee members if any expensive equipment or supplies will be needed that are not already available to you, and just how such expenditures are to be met)
 - REFERENCE LIST (must include sufficient references to assure Committee members that you are familiar with the proposed research area)
- c) The written prospectus is to be submitted to all members of the Advisory Committee and orally presented for evaluation and approval in an early Advisory Committee Meeting.
- d) A final copy with signatures on the cover page (and revisions, if necessary) of the prospectus should be submitted to the Department Graduate Secretary. It is due before the end of the second semester of resident study for MS students and by the end of the fourth semester for Ph.D. students. Students who have not filed on time lose priority for funding and may be dismissed if more than a semester late.
- e) If the research emphasis changes more than in a minor way after a prospectus is approved, the student must submit a new approved prospectus to the Department as soon as possible, and no later than one semester before graduation.

3. Periodic Review of Research

Periodic meetings with your Advisory Committee should be held 1-3 times each year. In these meetings research progress and/or difficulties should be presented and discussed. Between meetings, any member of the Advisory Committee can be consulted for help toward the research project; however, most detailed problems should usually be worked out with your Major Advisor.

C. Examinations

1. MS Program

- a) Course Work Oral Examination (CWO)

A CWO will be administered by all members of your Advisory Committee. This exam should be completed near the end of the first year of graduate study, but before the last semester of the program. Committee members will examine students on basic principles relevant to their program of study (physiology, developmental biology or neuroscience) and concepts related to the focal area of their research, as well as on any material indicated on

the official course outline. Each examiner is to evaluate you on your total performance and not merely on those questions which he/she asks. Upon satisfactory completion of this examination, the Chair submits Form D-2, "Evaluation of Examination" to the Graduate Secretary.

b) Oral Defense of Thesis

Each student must defend his/her thesis before the Advisory Committee in a public seminar (can count as required yearly seminar). University Form #8c ("Departmental Scheduling of Final Oral Examination") must be signed by your committee and then submitted to the Department Graduate Secretary within the time deadlines stipulated by the University and **a minimum of 2 weeks prior to the Presentation of Thesis—No Exceptions!** Prior to that defense, however, it is expected that the Advisory Committee will be actively involved in reviewing the thesis (see section D below), and that the members of the Advisory Committee and the student will have resolved matters of thesis content, format, sentence structure, table and figure organization, etc. Although the thesis presentation is open to the public, only members of the Advisory Committee may vote on the student's performance.

2. Ph.D. Program

a) Comprehensive Examination

This written examination will be administered by the student's advisory committee. Each member of the advisory committee prepares a set of questions for the student's response, and the answers to each set are returned to the appropriate faculty member for grading. The Chair decides on the specific format of this exam. Questions may include but are not limited to issues arising from class work and current literature related to the area of study. Class work related questions may be composed in association with other faculty, not of the committee, from whom the student took classes. However, grading should be at the discretion of the committee member, after consultation with another faculty member if necessary. Each examiner is to evaluate you on your total performance and not merely on those questions which he/she asks. The written examination will be followed by an oral examination that will delve deeper into the student's area of research emphasis. Upon satisfactory completion of both examination, the Chair submits form D-2 "Evaluation of Examination" to the Department Graduate Secretary.

- in Physiology and Developmental Biology.

The written examination is to be given after completion of PDBio 582 and 601 and no later than the beginning of the 3rd year (5th semester). It will assess the student's understanding of basic physiological principles with emphasis in both developmental biology and physiology, as well as on any material indicated on the official course outline.

- in Neuroscience.

The written examination is to be given after completion of Neuro 601 and no later than the end of the second year. It will assess the student's understanding of basic principles of neuroscience with emphasis in both psychological and cellular mechanisms, as well as on any material indicated on the official course outline.

b) Professional Development Requirement. See Departmental Form D-3.

Depending on the student's career goals (teaching versus research), a professional development requirement must be completed during the 3rd year of the program. This will include either teaching 10 hours of lecture in an appropriate course (with faculty mentor

guidance) or submitting a graduate research fellowship application to an appropriate funding source (BYU Graduate Office, NSF, NIH, etc.).

c) Defense of Dissertation.

Defense of Dissertation before your Advisory Committee: Essentially the same as for the Defense of Thesis for MS program described previously.

D. Thesis/Dissertation

It is strongly recommended that writing of the Thesis/Dissertation begin at least 4-6 months in advance of graduation since it frequently requires more time than anticipated. Typically, the prospectus forms the draft for the introduction section of the Thesis/Dissertation. The exact content of the Thesis/Dissertation is set at the discretion of the committee, but University, College and Departmental guidelines listed below must be followed. The final responsibility for compliance with all regulations for thesis/dissertation preparation rests solely with the graduate student. Theses and Dissertations may be submitted one of two ways: either electronically through <http://etd.byu.edu> or by submitting hard copies.

1. Format Requirements

Exact requirements for format are set by the university and described in: "Minimum Standards for Submitting Dissertations, Theses, or Selected Projects." This guide can be obtained from the Department Graduate Secretary or online at:

<http://www.byu.edu/gradstudies/forms/forms.php?s=advforms>. The following are additional Departmental guidelines.

- a) All university required pages are single-sided; the remainder of the work is to be double-sided. A current curriculum vitae should be appended to the end (double-sided).
- b) Typically four sections (single-sided) should follow the Abstract and be numbered with lowercase Roman numerals: Acknowledgements (may include grant support), Table of Contents, List of Tables, and List of Figures. These last three sections may follow the format used in this document (page 2) but should be double-spaced. Most word processors have built-in features for creating such tables automatically.
- c) An approved style guide for the Department needs to be followed, which is according to the writing style in the latest edition of the CBE Style Manual¹. Alternatively, if sections of the thesis/dissertation have been (or are going to be) submitted for publication in a refereed journal, the journal's format for submitted manuscripts may be followed.

2. Review and Approval

- a) Complete **Departmental Scheduling of Final Oral Examination** (University Form #8c) and submit it to the Department Graduate Secretary to schedule your Presentation of Thesis or Dissertation. This form must be submitted a **minimum of two weeks prior to your examination** and within the University time limit.

¹Science Reference Desk at HBLL Library, 2nd Floor, Call No. T 11.S386 (6th ed. 1994); or Call No. QH 304.C33 (5th ed. 1983, 2 copies available at HBLL).

- b) Submit a typed copy of your thesis/dissertation (including all ancillary pages required by the BYU Office of Graduate Studies), a curriculum vitae, and a copy of an example of a recent reprint from your preferred journal (if thesis/dissertation is in manuscript format) to each member of your Advisory Committee at least two weeks prior to your defense.
- c) Submit two copies of the thesis/dissertation in final form, to the Department Graduate Secretary at least two weeks before the examination. One copy will be forwarded to the Dean's Office where the Dean will read, but not sign it. The other copy will be checked for all format requirements. It will then be available for all interested parties to review prior to the defense. The BYU Office of Graduate Studies will not clear scheduling of oral exams unless this requirement is met. After you have passed your exam and had your committee members sign it, the thesis (in final form and format) is to be returned to the Graduate Secretary for signatures. Please note that the Dean does not sign a thesis/dissertation before reading it.
- d) Make one copy on bond paper of your abstract page and acceptance page for signatures before the defense.
- e) The first part of the examination will be a presentation of your research and will be open to all interested individuals. The second part will be an examination of your research and your thesis/dissertation by the faculty members in attendance. The final voting will be done ONLY by members of the Advisory Committee (as described above in section IV.C.1.b).
- f) After you pass the Presentation of Thesis/Dissertation examination, submit a finished copy of your thesis/dissertation to the Department Graduate Coordinator, who will examine everything, with emphasis on proper format.
- g) Prepare University Form #8d "Departmental Approval for Submission of Dissertation, Thesis, or Selected Project for Binding". This form comes in your Defense of Thesis/Dissertation/Project packet and will be given to you by your advisor at your defense. Upon approval from the Graduate Coordinator you will then forward it to the Department Chair, and then the Dean of the College for final signatures.

3. Copies for Binding

- a) Prepare at least three copies for binding as university copies. Using a pencil, mark the upper right-hand corner of the title page of each university copy and each personal copy with the appropriate abbreviation:
 - L1 Library copy (place this copy on top)
 - AC Advisory Committee Chair copy
 - DC Department copy
 - P1-P6 Personal/Committee copies
- b) Place each copy in an envelope and secure all the copies together with a large rubber band.

4. Submitting the Forms and Fees with Thesis/Dissertation Copies for Binding

- a) Doctoral students—Complete and sign the Microfilm Agreement Form. Attach an extra copy of the abstract to “Departmental Approval for Submission of Dissertation, Thesis, or Selected Project for Binding” (University Form #8d). If the dissertation is to be copyrighted, sign the Microfilm Agreement Form on the line indicated, and make the copyright notation on the title page.
- b) After University Form #8d has been signed, deliver it and any other necessary forms with your copies to the Library Cashier's Office, 3350 HBLL and pay the binding fees.

E. Program Deadlines

Plan to finish each step before the absolute deadline. Do not count on holding any committee meeting or examination at a time when school is not in session. It is the responsibility of the student to make sure the committee members will be available.

1. MS Students

Event	Time	Form*
Advisory Committee and Program of Study of Advisory Committee	No later than 3rd week of 2nd semester (student subject to dismissal if not submitted during 3rd semester)	U-3
Prospectus (present to Advisory Committee)	No later than end of 2nd semester (student subject to dismissal if not submitted during 3rd semester)	D-1
Course Work Oral	During 2nd year, at least 1 semester before final Defense of Thesis	D-2
Seminar presented to Department	Once per year	
Application for Graduation	During first month of semester of planned graduation	U-8a
Scheduling of Defense of Thesis and submission of Thesis to Department and to the Dean's Office for reading.	At least 2 weeks before final Presentation of Thesis	U-8c
Defense of Thesis (DOT)	Before University Deadline	
Submission of thesis to College Dean	At least two weeks before final DOT (for the Dean to read it), and again within one week after passing exam (for the Dean's signature)	
Submission of all thesis copies for binding	Within 2 weeks following DOT	U-8d

2. Ph.D. Students

<u>Event</u>	<u>Time</u>	<u>Form</u> *
Advisory Committee and Program of Study	No later than 3rd week of second year (student subject to dismissal if not submitted during 2nd year)	U-3
Prospectus (present to Advisory Committee)	No later than end of 1st semester of 2nd year (student subject to dismissal if not submitted during 2nd year)	D-1
Comprehensive Examination	No later than end of 2nd year (student subject to dismissal if not completed during 3rd year)	D-2
Seminar given to Department	Each year	
Application for Graduation	During first month of semester of planned graduation	U-8a
Scheduling of final Defense of Dissertation and submission of Dissertation to Department and to the Dean's Office for reading	At least 2 weeks before final Defense of Dissertation	U-8c
Defense of Dissertation	Before University Deadline	
Submission of dissertation to College Dean for signature	At least two weeks before defense of dissertation (for the Dean to read it), and again within one week after passing exam (for the Dean's signature)	
Submission of all dissertation copies for binding	Within two weeks following defense of dissertation	U-8d
Submission of Doctoral Survey to Office of Graduate Studies	Within 1 week after final submission of dissertation	

* U = University form (available online); D = Department form (available from Department Graduate Secretary)

V. Sample Forms

A. University Forms (available online)

The following university forms are available from the Department Graduate Secretary and may also be printed online at: <https://graduatestudies.byu.edu/content/all-forms>.

- 1. U-1 Request for Interdisciplinary Graduate Study**
- 2. U-2a Petition for Graduate Full-Time Status**
- 3. U-3 Program of Study/Advisory Committee**
- 4. U-3b Program of Study Change**
- 5. U-3d Graduate Degree Course Challenge Examination**
- 6. U-8a Requirements for Graduation Application**
- 7. U-8c Departmental Scheduling of Final Oral Examination
(Masters and Doctoral)**
- 8. U-8d Approval for Final Dissertation or Thesis**
- 9. Minimum Standards for Submission of Thesis, Dissertation, or
Project**
- 10. ETD Submission**
- 11. LaTeX Templates**
- 12. Graduate Student Request for No-Cost/No-Credit Religion Course**

B. Departmental Forms (Examples)

Examples of departmental forms are included on the following pages. They are available from the Department Graduate Secretary.

- 1. D-1 Approval of Prospectus**
- 2. D-2 Evaluation of Oral Examination**
- 3. D-3 Ph.D. Professional Development Requirement**
- 4. D-4 Application for 699-799 Funds**
- 5. D-5 Request for Student Travel**
- 6. D-6 MS MS Graduate Progress Review**
- 7. D-6 PhD PhD Graduate Progress Review**

APPROVAL OF PROSPECTUS

Name of Student

Date Approved

Major Advisor

Committee Member

Committee Member

Committee Member

Committee Member

EVALUATION OF EXAMINATION

- Coursework Oral Exam for MS Degree
- Comprehensive Exam for Ph.D. Degree

Name of Student: _____ Date of Exam: _____

Major Field: _____ Major Advisor: _____

Recommended Action:

1. Pass Without Qualification. Comments, if any:

2. Pass With Qualification. List in detail any qualification imposed upon the student:
Retake date _____ (one time only)

3. Not Pass but allow retake. List in detail any qualification imposed upon the student:
Retake date _____ (one time only)

4. Fail. Terminate from program.

Major Advisor

Committee Member

Committee Member

Committee Member

Committee Member

**PROFESSIONAL DEVELOPMENT REQUIREMENT
(Ph.D. Program only)**

Name of Student: _____

Major Advisor: _____

Lecture Requirement

Lectures Given: _____

Course: _____

Dates: _____

Faculty mentor: _____

OR

Fellowship Application Requirement

Date Application Submitted: _____

Funding Source: _____

Major Advisor

Date

Committee Member

Date

Committee Member

Date

Committee Member

Date

Committee Member

Date

APPLICATION FOR 699-799 FUNDS

Name of Student: _____ Date Submitted: _____

Program: MS Ph.D. Phone: _____

_____ Email: _____

Prospectus is on file in the PDBio Department Office: Yes No

Course Outline is on file in the Graduate School Office: Yes No

Research Title: _____

What percent of your data collection is completed? _____

What percent of your thesis/dissertation writing is completed? _____

When do you plan to graduate? _____

Total amount requested: _____

Please itemize your specific budget requests:

Major Advisor: _____ (Print) _____ (Signature)

Total amount awarded: _____
Authorized Signature: _____ Date: _____

REQUEST FOR STUDENT TRAVEL

Please Submit to Your Committee Chair

Name of Student: _____ Date: _____

Email address: _____ Phone number: _____

Name of conference or appropriate activity: _____

Destination: _____

Dates of travel: _____

Departmental Account (for office use): _____

Cost Sharing Account: _____

If graduate student, have you filed your prospectus? Yes No

Title and author(s) of paper to be presented or justification of how this travel will enhance your professional development (please use reverse side of paper if needed):

Budget	Projected Cost	Actual Cost (office use only)
Air Far		
Car Rental		
To/From airport		
Motor Pool Vehicle		
Personal Vehicle		
Meals		
Lodging		
Registration		
Other		
Total		

Major Advisor: _____

(Print)

(Signature)

Signature of Departmental Travel Coordinator: _____ Date: _____
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MS GRADUATE PROGRESS REVIEW

Name of Student _____ Date _____

Program: PDBio Neuroscience

Part Ia

*To be completed by the student **prior** to the Progress Review and then submitted to the Advisory Committee at the time of the Review.*

1. Please mark under your current semester of enrolment if you have completed each of the items listed below. Indicate date, if completed this semester.

Semester	1 st	2 nd	3 rd	4 th	5 th or more
Current Enrolment					
Program of Study					
Prospectus					
Course Work Oral Exam					

2. Any item not completed above (exclude gray areas) indicate expected completion date (Should be within 30 days).

3. If you were accepted on provisional basis, have you completed the provisions?

4. What is your program GPA? How many credit hours have you completed?

5. List the classes you are currently taking.

Part Ib

6. What labs have you worked in during the last year?

7. List your research accomplishments; attach copies of any abstracts or publications in the last year.

8. When do you anticipate you will be completing your degree?

9. What obstacles do you face in completing your program?

10. What are your goals for the next year?

*(Committee completes **Part II** on back)*

Part IIa

To be completed and signed by the Chair and Committee following review.

- After meeting jointly with the student (at least once a year), or
- After meeting individually with the student,

The Committee Recommends:

- Satisfactory progress and continuance in the graduate program (Mark only if Part Ia2 is blank).
 - 30 day marginal progress*
 - University marginal progress
 - Unsatisfactory progress
- } (complete Part IIb)

Signatures:

Committee Chair or Rotation Advisor	Date	Member	Date
Member	Date	Member	Date
Member	Date	Member	Date
Department Graduate Committee		Date	

*Mark 30 day marginal if Part 1a2 date is within 30 days.

Part IIb

Please detail below the conditions/requirements that must be finished if student is to receive a Satisfactory progress report at the next review in 30 days or in one semester. Note that Satisfactory progress requirements include both deficiencies for the current semester AND expectations for the next.

I have read and understand these conditions/requirements _____
Signed by student Date

*30 Day Marginal Completion Date: _____

PhD GRADUATE PROGRESS REVIEW

Name of Student _____ Date _____

Program: PDBio Neuroscience

Part Ia

*To be completed by the student **prior** to the Progress Review and then submitted to the Advisory Committee at the time of the Review.*

1. Please mark under your current semester of enrolment if you have completed each of the items listed below. Indicate date, if completed this semester.

Semester	1 st	2 nd	3 rd	4 th	5 th or more
Current Enrolment					
Program of Study					
Prospectus					
Comprehensive Exam					

2. Any item not completed above (exclude gray areas) indicate expected completion date (Should be within 30 days).

3. If you were accepted on provisional basis, have you completed the provisions?

4. What is your program GPA? How many credit hours have you completed?

5. List the classes you are currently taking.

Part Ib

6. What labs have you worked in during the last year?

7. List your research accomplishments; attach copies of any abstracts or publications in the last year.

8. When do you anticipate you will be completing your degree?

9. What obstacles do you face in completing your program?

10. What are your goals for the next year?

*(Committee completes **Part II** on back)*

Part IIa

To be completed and signed by the Chair and Committee following review.

- After meeting jointly with the student (at least once a year), or
- After meeting individually with the student,

The Committee Recommends:

- Satisfactory progress and continuance in the graduate program (Mark only if Part Ia2 is blank).
 - 30 day marginal progress*
 - University marginal progress
 - Unsatisfactory progress
- } (complete Part IIb)

Signatures:

Committee Chair or Rotation Advisor	Date	Member	Date
Member	Date	Member	Date
Member	Date	Member	Date
Department Graduate Committee		Date	

*Mark 30 day marginal if Part 1a2 date is within 30 days.

Part IIb

Please detail below the conditions/requirements that must be finished if student is to receive a Satisfactory progress report at the next review in 30 days or in one semester. Note that Satisfactory progress requirements include both deficiencies for the current semester AND expectations for the next.

I have read and understand these conditions/requirements _____
Signed by student Date

*30 Day Marginal Completion Date: _____