

GRADUATE STUDENT HANDBOOK



CELL BIOLOGY & PHYSIOLOGY

LIFE SCIENCES

BRIGHAM YOUNG UNIVERSITY

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BYU

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I. ORGANIZATION OF DEPARTMENT

The Department of Cell Biology and Physiology is one of seven departments in the College of Life Sciences. Within the department there are approximately 22 full-time faculty and staff members, 450 undergraduate majors, and 20 graduate students. Graduate degrees at the MS and PhD level are offered in Cell Biology and Physiology. Graduate Faculty members are listed below:

A. CELL BIOLOGY AND PHYSIOLOGY GRADUATE FACULTY

Adams, Jason, Associate Teaching Professor (2019). BS, Brigham Young University 1999; DC Palmer School of Chiropractic 2003; MS, Boise State Univ. 2008; Ph.D. BYU 2012. Teaching interests are Human Anatomy, Human Physiology, Human Embryology, Medical Imaging and Developmental Biology.

* **Arroyo, Juan A.**, *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 Preeclampsia.

* **Barrott, Jared J.**, *Associate Professor* (2023): BS BYU-I 2006, MS BYU 2008, PhD Duke University, Huntsman Cancer Institute 2017. An interdisciplinary approach is used to design and test novel personalized approaches for treating rare bone and muscle cancers called sarcomas. Novel anticancer therapies can be tested in a variety of cancer models found in the Barrott lab including cancer cell lines, 3D tumor organoids, and genetically engineered mouse models. Using the genetic profiles of cancers, Dr. Barrott can understand the unique features of these cancers that differentiate themselves from normal tissue and exposing a vulnerability where targeted therapies can work.

* **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.**, *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., *Teaching Professor & Dpt. Chair* (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.

* **Edwards, Jeffrey G.,** *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.

* **Gonda, Amber,** *Assistant Professor* (2023): BS, BYU, 2004; University of Nevada, Reno, 2010; MS, Loma Linda University, CA, 2013; PhD, Loma Linda University, 2018. Cancer Biology. Improve the ability to visualize gastrointestinal tumors at all stages of development. Facilitate diagnoses at earlier and more manageable stages of disease; enable regular monitoring of cancer progression and therapy response for more timely and accurate interventions.

* **Hansen, Jason M.,** *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.

* **Hill, Jonathon T.,** *Associate 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.

* **Jenkins, Timothy G.,** *Associate Professor* (2019): BS, BS Brigham Young University 2008; Ph.D. University of Utah, 2013. Understanding the male gamete and its contributions to fertility, normal embryogenesis and offspring health beyond the delivery of the paternal DNA blueprint. Also focusing on epigenetic signatures in the sperm that can be modified (and corrected), throughout an individual's lifetime by exposure to various agents, adherence to a specific lifestyle (unhealthy, sedentary, etc.), and even through natural aging.

* **Mizrachi, Dario**, *Associate Professor* (2017): BS and MS University of Santiago, Chile, 1995. PhD Hebrew University of Jerusalem, Israel 2002. Integral membrane proteins (IMP) represent 30% of our genome. IMPs exchange information with the environment and build barriers to preserve and protect us. Mizrachi laboratory has engineered molecular tools to make the study of IMPs more approachable and successful. We primarily focus on cellular junctions and their role in physiology, neurophysiology, & pathology.

* **Parrish, Ryley**, *Assistant Professor* (2022). BS. Auburn University Montgomery, 2007; PhD, University of Alabama Birmingham, 2014. The lab is focused on the study of epilepsy, including the mechanisms of seizure propagation and termination. The lab also studies a phenomenon known as cortical spreading depressions, which are associated with both seizure termination and migraines. Finally, the lab is working to understand the mechanisms of pharmacoresistant, prolonged seizure activity. The lab uses electrophysiology, optogenetics, live network imaging, and computer programming to address our biological questions.

* **Reynolds, Paul R.**, *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.

* **Stark, Michael R.**, *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**, *Associate 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.

* **Taylor, Seth**, *Assistant Professor* (2023): BS, BYU 2008; PhD, Yale University, 2014. Confocal microscopy, single-cell RNA sequencing, and cellular neuroscience.

* **Thomson, David M.**, *Associate Professor* (2008): BS BYU 1999, MS, BYU 2001, Ph.D., East Carolina University, 2005. The primary research focus of the lab is the effect of old-age and diabetes on skeletal muscle metabolism, mass and function. We are particularly interested in the molecular signaling pathways [e.g. AMP-activated protein kinase (AMPK) and mechanistic target of rapamycin (mTOR)] that are important in the control of muscle growth, and how those pathways are affected by various stimuli such as exercise, damage, inflammation, diet, obesity and inactivity.

* **Woodbury, Dixon J.**, *Professor* (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.

* **Yorgason, Jordan T.**, *Assistant Professor* (2018): AS Utah Valley University 2004; BS, Brigham Young University 2008; Ph.D. Wake Forest University Baptist Medical Center 2013; Postdoc Vollum Institute 2016. Neural Circuitry Underlying Drug Seeking Behavior focusing on three different brain areas all involved in the transition from initial drug use to habitual drug seeking: the basolateral amygdala, ventral tegmental area, and striatum. Electrophysiological, electrochemical, functional imaging and behavioral approaches are used to better understand drug use disorders.

* May serve as Committee Chair for CELL Graduate Students

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 gradstudies.byu.edu). The following summarizes some of that information and adds departmental requirements that are supplementary to the catalog.

A. Application Procedure

A person applying to either of the MS or PhD degree programs should apply online at: <https://gradstudies.byu.edu/section/prospective>. 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 PhD degree programs, although they may apply for the MS programs. There is an application addendum required summarizing the student's interest, fit, and desire to conduct research with *at least* 5 specific faculty members in the CELL program.

B. Standardized Tests

While not required, Doctoral and Master's applicants are highly encouraged to furnish Graduate Record Examination (GRE) scores (preferred), or scores from another national standardized exam (e.g., 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 one of the following exams with a minimum score as given below. TOEFL is preferred.

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)
E3PT	79 (21 in Speaking, Reading, and Listening, & 16 in Writing).

C. Prerequisites

Research experience is strongly encouraged before entrance into one of our graduate programs. It is advised that a research mentor write one of the applicant's 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). Students lacking one of these courses may be accepted conditionally, contingent upon successful completion of the missing course during the first semester in the program.

Prerequisites for MS and PhD in Cell Biology and Physiology
Cell or Molecular Biol. (e.g. CELL 360 or MMBIO 240 or equivalent) Biochemistry (e.g. Chem 481 or equivalent) <u>Two or more of the following:</u> Physiology with lab (e.g., CELL 362, 363 or equivalent) Developmental Biology (e.g., CELL 382 or equivalent) Genetics (e.g., PWS 340 or equivalent) Physics (e.g. Physics 105, 106 or equivalent)

D. Application Deadlines

The **completed** application must be received by the deadlines listed below.

Degree	Submission deadline*	Departmental decision	Expected date for student notification	Earliest start date**	Usual start date
PhD	Jan 15	Feb 1	Feb 15	Spring	Fall
MS	Feb 15	March 15	April 1	Spring	Fall

*Date by which all application materials must be submitted to have application be considered as complete. Submit at Graduate Studies website (<https://gradstudies.byu.edu/section/prospective>).

** International students must begin Fall Semester

E. Acceptance Criteria

Before acceptance, applications are screened by the Department Graduate Committee, and approved by the Department Faculty, Chair, and BYU Graduate Office. The following items are considered in the evaluation of each application to the Department of Cell Biology and Physiology for entrance into the MS or PhD program:

- Grade Point Average in upper division classes over last 60 semester hours (3.0 minimum)
- Scores on national standardized examinations
- Specific grades in science and math courses (including the listed prerequisite courses; see section I.C, above)
- Letters of Recommendation (one from a research mentor, if available, that highlights the applicants ability to do high level research)
- Letter of Intent (containing field of interest and career goals)
- Application Addendum summarizing interest level, likely fit, and desire to conduct graduate research with *at least* 5 specific faculty members in the Department of Cell Biology and Physiology
- Availability of a graduate student position 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

This section outlines what financial support is provided to graduate students by the department and how to apply for additional funds.

Teaching and Research Assistantships

a) MS Students

The department does NOT guarantee financial support for MS students. However, they may be funded through research assistantships (RA) from external funds obtained by the lab and/or the Principal Investigator they are working with. If such funds are not available, they are eligible to apply for financial support from the department, primarily in the form of teaching assistantships (TA). The department awards these TAs to MS students based on their qualifications, performance in the program, and the availability of positions. RAs are also available through various university programs and provide the same level of support as a TA while allowing the student to work full time in the research lab. Usually, department RA support is limited to *no more* than a single semester (or 2 terms) of support during the entire MS students time in the program. MS students may also receive up to \$1000 per semester for tuition for up to four semesters (F,W; two years), depending on the availability of funds. Additional tuition monies may also be available from the department during Spring and/or Summer Terms, but are not guaranteed. Departmental financial support beyond the second year may be considered for MS students when funds exist, but will be lower priority than for students in their first and second years.

b) PhD Students

PhD students are generally guaranteed four years of financial support in the form of stipends earned as Teaching Assistantships (TA) or Research Assistantships (RA) for Fall, Winter, and Spring/Summer. The student's Research Advisor is encouraged to provide at least 1/3 of this support through external monies. Four years of full tuition support is also provided for PhD students. Departmental financial support beyond the fourth year may be considered for PhD students when funds exist.

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. 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 their Committee Chair including transportation,

registration, housing, food, and other expenses (form D-5, available from the Department Graduate Program Manager)

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	
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 https://gradstudies.byu.edu/page/research-presentation-award	Typically Feb 1 and Oct 1
DEPARTMENT AWARDS	
TUITION SCHOLARSHIPS: The Department awards several tuition scholarships yearly to graduate students. Most awards provide half tuition for one semester. These funds come from the Ted & Della Hanks Scholarship and Cell Biology and Physiology Scholarship . Scholarships are awarded based on academic and laboratory performance to students engaged in research within the Department. Applications can be obtained from https://lsscholarships.byu.edu/UserLogin?returnurl=%2f . For additional information, contact the Department Graduate Program Manager.	Feb 1
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.	One month before the start of each semester
699-799 RESEARCH FUNDS: (Form D-4) \$300 - \$400/year for research related expenses (lab supplies, necessary software, etc). Must submit Prospectus in advance.	No deadline. Submit early in calendar year.
TRAVEL AWARD: About \$600 per student per year is available for travel to present graduate research at a national/international conference. Submit request to your faculty mentor.	At least one month before travel date.

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 minimum 3.0 GPA and be registered for *at least* 6 hours per semester or 1 hour per term (if last semester of study: 2 hours per semester and 1 hour per term).

III. **INFORMATION FOR NEW GRADUATE STUDENTS**

A. General Information

These guidelines have been prepared for the graduate student in Cell Biology and Physiology and must be used in conjunction with those in the BYU Graduate Catalog. The BYU Graduate Catalog can be found online at

<https://gradstudies.byu.edu/section/current>.

Keeping Current

Graduate students must keep current on changes made each year in the graduate program at both the Department and University levels. The ultimate responsibility to comply with all department and university requirements rests with the student. To request an exception see the Graduate Program Manager. Petitions must be approved by the Student's Advisor, Department Graduate Coordinator, Department Chair, and College Dean.

Financial Assistance

The department strives to provide substantial financial support to all graduate students. This is usually in the form of teaching assistantships (TA) and research assistantships (RA). Typically, PhD students retain first priority for RA positions, but on occasions, RA positions are available to MS students *once* during their MS program. The Graduate Coordinator and Graduate Program Manager make TA assignments, and specific requests to TA a particular course should be submitted by email to the Graduate Program Manager four weeks prior to each semester/term. Prior to making the request, the student should make arrangements with faculty teaching the course they wish to TA. Additional financial assistance is also available as described in section II.F.

B. Lab Rotations and Mentor Selection

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

MS Students

There will be no laboratory rotations required, if the student has selected a mentor before starting their MS program. However, if a student does not have a mentor selected, then they may do laboratory rotations (CELL 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 in the MS program. Once an MS student decides on a mentor, no further rotations are required. Since our MS program is designed to be approximately 2 years in duration, the selection of a Research Advisor should be completed no later than the end of the first semester.

PhD Students

PhD students must enroll in 3 laboratory rotations (2 credit hours each for a total of 6 credit hours of CELL 649R) during their first year of graduate study. If the student has not identified a mentor before starting the program, these rotations will provide exposure to faculty research interests, and allow for the identification of an appropriate mentor. Once a formal mentor has been selected (either before entering the program or before the completion of all three rotations), the student should consult with them in determining whether to perform the remaining rotations in the mentor's laboratory. Even if a mentor has been determined, rotations may be performed to gain experience with certain methodologies and/or applicable models for future work in the students graduate project.

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 and making the arrangements for rotation laboratories. The student may consult with the graduate committee or other faculty members in deciding which laboratories to include.

C. Advisory Committee and Program of Study

The student's Advisory Committee and course outline are established by the same means. Submit at <https://gradprogress.sim.byu.edu>. In cooperation with their Research Advisor, the student should select committee members and a program of study appropriate to their graduate program. Advisory 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.

Procedure for Committee Selection

The student should clear Advisory Committee names with their Research Advisor. They should then contact each member individually and ask them to be on the Advisory Committee. This is the responsibility of the student, not mentor. Advisory Committee members are a valuable resource to help students successfully complete their graduate program. As such, Advisory Committee members should have a clear rationale for inclusion. This can include any aspect of the graduate program but is most beneficial if Advisory Committee members assist with the students research, such as methodologies required for completion, expertise in a specific field, etc. An initial committee meeting should be scheduled soon after the student establishes a tentative course outline with their Research Advisor. If the student wants a graduate faculty member from another university to be on their committee, they must fill out a Petition for

Exception stating their 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)	4 (minimum)

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

Program of Study (Course Outline)

The student should consult with their Research Advisor about their Program of Study and work with them to determine which elective courses are best suited for their time in the program. The university and departmental requirements for MS and PhD programs are listed in the sections below (see III.D and III.E). However, significant latitude is allowed within these requirements for individually tailored graduate programs, but should still be related to the basic mission of a graduate degree within the Department of Cell Biology and Physiology. A typical Program of Study should not exceed the graduate requirements (see below) by more than 8 credits and must be justified. Restrictions on the number of courses to be taken is to help students have protected time in the lab to complete the research portions of their degree. The Advisory Committee and Graduate Program Manager must approve the final Program of Study. The student should fill out a trial Program of Study form and have it with them when they first meet with their Advisory Committee. Submit to Graduate Program manager at <https://gradprogress.sim.byu.edu/> for review and committee's final approval.

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. This form must be submitted in time in order to maintain status as an active graduate student. If necessary, changes can be made by filing a change form signed by the Advisory Committee and Graduate Coordinator.

Program	Absolute Deadline
MS	End of 1 st semester
PhD	End of 2 nd semester

D. University Requirements

BYU stipulates the following minimum standard for graduate programs:

Credit Hours

a) MS

- The minimum requirement is **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 the student's course outline, a Petition for Exception is required for approval

b) PhD

- 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.

Transfer Credit

Transfer Credit (or credit requested for classes taken but not counted in any previous degree program) should be graduate-level courses 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

Minimum Registration

The minimum registration for all active graduate students is 6 hr/semester until all didactic courses are completed, after which only 2 hr/sem is acceptable.

Note that registration is not necessarily required during spring or summer term, but, 1) the University will terminate the graduate status of any graduate student that does not take *at least* 6 hr/academic year, and 2) during the final semester or term in which the student graduates, they must be registered for a minimum of 2 hours. There may be additional circumstances (e.g., if the student is receiving student loans) that necessitate other registration requirements.

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.

Interrupted Graduate Program

Students who desire to interrupt their graduate program at BYU must complete and have pre-approved for re-admittance either:

- a. GS form 13 (for missionary, military, or medical reasons)

OR

- b. GS form 6 (for students who are dropped for not maintaining continuous registration)

The student should meet university conditions as provided on the instructions and as explained in the University's Graduate Catalog under "Readmission". These forms are available from the Dept. Graduate Program Manager or from <https://gradstudies.byu.edu/page/form-list>. 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.

Prerequisite Classes

Students are expected to have taken all or all but one of the prerequisite classes (or equivalents). These classes are listed above in the table under section II.C. Any deficiencies should be made up during the first full semester, if not feasible, the student will work with the Research Advisor/Committee to petition the Graduate Committee to design a plan for completion of prerequisites at a later date. Please note that prerequisite deficiencies will not count toward credits required for a student's degree but are still part of the student's Program of Study.

Seminar/Presentation Requirement

MS and PhD students are required to present one seminar on their research or research interests each year to the department. Typically, presentations are part of CELL 694R. All graduate students, even if not enrolled, are expected to attend weekly seminars (CELL 696R) throughout their time in the program. Seminar attendance is recorded and *at least* 80% attendance is required for a passing grade.

MS in CELL

Required Coursework (note that some of these courses may be offered as 550R or 650R courses until renamed at a later date):

	Course	Title	Credit Hours	Notes
Core Knowledge 3 Credit	CELL 660	Graduate Cell Biology	3	
	CELL 662	Graduate Physiology	3	
Conducting Research 6 Credit Hours	CELL 570	Responsible Conduct of Research	1	
	PWS 633 (preferred) OR Stat 511	Statistics	3	
	CELL 649R	Laboratory Research or Rotation	4	Credit for initial two semesters of lab work
Communicating Science 14 Credit Hours	CELL 610	Scientific Communication	1	Course on effective science writing (grant & manuscript) & speaking (oral and poster). Held block 1 of first fall semester in program.
	CELL 692R	Current Science Discussions	2	A student-led, faculty-mentored "casual" journal club meeting. Held block 2 of every fall semester in the program. Students should attend throughout their time in the program.
	CELL 694R	Research Presentation	2	0.5 credits per fall/winter semester; to be taken every semester in the program
	CELL 696R	Graduate Seminar	2	0.5 credits per fall/winter semester; to be taken every semester in the program
	CELL 699R	Masters Thesis	6	Credit for work on the Masters Thesis and Defense
State of the Field: Department Faculty Modules or Interdisciplinary Courses (electives)			6	Minimum of 4 credits (~2 modules) of CELL State of the Field modules required; the remaining 2 credits can be from CELL modules or other graduate courses offered across campus.
Total Credits:			33	

PhD in CELL

Required Coursework (note that some of these courses may be offered as 550R or 650R courses until renamed at a later date):

	Course	Title	Credits	Notes
Core Knowledge 6 Credit	CELL 660	Graduate Cell Biology	3	
	CELL 662	Graduate Physiology	3	
Conducting Research 10 Credit Hours	CELL 570	Responsible Conduct of Research	1	
	PWS 633 (preferred) OR Stat 511	Statistics	3	
	CELL 649R	Laboratory Research or Rotation	6#	Credit for initial three semesters of lab work
Communicating Science 28 Credit Hours	CELL 610	Scientific Communication	1	Course on effective science writing (grant & manuscript) & speaking (oral and poster). Held block 1 of first fall semester in program.
	CELL 689R	Practicum in Life Sciences Teaching	2	Experience in teaching a life science course.
	CELL 692R	Current Science Discussions	4	A student-led, faculty-mentored "casual" journal club meeting. Held block 2 of every fall semester in the program. Students should attend throughout their time in the program.
	CELL 694R	Research Presentation	4	0.5 credits per fall/winter semester; to be taken every semester in the program
	CELL 696R	Graduate Seminar	4	0.5 credits per fall/winter semester; to be taken every semester in the program
	CELL 799R	Doctoral Dissertation	18#	Credit for work on the dissertation and Defense
State of the Field: Department Faculty Modules or Interdisciplinary Courses (electives)			10	Minimum of 6 credits (2-3 modules) of CELL State of the Field modules required; the remaining 4 credits can be CELL modules or other graduate courses offered across campus.
Total Credits:			59	

#Research credit (CELL 649R & 799R) may not exceed 27 hours.

F. Suggested Coursework Map for CELL Grad. Programs

MS	PhD
<p style="text-align: center;">Fall Semester (9 CH)</p> <p>CELL 610: Scientific Communication (1) CELL 649R: Laboratory Research (2) CELL 660: Graduate Cell Biology (3) CELL 692R: Current Science Discussions (1) CELL 694R: Research Presentation (0.5) CELL 696R: Graduate Seminar (0.5) Electives or missing prerequisites (2)</p> <p>Funding: TA (if available) File Program of Study</p>	<p style="text-align: center;">Fall Semester (10 CH)</p> <p>CELL 610: Scientific Communication (1) CELL 649R: Laboratory Research (2) CELL 660: Graduate Cell Biology (3) CELL 692R: Current Science Discussions (1) CELL 694R: Research Presentation (0.5) CELL 696R: Graduate Seminar (0.5) Electives or missing prerequisites (2)</p> <p>Funding: RA</p>
<p style="text-align: center;">Winter Semester (8 CH)</p> <p>CELL 570: Responsible Conduct of Research (1) CELL 649R: Laboratory Research (2) CELL 662: Graduate Physiology (3) CELL 694R: Research Presentation (0.5) CELL 696R: Graduate Seminar (0.5) Electives (2)</p> <p>Funding: TA (if available) File Research Proposal</p>	<p style="text-align: center;">Winter Semester (9 CH)</p> <p>CELL 570: Responsible Conduct of Research (1) CELL 649R: Laboratory Research (2) CELL 662: Graduate Physiology (3) CELL 694R: Research Presentation (0.5) CELL 696R: Graduate Seminar (0.5) Electives (2)</p> <p>Funding: TA (prep for future teaching practicum) File Program of Study</p>
<p style="text-align: center;">Spring/Summer (2 CH)</p> <p>CELL 699R: Masters Thesis (2)</p> <p>Funding: RA from Lab (where available)</p>	<p style="text-align: center;">Spring/Summer (2 CH)</p> <p>CELL 649R: Laboratory Research (2)</p> <p>Funding: RA</p>
<p style="text-align: center;">Fall Semester (9 CH)</p> <p>CELL 692R: Scientific Readings (1) CELL 694R: Research Presentation (0.5) CELL 696R: Graduate Seminar (0.5) CELL 699R: Masters Thesis (2) PWS 633: Statistics (3) Electives (2)</p> <p>Funding: TA (if available)</p>	<p style="text-align: center;">Fall Semester (11 CH)</p> <p>CELL 689R: Practicum in LS Teaching (2) CELL 692R: Scientific Readings (1) CELL 694R: Research Presentation (0.5) CELL 696R: Graduate Seminar (0.5) PWS 633: Statistics (3) Electives (4)</p> <p>Funding: RA Qualifying Exam: Complete and File Dissertation Proposal</p>
<p style="text-align: center;">Winter Semester (3 CH)</p> <p>CELL 694R: Research Presentation (0.5) CELL 696R: Graduate Seminar (0.5) CELL 699R: Masters Thesis (2)</p> <p>Funding: RA Defend Thesis</p>	<p style="text-align: center;">Winter Semester (5 CH)</p> <p>CELL 694R: Research Presentation (0.5) CELL 696R: Graduate Seminar (0.5) CELL 799R: Doctoral Dissertation (2) Electives (2)</p> <p>Funding: RA</p>
	<p style="text-align: center;">Spring/Summer (2 CH)</p> <p>CELL 799R: Doctoral Dissertation (2) Qualifying Exam: Comprehensive Knowledge Examination</p>

	<p>Subsequent Fall Semesters (5 CH)</p> <p>CELL 692R: Scientific Readings (1) CELL 694R: Research Presentation (0.5) CELL 696R: Graduate Seminar (0.5) CELL 799R: Doctoral Dissertation (3)</p> <p>Funding: RA (unless TA is desired)</p>
	<p>Subsequent Winter Semesters (4 CH)</p> <p>CELL 694R: Research Presentation (0.5) CELL 696R: Graduate Seminar (0.5) CELL 799R: Doctoral Dissertation (3)</p> <p>Funding: RA (unless TA is desired)</p>
	<p>Subsequent Spring/Summer (2 CH)</p> <p>CELL 799R: Doctoral Dissertation (2)</p>

*TA=Teaching Asst., RA=Research Asst.

Course Offerings: <https://gradstudies.byu.edu/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 the graduate student will meet with their Advisory Committee *at least* twice per year (Fall and Winter Semesters) 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.)

Performance Evaluation

To meet federal and university requirements (see below), departments evaluate academic performance of graduate students twice annually. Three categories can be reported: *Satisfactory*, *Marginal*, or *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 terminate any student that receives two sequential evaluations that are less than *Satisfactory*.**

- Number of evaluations required **the first year** of a student's graduate program are according to the semester that the student was admitted:
 - Fall admits: 2 evaluations
 - Winter admits: 1 evaluation (2 evaluations every academic year thereafter)
 - Spring or Summer admits: 0 evaluations (2 evaluations every academic year thereafter)

Evaluation Form D-6 (see forms at the appendix) must be filed at the end of each fall and winter semesters. Performance evaluations are the responsibility of the graduate student, including setting up Advisory Committee meetings, meeting deadlines and filling out the proper paperwork/forms.

- **Because the Department of Education requires students to maintain satisfactory progress toward completing their degree in order to receive financial aid, students who receive an unsatisfactory rating or do not receive an evaluation will not be eligible to obtain financial aid.**
- **Evaluations will be recorded. Failure to enter evaluations may result in the student being denied federal financial aid.**
- Two unacceptable ratings will have the following consequences:

- If a student receives a marginal and an unsatisfactory or two unsatisfactory ratings in succession the university will:
 - Terminate the student's program at the conclusion of the semester (NOTE: A report that includes the names of students with two unacceptable evaluations will run September 30th, January 30th, and May 30th. A termination letter will be sent to these students unless Graduate Studies receives a Petition for Exception from the student's department.)
- If a student receives a marginal rating in one semester and is not making satisfactory progress in the next semester, the student must be rated as making unsatisfactory progress. In other words, a student may not be rated as making marginal progress in two sequential semesters. Failing to correct marginal progress is unsatisfactory.
 - Departments will specify what constitutes satisfactory, marginal, and unsatisfactory progress in their handbooks (see below for list) and will inform students of the rating process and the consequences of the ratings.
 - In the case of marginal or unsatisfactory progress, communication will be received. This will list requirements that the student must fulfill, time deadlines for those requirements, and the faculty whom the student should contact for information or help.
- Marginal progress may include the following:
 - Failure to submit Program of Study.
 - Failure to establish a graduate committee.
 - Registering for thesis hours when little or no work has been done.
 - Failure to submit an approved thesis/dissertation prospectus.
 - Minimal contact with chair or advisory committee members.
 - Prospectus or thesis/dissertation draft not approved.
 - Limited progress toward courses and requirements on Program of Study.
 - Poor performance in clinical/externship/applied experience.
 - Poor performance in research.
- Unsatisfactory progress may include the following:
 - Grade in a course falling below B-.
 - Failure to complete Program of Study.
 - Failure to establish a graduate committee.
 - Failing a course.
 - Registering for thesis hours when little or no work has been done.
 - Failure to submit an approved thesis/dissertation prospectus (qualifying exam).
 - Failure of comprehensive exams.
 - Minimal or no contact with chair or advisory committee members.
 - Prospectus or thesis/dissertation draft not approved.
 - Lacking progress toward courses and requirements on Program of Study.
 - Poor performance in clinical/externship/applied experience.
 - Rated as marginal in previous review and has not remediated weak areas.
 - Concerns about ethical or professional behavior.
 - Poor performance in research.
 - Failure to resolve any problems or fulfill any requirements indicated in a previous marginal or unsatisfactory review.

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 Dean of Graduate Studies.

B. Research Project

All graduate students are expected to complete a significant and publishable research project. While publication is not a requirement for graduation, it should be strongly considered as a goal of your research efforts. Publications demonstrate the quality and outcomes of your research.

Selection of Research Project

The student is expected to originate and plan their own specific research project that will be acceptable to their Advisory Committee. This is done by coordinating with your Research Advisor. If the student's interests are not commensurate with the capabilities, interests, and funding of their advisor, they should select another advisor or change their research plan as necessary.

MS Program

Students in the MS program will work with their Research Advisor to select a research project that is significant and appropriate in scope and rigor for a masters thesis. Please note that novel research should originate while enrolled as a graduate student in our graduate program and should not be simply a continuation of mostly completed work prior to matriculation. After selecting a research project, the student will provide a prospectus to their Advisory Committee *at least* 2 weeks prior to formally presenting their proposal with their Advisory Committee and one member of the Department Graduate Committee. With their approval, the student then files the Approval of Research Proposal form for approval at <https://gradprogress.sim.byu.edu/>. Their prospectus should be sent to the Graduate Program Manager to be included in their graduate file as a record of this event. This should be done by the end of the 2nd semester at the latest.

PhD Program

Students in the PhD program will work with their Research Advisor to develop a research project that is significant and appropriate in scope and rigor for a doctoral dissertation. After selecting a research project, the student will provide a prospectus to their Advisory Committee *at least* 2 weeks prior to formally presenting their proposal with their Advisory Committee and one member of the Department Graduate Committee. With their approval, the student then files the Approval of Research Proposal form for approval at <https://gradprogress.sim.byu.edu/>. Their prospectus should be sent to the Graduate Program Manager to be included in their graduate file as a record of this event. After filing the Approval of Research Proposal form, students

become eligible for additional types of financial assistance, as described in section II.F. After selecting the project, the student will prepare for and pass the Qualifying Exam, as described below in section III.C.

If the student's research emphasis changes more than in a minor way after a proposal is approved, the student must submit a new approved proposal as well as a 2 page rationale regarding changes from their original proposal to the Department as soon as possible, and no later than one semester after the original due date.

Periodic Review of Research

Periodic meetings with your Advisory Committee should be held *at least* twice 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 regarding the research project; however, most detailed problems should usually be worked out with your Research Advisor.

C. Examinations

MS Program

a) Oral Defense of Thesis

Each student must defend his/her thesis before their Advisory Committee in a public seminar (can be in lieu of the required yearly seminar). At <http://gradprogress.sim.byu.edu> select "Ready for Defense". **A minimum of 2 weeks prior to the Presentation of Thesis—No Exceptions! Submit thesis in final form** with complete data, graphs, and content to the same link (See Graduate Program Manager for complete list of dates and steps). At that time it is expected that the Advisory Committee will have already been 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. In order to have Advisory Committee input, it is suggested that students give their thesis to their Advisory Committee members *at least* 2 weeks prior to selecting ready for defense (a total of 4 weeks prior to the defense date). Although the thesis presentation is open to the public, only members of the Advisory Committee may vote on the student's performance.

PhD Program

a) Qualifying Examination

Students in the Ph.D. program must pass the qualifying examination in order to advance to Ph.D. candidacy. The purpose of this exam is to assess the student's capability in conducting graduate research within their specific field

and to obtain Advisory Committee approval to proceed with their research project. This approval is an official statement by the department that completion of the proposed project will be sufficient for a dissertation. The proposal 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 rigor, and (3) has sufficient training and resources to appropriately perform and analyze the experiments. This exam consists of two parts, a written dissertation research proposal and an oral defense of the dissertation proposal/prospectus.

WRITTEN DISSERTATION PROPOSAL/PROSPECTUS: The written proposal should be prepared as a NIH NRSA F31 fellowship proposal (or equivalent, as determined by the student's Advisory Committee. NRSA F31 fellowships are 6 pages single spaced, not including references, 0.5 in. margins, 11-point Arial font). Preliminary data is not required. The student should begin working with their mentor to define a project as soon as possible after a mentor and lab have been identified. This proposal is the student's work, not that of the student's Research Advisor. **Although students may seek input on their proposal from others, they are responsible to write the document in its entirety. Sections lifted from other documents, including work from the Faculty Advisor (sections of a grant, publication or previous work) is NOT acceptable. Faculty advisors may read, discuss and suggest edits for grammar, spelling, clarity and style, but may not prepare *de novo* any part of the document.** The finalized proposal should be submitted to the student's Advisory Committee and the department Graduate Coordinator in final form **at least 2 weeks prior to the oral defense**. The proposal should then be submitted to the NIH or other granting agency unless the student is not eligible to do so (e.g., non-US citizen, etc).

ORAL DEFENSE OF DISSERTATION PROPOSAL/PROSPECTUS: This meeting will be scheduled and conducted by the student's Research Advisor. The student will give an oral presentation of their proposed research to their Advisory Committee **and a representative from the department Graduate Committee who is not part of the regular Advisory Committee**. This meeting should include rationale for the project, significance, innovation, overarching hypotheses, methodologies and experimental design, potential problems and expected results. Generally, proposals are broken up into specific aims, which in most cases, are related but stand alone projects. After the presentation, the student will then field questions from their Advisory Committee and the Graduate Committee representative regarding

the proposed work and general scientific knowledge relevant to the proposal's field of research. **Students should complete this portion of the exam before the end of the 3rd semester (typically the end of the fall semester of their 2nd year in the program).** This meeting should last *no more* than 3 hours.

Once the oral defense of proposal is passed, a final copy (with content revisions if requested by the Advisory Committee or Departmental Graduate Committee member), of the proposal should be submitted to <http://gradprogress.sim.byu.edu>. It is due by the end of the third semester in the program for PhD students. Students who have not filed on time lose priority for departmental funding, may be dismissed if more than one semester late, and/or will receive a University Marginal or Unsatisfactory on their progress review. Also, submit a copy to the Graduate Program Manager.

b) Comprehensive Knowledge Examination

The purpose of this examination is to assess the student's understanding of and ability to communicate the basic, broad principles of cell biology and physiology. It consists of a written and oral component. Both portions are scheduled and conducted by the department Graduate Committee.

WRITTEN COMPREHENSIVE EXAM: The written comprehensive exam will be held during the spring term at the end of the student's 2nd year in the program on a date scheduled by the Graduate Committee.

The exam is a 4-hour closed-book exam in which the student will answer 4 essay questions. The student will choose 2 of 3 available questions from the core courses (Cell Biology and Physiology) and 2 of 3 available questions from other related areas, such as Biochemistry, Genetics, Molecular Biology, etc. (mostly from prerequisite classes that are related to Cell Biology and Physiology). Grading of the exam will be pass/fail, and will be performed by a committee consisting of the professors who wrote the selected questions and two representatives from the department Graduate Committee. Each examiner is to evaluate on total performance and not merely on those questions which he/she asks.

ORAL COMPREHENSIVE EXAM: The comprehensive oral exam will be held 2-3 weeks after the comprehensive written exam. It is a 1 to 2-hour closed-book examination which will consist of oral questioning of the student by an examination committee consisting of two Graduate Committee members and two other graduate faculty (that are not the Research Advisor). Questions will

be asked on any topics relevant to the student's research and/or cell biology and physiology as it pertains to the project.

Upon satisfactory completion of both examinations, the Chair submits form D-3 "Evaluation of Examination" to the Department Graduate Program Manager.

c) **Dissertation Defense**

Each student must defend his/her dissertation before their Advisory Committee in a public seminar (can be in lieu of the required yearly seminar). At <http://gradprogress.sim.byu.edu> select "Ready for Defense". **The written dissertation must be provided a minimum of 2 weeks prior to the Dissertation Defense (no exceptions!)** This should be a final version with complete data, graphs, and content, and is submitted to the same link (See Graduate Program Manager for complete list of dates and steps). At that time it is expected that the Advisory Committee will have already been involved in reviewing the dissertation, and that the members of the Advisory Committee and the student will have resolved matters of dissertation content, format, sentence structure, table and figure organization, etc. In order to have Advisory Committee input, it is suggested that students give their dissertation to their Advisory Committee members *at least 2 week* prior to the deadline for the department (see above). Although the dissertation presentation is open to the public, only members of the Advisory Committee may vote on the student's performance.

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 proposal forms the basis for the introduction section of the Thesis/Dissertation. The exact content of the Thesis/Dissertation is set at the discretion of the student's Advisory 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.

Format Requirements

Exact requirements for format are set by the Department of Cell Biology and Physiology and are described in: "Minimum Standards for Submitting Dissertations, Theses, or Selected Projects." This guide can be obtained from The Department Graduate Program Manager or online at: <https://gradstudies.byu.edu/page/form-list> . Please review this in detail *BEFORE*

you begin writing. It will save you time and effort. 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. These will be submitted in chapters.

Review and Approval

Meet with the Department Graduate Program Manager for a list of all submission steps.

- a) Schedule Defense with the Department Graduate Program Manager. This must be completed a **minimum of four weeks prior to your examination** and within the University time limit.
- b) Submit an electronic copy of your thesis/dissertation (including all ancillary pages), 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 <http://gradprogress.sim.byu.edu> for review by each member of your Advisory Committee. Email a copy of the same to the Graduate Program Manager. This must be completed a **minimum of two weeks prior to your defense**.
- c) 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.a).
- d) After working on formatting revisions and final changes, submit an electronic copy of the thesis/dissertation in final form to the Department GPM.
- e) Submit a request for bound copies. See GPM.
- f) PhD students complete Survey of Earned Doctorate. Forward receipt to GPM.
- g) Complete an Exit Interview with Department Chair. Schedule with GPM

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 (including Reading Days). It is the responsibility of the student to make sure the committee members will be available.

MS Students

Event	Due Date	Form*
Advisory Committee Selection and Program of Study	End of first semester	Gradprog
Thesis research plan presented to Advisory Committee	End of second semester	D-1
Application for graduation	Before department/college/university deadline	Gradprog
Scheduling of thesis defense and submission of thesis to department	<i>At least 2 weeks before thesis defense</i>	Gradprog
Thesis defense	Before department/college/university deadline	See GPM
Submission of final thesis	Before department/college/university deadline	Gradprog

PhD Students

Event	Due Date	Form*
Advisory Committee Selection and Program of Study	End of second semester	Gradprog
Qualifying Examination	End of third semester	D-1
Comprehensive Examination	Spring following 4 th semester	D-3
Application for Graduation	Before department/college/university deadline	Gradprog
Scheduling of dissertation Defense and submission of dissertation to department for reading	Before department/college/university deadline	Gradprog
Dissertation Defense	Before department/college/university deadline	See GPM
Final dissertation to Graduate Program Manager	Before department/college/university deadline	
ETD	Before department/college/university deadline	Gradprog-8d
Doctoral Survey & UMI	Before department/college/university deadline	

*Gradprog = Online D = Department form (available from Dept. Grad Program Manager)

F. Program Transition from MS to PhD

On occasion, exceptional MS students may wish to transition to our PhD program. First and foremost, Research Advisor support must accompany this decision and an official letter of support is to be provided. The current MS project must be expanded significantly to demonstrate the scope and rigor of a PhD project. As such, students transitioning into the PhD program will be required to provide a new prospectus with revised aims that is indicative of a PhD project that will be approved by the Advisory

Committee and a member of the Department Graduate Committee. This should *not* just make the current MS project more robust but should provide new aims (3 in total) that can be connected scientifically but should be distinct, individually testable and more expansive.

To transition into a PhD program, current MS students will apply internally to the PhD program on the dates outlined in section I.B (see above). MS students will be re-considered for admission with other, new PhD applicants for that yearly admission cycle (due in February). If admitted, the earliest official MS transition to PhD can occur will be in the Spring term of that application year.

Student Health Resources

Many resources are available to help students manage health concerns that may arise. These resources include, but are not limited to, the following:

Student Health Center: 1750 N. Wymount Terrace Dr., Provo. 801-422-2771

University Accessibility Center: 2170 WSC. uac.byu.edu

Counseling & Psychological Services: 1500 WSC. caps.byu.edu

Counseling and Group Therapy

Biofeedback Services

Stress Management

Title IX: 1085 WSC

titleix.byu.edu

Domestic/Dating Violence or Assault

Crisis Resources:

Univ. Police: 801-422-2222

Utah County Crisis Line: 801-691-5433

Text Line: Text HOME to 741741

help.byu.edu

V. SAMPLE FORMS

A. University Forms (available online)

The following university forms are available from the Dept. Graduate Program Manager and may also be printed online at: <https://gradstudies.byu.edu/page/form-list> .

B. Departmental Forms

Examples of departmental forms are included on the following pages. They are available from the Dept. Graduate Program Manager.

APPROVAL OF QUALIFYING EXAM

Name of Student

Date Approved

Research Advisor

Committee Member

Committee Member

Committee Member

Committee Member

EVALUATION OF COMPREHENSIVE EXAMINATION

Name of Student: _____ Date of Exam: _____

Major Field: _____ Research 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.

Research Advisor

Committee Member

Committee Member

Committee Member

Committee Member

APPLICATION FOR 699-799 FUNDS

Name of Student: _____ Date Submitted: _____

Program: ☐ MS ☐ Ph.D. Phone: _____
Email: _____Prospectus is on file in the CELL Department Office: ☐ Yes ☐ NoCourse Outline is on file in the Graduate School Office: ☐ Yes ☐ NoResearch 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:

Research Advisor: _____
(Print) (Signature)

Total amount awarded: _____

Authorized Signature: _____ Date: _____

MS GRADUATE PROGRESS REVIEW

Name of Student: _____

Date: _____

Program Start Date: _____

Anticipated Graduation Date: _____

PART I. *To be completed by the student prior to the Progress Review Meeting and then submitted to the Advisory Committee at the time of the Review Meeting. Reviews are to be held a minimum of twice per year (every 5-7 months).*

A. Program Progress

1. Under your current semester of enrollment, indicate the date of completion for program requirements. All requirements should be completed by the semester indicated with an unshaded (recommended) or lightly shaded (acceptable) box.

Semester	1st	2nd	3rd	4 th +
Current Enrollment (due each semester)				
Program of Study (due by the end of the 1st semester)				
Research Plan/Prospectus				

2. For any unshaded item not completed during your current semester of enrollment, indicate the expected completion date (should be within 30 days of the review meeting).
3. If you were accepted on a provisional basis, have you completed the provisions?
4. Current program credit hours completed and GPA:

B. Current Performance

In the last 6 months:

Hours/week of research-related activity		Percent attendance at seminar/GRP	
Hours/week of classroom activity		Publications (attach abstract)	
Hours/week of teaching activity (TAing)		Professional presentations (attach abstract)	

1. Research obstacles and accomplishments**2. Has your prospectus changed? If so, attach a 2 pg written summary of changes, including rationale.****3. Goals for the next 6 months**

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

Part II To be completed by the Committee Chair following the Review, signed by the Advisory Committee, and submitted by the Chair to the Graduate Coordinator. **A member of the Department Graduate Committee should be present at the Review Meeting at least once per year.**

Was marginal or unsatisfactory progress determined in the previous progress review? ☐ Yes ☐ No

If so, have the associated stipulations (Part III) been appropriately addressed? ☐ Yes ☐ No

The Committee Recommendation:

- ☐ Satisfactory progress, continuance in the graduate program
- ☐ Departmental marginal progress (30 days to rectify or status will change to "University Marginal") See below Part III
- ☐ University marginal progress
- ☐ University unsatisfactory progress

Signatures:

_____ Research Advisor	_____ Date	_____ Member	_____ Date
_____ Member	_____ Date	_____ Member	_____ Date
_____ Member	_____ Date	_____ Member	_____ Date
Did a member of the Department Graduate Committee attend this meeting? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, who? _____			
_____ Graduate Coordinator	_____ Date		

PART III *If the recommendation is marginal or unsatisfactory the committee should list below the actions that need to be taken by the student to remedy the issues and to make it likely that a satisfactory evaluation will be obtained within 30 days or at the next progress review, as applicable. Be specific and include required date(s) required for completion of the criteria. Be aware that two sequential unacceptable (university marginal or unsatisfactory) ratings will result in termination from the program. **If the recommendation is "Satisfactory" the committee should list 1-2 focus areas for continued improvement.***

I agree with the terms described above.

Signature of Graduate Student's Advisor Date

Signature of Graduate Student Date

PhD GRADUATE PROGRESS REVIEW

Name of Student: _____

Date: _____

Program Start Date: _____ Anticipated Graduation Date: _____

PART I. *To be completed by the student **prior** to the Progress Review Meeting and then submitted to the Advisory Committee at the time of the Review Meeting. **Reviews are to be held a minimum of twice per year (every 5-7 months).***

C. Program Progress

1. Under your current semester of enrollment, indicate the date of completion for program requirements. Light-shaded boxes indicate the possibility for early completion, but are not required.

Semester	1st	2nd	3rd	4th	5 th +
Current Enrollment (due each semester)					
Program of Study					
Prospectus (due 3rd semester)					
Comprehensive Exam (due 4th semester)					

2. For any unshaded item not completed during your current semester of enrollment, indicate the expected completion date (must be within 30 days of the review meeting).

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

4. Current program credit hours completed and GPA:

D. Current Performance

In the last 6 months:

Hours/week of research-related activity		Percent attendance at seminar/GRP	
Hours/week of classroom activity		Publications (attach abstract)	
Hours/week of teaching activity (TAing)		Professional presentations (attach abstract)	

1. Research obstacles and accomplishments

2. Has your prospectus changed? If so, attach a two page written summary of changes, including rationale.

3. Goals for the next 6 months

Part II To be completed by the Committee Chair following the Review, signed by the Advisory Committee, and submitted by the Chair to the Graduate Coordinator. **A member of the Department Graduate Committee should be present at the Review Meeting at least once per year.**

Was marginal or unsatisfactory progress determined in the previous progress review? ☐ Yes ☐ No
 If so, have the associated stipulations (Part III) been appropriately addressed? ☐ Yes ☐ No

The Committee Recommendation:

- ☐ Satisfactory progress, continuance in the graduate program
- ☐ Departmental marginal progress (30 days to rectify or status will change to "University Marginal") See below Part III
- ☐ University marginal progress
- ☐ University unsatisfactory progress

Signatures:

Research Advisor	Date	Member	Date
Member	Date	Member	Date
Member	Date	Member	Date
		Did a member of the Department Graduate Committee attend this meeting? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, who? _____	
Graduate Coordinator	Date		

PART III *If the recommendation is marginal or unsatisfactory the committee should list below the actions that need to be taken by the student to remedy the issues and to make it likely that a satisfactory evaluation will be obtained within 30 days or at the next progress review, as applicable. Be specific and include required date(s) required for completion of the criteria. Be aware that two sequential unacceptable (university marginal or unsatisfactory) ratings will result in termination from the program. **If the recommendation is "Satisfactory" the committee should list 1-2 focus areas for continued improvement.***

I agree with the terms described above.

Signature of Graduate Student's Advisor	Date
Signature of Graduate Student	Date

VI. ADDENDUM

Guide to Writing a Prospectus

Department of Cell Biology and Physiology

This *brief* guide is provided to help you in writing either your M.S. or Ph.D. prospectus required by the Department of Cell Biology and Physiology. In addition, it is recommend you carefully review the document *How to write a scientific article* (Hoogenboom and Manske, 2012), which gives much additional advice.

1 What exactly is a Prospectus?

The prospectus is, in brief, a *research proposal*. It is written to gain approval to carry out the M.S. or Ph.D. project that is required to satisfy the qualifications to receive your respective degree. In defining the scope of your project, an approved prospectus becomes “contract” between you and your committee. As such, your prospectus will work to your advantage, so that you know when you have completed the outlined work, and to the committee’s advantage, so they know what they are expecting to see upon the completion of your project. Please note that committees recognized that you may change directions along the way, but with a well outlined prospectus in hand you have a place to start and an idea where to stop.

Because the prospectus is written before most of the research work is done, a primary goal of this document is to sell your ideas and plans, showing that your idea has merit. You must convince your graduate committee that

- Your project addresses an important, novel problem in an appropriate way.
- You have adequate preparation and a plan to solve the problem in a reasonable amount of time.

The *audience* you should be targeting is your graduate committee, a small group of professors. They should be handpicked to understand general scientific concepts involved in your project that could include, but are not limited to, methodologies, data analysis, experimental models, etc. However, please note that not all committee members are, nor do they need to be, experts in your subfield, and so will need to be given the appropriate background material to understand the terminology and theory specific to your project. They may need to be told what is common knowledge in your subfield and what is new and innovative about your work.

2 Prospectus Content

Below is the general order of topics that is recommended, along with a suggested length for each item for a Ph.D. prospectus. The Ph.D. prospectus should contain 20-28 pages (not including bibliography); an M.S. prospectus should be half this length.

1. Introduction (1.5 pages)

- (a) Give a brief background of your field of work, identify a problem, and establish the problem's importance. This is your opportunity to generate interest in the audience about your project. Avoid using highly technical jargon at this point and don't make this part longer than 1 page.
- (b) State the scope of your project. Your objective must be *narrow* and *specific*: do not just say you will work on *X* or study subject *Y*. Instead provide a scientific hypothesis that you will test or research questions you intend to answer, and briefly outline the tools and methods you will use. What is the anticipated impact of your work, if successful, on your field?
- (c) Outline the topics that are covered in the remainder of the document, i.e. give a road map.

2. Background (around 10 pages, with a subsection for each topic)

Do a more extensive background discussion on the problem, showing you have a good grasp of the field in which you are working. You are preparing your audience to understand the novel and intricate nature of the problem and to appreciate the value of your proposed solution in item 4 below. Extensive experimental details or equations on basic procedures (e.g. a protein assay, quantifying DNA in a nanodrop, etc.) are not appropriate in a research-proposal type of document.

This section includes your "literature review," though don't name it as such. In particular, describe where other's prior work overlaps with your proposed work, showing ideas you can gain from them or knowledge gaps that need to be filled. A Ph.D. prospectus should reference at least 30 prior works, and an M.S. about half that—some references are more important and will deserve individual and critical analysis, while other references can be lumped together as part of a discussion of related works that address a particular issue.

3. Prior Results (around 2 pages)

Give prior results generated by you, showing a few quantitative or qualitative results to demonstrate you know how to get started and have been able to overcome a couple early hurdles. You do not need to show everything you have done—the purpose is to establish your credibility in carrying out the proposed

research, not to provide the same level of detail that would be found in an academic publication. Prior results provide evidence that the work on which you will embark has merit and is possible. The best preliminary results are those that you yourself generate. However, you may use other preliminary data from other sources as well. If you choose to do so, please explain how your results may be different or similar to those that you did not generate personally. You will want to show competency in your plan.

4. Methods and experimental design and work plan (around 8 pages, with a subsection for each task)

In this section, please outline specific methods that you will use to perform your project. Please note that this information should include the most important aspects of your project experimentally. You should include specific approaches and describe how they will help to answer your central question/hypothesis. These are the most important methodologies that are critical for the success of your project. Methods that are routinely used do not require a full description here.

List the tasks that are required to answer your hypotheses or questions, giving detail on the technical challenges you anticipate and how you plan to overcome those challenges. In brief, what challenges do you anticipate? In doing so, make sure to

- Provide the logic guiding your choice of tasks, so that the reader can see why the proposed activities are the best means of answering your questions.
- Help the committee to distinguish your unique contribution to the field by explicitly identifying ideas that are new to your work as opposed to ideas that originated with others.
- Make your plans specific. Figures and tables illustrating the proposed experimental design(s) are quite helpful. For instance, you can list parameters you will hold constant and parameters that will be changed (with a range of values) in your experiments or models.
- Give alternative paths (i.e. backup plan) if your original research plan is not successful.
- State how you will maintain laboratory safety.

5. Timeline (0.5 page)

Give a timeline chart summarizing the tasks and steps that will lead to completion of dissertation or thesis, including the specific papers you plan to write and publish. This section will give the committee an idea of how feasible this project is.

6. Bibliography (2 or more pages)

Give a list of cited references, numbered in the order they first appeared in the main document. Numbers are preferred as they take up less space in the body of the text. Use a consistent number format taken from a scientific journal in your field.