

College of Agriculture and Bioresources

Department of Food & Bioproduct Sciences

FACULTY AND CURRENT M.AGR., M.SC. AND PH.D. STUDENT HANDBOOK

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TABLE OF CONTENTS

| Introduction | 4 | |
|---|----|--|
| You are herenow what? | 5 | |
| History of the Department | 6 | |
| Faculty and Departmental Resources | | |
| Faculty | 7 | |
| Health & Safety | 8 | |
| Prep Room | 8 | |
| Safety Supplies & Equipment Information | 8 | |
| Occupational Health and Safety Committee | 8 | |
| Safety Courses | 9 | |
| Best Practices | 9 | |
| Disposal of Hazardous Waste | 10 | |
| Glassblowing | 10 | |
| Facilities and Services | 11 | |
| Department Space | 11 | |
| Office & Laboratory Space | 11 | |
| Secure Locker Storage | 11 | |
| Equipment Use and Availability | 11 | |
| Departmental Lab Equipment | 12 | |
| Reading Room and materials | 14 | |
| Campus libraries | 15 | |
| General Office and Supplies | | |
| Financial Related Matters | | |
| Mail | | |
| Telephones | | |
| Photocopying | 17 | |
| Computing | | |
| Keys | | |
| Parking | | |
| Registration for Graduate Courses | | |
| Requirements for M.Agr. Degree | 21 | |
| Requirements for M.Sc. Degree | 22 | |
| Requirements for Ph.D. Degree | 23 | |
| Information for Transfer Students Between Masters' Programs | | |
| Information for Transfer Students from M.Sc. to Ph.D. | 24 | |

| The Research Supervisor and Advisory Committee | 25 |
|---|----|
| Meetings | |
| Writing a Graduate Thesis and Project Report | |
| Publications | |
| Intellectual Property Policy | |
| Academic Integrity | |
| College of Graduate and Postdoctoral Studies Graduating Student Checklist | |
| Seminars | |
| Student Grievances, Appeals and Discipline | |
| Financial Assistance | |
| Vacations and leave of absence | |
| Graduate Students' Association | |
| FABS Social Calendar | |
| Scientific Societies | |
| Contact Information | |
| Q&A | |
| Appendix A. Guidelines | |



The Agriculture Building on the University of Saskatchewan campus. (Photo Credit: University of Saskatchewan)

INTRODUCTION

The mission statement of the Department's graduate programs is to provide a high-quality, challenging and intellectually stimulating graduate program experience.

Welcome to the Department of Food and Bioproduct Sciences and congratulations on your acceptance to our graduate program. We are a unique Department in that we host several programs at the P.G.D., M.Agr., M.Sc. and Ph.D. levels. We have administrative responsibility at the undergraduate level for both the FABS specialization in the B.S.A. program and the College of Arts and Science B.Sc. (Food Science) program. In addition, students in B.Sc. Microbiology, the pre-veterinary program, and the Division of Nutrition and Dietetics take several of the Department's undergraduate courses. At the graduate level, the Department currently offers P.G.D., M.Agr., M.Sc. and Ph.D. programs in either Food Science or in Applied Microbiology. These graduate programs train students in the applied and basic sciences using an array of cutting edge molecular, industrial and traditional techniques. Our graduates are highly qualified personnel in high demand by academic, research and industrial organizations. They are recognized members of the scientific community for their achievements and continue with the tradition of excellence that they acquired through the Department.

This Handbook is intended to serve as a guide to graduate studies in the Department of Food and Bioproduct Sciences (FABS) at the University of Saskatchewan, by summarizing the rules, regulations, procedures and practices that apply. It complements the on-line material provided by the College of Graduate and Postdoctoral Studies (<u>http://www.usask.ca/cgps/</u>) which you should review for the most up-to-date information regarding your graduate program.

There are a number of policies, or codes of usual practice which our department employs. Your time in graduate studies is a period of freedom during which you should become fully immersed in your discipline and experience a growing professional awareness and confidence. In order that you maximize potential benefits from your program, both you and the department must make commitments. The department provides you with the intellectual, physical and often financial assistance required. You must take advantage of these opportunities by being highly motivated to study and by directing it in the most productive manner possible. The policies and information outlined in this Handbook are to assist you in achieving these objectives. At the end of this handbook are some general Q&A which might be helpful.

Thanks to the many people who have contributed to this handbook over the years. This is a "living" document. It will be updated from time to time to reflect changing policies and the needs of graduate students and supervisors. Students and faculty are encouraged to provide input to keep this document current and relevant.



Some Current Food & Bioproduct Sciences Graduate Students 2015

YOU ARE HERE ... NOW WHAT?



WILLKOMMEN BIENVENUE ようこそ добро пожаловать **BEM-VINDO**

By now you should have received the following:

- an offer of admission letter from Graduate Studies,
- your NSID (you should have received this when you submitted your application) and,
- a confirmation of employment offer (or project supervision offer for M.Agr. students) from your supervisor either by formal letter or email (see Q&A at end if not)

Your NSID will be critical for you to get set up as it is required for payroll, registration to academic and safety courses, access to on-campus computer systems and to obtain a student card and library services.

M.Sc. and Ph.D. students: Generally on your first day here, you will be shown around by your supervisor to your new laboratory environment, introduced to fellow graduate students and you will be brought to the front office and Graduate Programs Office for introductions.

M.Agr. Students: Generally on your first day here, you will meet the supervisor, Graduate Chair and the FABS Office and Graduate Programs Office staff. In the visit to the supervisor and Chair, you will discuss your program of study (POS). You should discuss your interests and your direction in future with the supervisor prior to your arrival in Saskatoon, and they will show you the possibilities of course choices in this meeting. Soon after, typically within the first week of your study, an advisory committee meeting is called (which will include your project supervisor) and your Program of Study will be confirmed.

It is in the Graduate Programs Office visit where you will be required, if applicable, to complete some payroll/ employment forms to be returned to the Graduate Programs Assistant. These need to be done as soon as possible to avoid any delay in payment. As part of getting you set up as a graduate student receiving a stipend, you will also need to provide copies of the following documents where they apply for our records*:

- 1. your study permit,
- 2. your social insurance number

*These records are all kept locked and with strictly restricted access for your protection.

HISTORY OF THE DEPARTMENT

The department was established as the department of Dairy Husbandry in the College of Agriculture in 1913. Undergraduate teaching and extension programs to support the production and distribution of milk and milk products in the province were the major functions in the early days. In 1952 the name of the department was changed to Dairy Science, but until the early 60's the objectives remained the same. Following relocation of facilities from the basement of the Administration Building to the newly constructed John Mitchell Building in 1951, when the dairy plant became available, students received a theoretical and practical education in the production and processing of milk. Courses offered included the manufacturing of products such as ice cream and butter, with a strong emphasis on microbiology because of the perishability of these products. The department was responsible for courses in introductory microbiology, dairy microbiology, and soil microbiology until 1958, when the latter courses were transferred to the Department of Soil Science. Significant research began in the 50's which was primarily directed towards the improvement of Saskatchewan dairy products and the development of new products. The bound collection of departmental reprints, which is available in the General Office, illustrates the range of work carried out in those early days. At the same time, there was a strong commitment to extension work benefiting the dairy industry and close ties to government programs in the dairy field. In 1936, a quality control laboratory was established in the department which, until 1986, carried out chemical and microbiological analyses of milk and milk products from the northern part of the province on behalf of government and industry.

A number of developments occurred in the 60's and 70's involving the expansion and redirection of programs. In keeping with changes occurring at other North American universities, the program in dairy science was broadened to include food science. This involved a greater emphasis on the scientific aspects of food composition and processing and consideration of a much wider range of products. To reflect this development, the name of the department was changed in 1968 to Dairy and Food Science. A food science group involving members of several departments and colleges was organized in the College of Graduate and Postdoctoral Studies and an interdisciplinary food science graduate program was introduced in 1976. The dairy plant was closed in 1978 but research, quality control and extension relating to dairy products remained important aspects of the department's activities. There was also a significant expansion and broadening of interests in microbiology and in 1968 an agricultural microbiology option was introduced in the undergraduate program. The general level of graduate training and research activity in the department increased markedly.

Since 1980 further expansion and development has occurred, initially in response to a decision by the university to support a thrust in biotechnology centered in the department. Additional resources were provided and a major renovation of space was undertaken; the name of the department was changed, yet again, to Applied Microbiology and Food Science in 1982. Closer ties were forged with the Department of Microbiology and some members of government and private sector research organizations were appointed to adjunct professor positions in the department. There was a further strengthening of graduate training and research, including the introduction of new graduate courses and the establishment of significant new research areas, in both food science and applied microbiology. In 1984, a decision was made by the university administration to support further consolidation and expansion of food science in the department. An external review of the food science program was carried out in 1988; the Interdisciplinary Food Science Graduate Program was subsequently discontinued and administrative responsibility for graduate studies in food science was assigned to the department in 1989. In 1991 the department moved to new facilities in the Agriculture Building. In 2007, the department made another name change to better align itself with the themes that extend beyond applied microbiology and include new and innovative products and commodities from agricultural and other resources becoming the Department of Food and Bioproduct Sciences. We continue to build on the excellence we inherited throughout our history as measured by our research funding and our scholarly or patent outputs.



Pictured Department Heads from 1976 - 2011

In 2010, former and current Department Heads, representing 34 years of Department Headship were together at our Annual International potluck luncheon.

Left to right: Dr. Graham Jones, Dr. Bob Tyler, Dr. Nicholas Low, Dr. Eiler Humbert, Dr. George Khachatourians

FACULTY AND DEPARTMENTAL RESOURCES

FACULTY

A current list of the names and research interests of the faculty who are members of the department or associated with it may be found at our departmental website <u>http://www.agbio.usask.ca/faculty-and-staff/food-and-bioproduct-sciences.php</u>

Our Department spans a variety of expertise and disciplines including, but not limited to:

| Value-added Crop Utilization | Novel Techniques to Detect Food Adulteration |
|---|--|
| Mycology, Microbial Biotechnology and Bioproducts | Food Nanotechnology |
| Food Enzymology | Meat Quality |
| Nutrigenomics | Biotechnology |
| Food and Environmental Microbiology | Protein Quality and Utilization |
| Carbohydrate Quality and Utilization | |



<u>2019 Faculty</u> Front row left to right: Dr. P. Shand, Dr. X. Qiu. Middle row left to right: Dr. B. Tyler, Dr. N. Low, Dr. V. Vujanovic Back row left to right: Dr. S. Ghosh, Dr. C. Eskiw, Dr. M. Nickerson, Insets: Dr. Y. Ai (left), Dr. D Korber (Department Head; middle), Dr. T. Tanaka (Graduate Chair; right)

HEALTH & SAFETY

The Preparation Room, 4E29 Agriculture Building

This facility is supervised during working hours by Dr. Adrienne Woytowich. Keys to the preparation room have been issued to each laboratory in the department, in an attempt to prevent unrestricted access. Three autoclaves are housed in this room and are accessible to the members of the College however there are strict regulations and practices in place to ensure the safest and most efficient use of this equipment. New staff and students **must** attend an orientation session delivered by the department laboratory coordinator/safety officer <u>prior</u> to using the preparation room. If you require use of this facility during evenings or weekends you will need to obtain permission from your supervisor and you will be responsible for the security and clean up of the area.

Each laboratory is responsible for their own wash up and disposal of biological waste. If your laboratory wishes to use the automatic dishwashers they must be trained by Adrienne on how to use them correctly. When autoclaving biological waste it is each labs responsibility to discard the cooled biohazard bags into the large green bins located in the Prep Room and to rinse out the trays. If trays need to be soaked overnight they can be left beside the sink and cleaned the next morning. Autoclaved glassware must be removed promptly, rinsed and washed by each individual.

Be constantly aware of the hazards posed by chemical or biological agents that could harm personnel handling your wash-up and discard materials. All materials should be handled using "Universal" precautions. For example, prerinse all glassware and double rinse glassware that has contained strong acids or bases. When working with radioactive material, the user should wash contaminated glassware within the proper laboratory setting and use disposable scintillation vials. Glassware contaminated with radioactive substances is not allowed in the prep room.

Safety Supplies, Equipment and Information

- First-aid kits and chemical spill kits for acids, bases, mercury and solvents are available in the preparation room (4E29), the teaching laboratories (4E65 and 3E75) and all "wet" laboratories in our department. There is also a departmental spill clean-up kit located in 3E75 (under the stainless steel counter) that contains: a respirator with cartridges, heavy vinyl gloves, apron, goggles, plastic bags and a scoop, all contained in a 20 L pail. Gloves, goggles and aprons suitable for spill cleanup are also available in 4E29. A respirator mask is available at Agriculture Stores (1E26.1).
- Become aware of the location of emergency showers, eyewash stations, fire extinguishers and fire alarms.
- Request assistance from trained personnel in your area before using a fumehood or biological safety cabinet.
- **Safety Data Sheets** for chemicals are readily available in the file cabinet by Agriculture Stores (1E26.1). Requests for SDS's at other locations on campus may be readily obtained from the storekeeper. Xerox copies may be reproduced for your laboratory file if desired. In 3E75, there is a binder containing SDS's for all the biological (<u>http://www.phac-aspc.gc.ca/msds-ftss/index-eng.php</u>) and chemical (<u>http://ccinfoweb.ccohs.ca/msds/search.html</u>) agents stored in that lab.
- **Standard Operating Procedures** (SOPs) can either be found in a binder located in the same room as the equipment or, attached to/near the piece of equipment. The SOP **must be read and signed** before proceeding to use each piece of equipment for which there is an SOP.
- Chemicals and other consumable items may be borrowed from the teaching laboratories (4E65 and 3E75) with the understanding that the **used quantities must be replaced**. Equipment may also be borrowed from these laboratories on a short-term basis, **after receiving permission** from the laboratory personnel and filling out the sign-out sheet with name, date and room number. <u>Media and chemicals located in the preproom (4E29) are to be used only for FABS 212.3.</u>
- Carts for the transport of gas cylinders are stored in Room 4E29 and 1E26.1.

Occupational Safety and Health Committee

Each department on campus has a representative on the OHS Committee, ours is **Dr. Adrienne Woytowich at 966-5033 or** <u>adrienne.woytowich@usask.ca</u>. This committee meets four times each year. If you have any problems regarding safety in your work situation, contact this representative, as well as your supervisor, for assistance.

Safety Courses

Our Department and the Safety Resources Department offer a series of courses that are at various time periods throughout the year, or as requested. You will be notified of which courses are required for your program and you will need to take these <u>prior</u> to performing any work in the laboratory. Upon completion of each course you should provide a copy of your certificate to the departmental office and update your curriculum vitae (CV).

Listed below are the courses currently offered:

| Course title | Sponsor | Mandatory |
|---|----------------------|-----------|
| | | (yes/no) |
| Radiation Safety Course to be attended by anyone contemplating work | Safety Resources | No |
| with radioisotopes. Course registration forms and licensing forms will be | | |
| submitted by your research supervisor. | | |
| Bio Safety Course (valid for 3 years) | Safety Resources | Yes |
| Laboratory Safety Course (valid for 3 years) | Safety Resources | Yes |
| WHMIS 2015 | Safety Resources | Yes |
| First Aid | St. John's Ambulance | No |
| Safety Orientation for Employees | Safety Resources | Yes |
| Safety Orientation for Supervisors | Safety Resources | Yes |
| Prep room orientation (includes autoclave usage training) | Department | Yes |

Registration:

For registration in Safety Resources courses, please go to: <u>http://safetyresources.usask.ca/</u>. You will require an NSID in order to register.

For registration in Department courses, please contact Donna Selby, Department Operations Assistant (<u>donna.selby@usask.ca</u>) or Ann Harley, Graduate Programs Assistant (<u>ann.harley@usask.ca</u>).

Best Practices

Labeling of Stored Substances

All too often, unlabeled substances are left in laboratories, which represents a potential hazard to others as well as emergency response personnel. **Please be responsible and label all substance containers immediately with your name, content and date**. "Discard after dates" should also be considered. Chemical and biological substances in long-term storage should be labeled in accordance with WHMIS requirements.

Flammable Solvents

Vented solvent storage cabinets are present in each laboratory for small quantities of solvents; quantities larger than 4L should be stored in the central facilities, 1E20.1. **Peroxidizable compounds such as ethers must be labeled with special labels available at Agriculture Stores.** It is wise to print the date received on all new bottles of solvent entering your laboratory.

Acids and Bases

Storage cabinets are present in each laboratory. Remember that oxidizing acids must be separated from organic acids; bases must be separated from acids. Inorganic bases should be stored in polyethylene containers.

Disposal of Hazardous Waste

Biological

All biological waste must be autoclaved. Covered pipette pans and disinfectants for sanitization of benches, pipette pans or culture spills are available from preparation room personnel.

<u>Chemical</u>

Never allow chemical wastes to accumulate in your laboratory. Keep a log of the amount and composition of the waste deposited in each waste container [Agriculture Stores (1E26.1) has Hazardous Waste Disposal forms and labels]. Waste containers can also be obtained from Agriculture Stores (1E26.1) but a signed requisition will be required. A Hazardous Waste Management Facility exists on campus to dispose of specific chemical waste and the central collection depot is Agriculture Stores (1E26.1).

Other Wastes

Other waste material that may be sent to the Hazardous Waste Facility includes:

- Radioactive waste. Consult your Radiation Waste Procedures Manual for specific disposal procedures.
- Sharps (i.e., needles, syringes, scalpel blades) should be autoclaved if contaminated. All sharps should be collected in a labeled plastic container with a lid. Send this container to the Hazardous Waste Facility.
- Broken uncontaminated glass will be routinely collected by the preparation room personnel to avoid accumulations in your laboratory. It is placed in a sturdy box that is sealed before disposal by the janitorial staff.

Glassblowing

A glassblowing shop providing a campus service is operated by the Chemistry Department in Room G37, Thorvaldson Building (ph 4679).



Pipetting



Dr. Shand and PhD Student Samira Dadgar



Student working in a fume hood



Dr. Adrienne Woytowich with student

FACILITIES AND SERVICES

Department Space

The department occupies the third, fourth and six floors (E wing) in the Agriculture Building. The total facilities consist of two teaching laboratories, two pilot plants, research laboratories, offices, and service space such as preparation/wash-up room, equipment room, cold rooms, common plug-and-play areas, and so on.

Office and Laboratory Space

Best efforts will be made to accommodate all M.Sc. and Ph.D. students with functional workspace within close proximity to their labs and supervisors. Each general workspace area will have a telephone (no long distance access), a live port for network connecting (and wireless connectivity), a desk, a chair, and a cabinet/file drawer for storage. Each student is responsible for maintaining a clean, respectable and efficient work space. The department does not provide individual office spaces for M.Agr. students, however, project supervisors may have some working spaces in their laboratory. General study spaces are provided in the various library locations.

Each research laboratory is under the control of a specific faculty member and any student using a laboratory is subject to the rules and regulations applying to it.

Students working in non-university laboratories are subject to all the controlling organization's policies with respect to space, equipment and other matters.

All students are responsible for the tidiness and cleanliness of their own research and bench areas. These are important criteria for the maintenance of an effective working environment, particularly for microbiological work.

Secure locker storage

The College office (2D30) provides use of lockers throughout the college free of charge. You will need to supply a lock. These are assigned on an annual basis renewable each September to retain the same locker (or a new one in a different location if required). The Department will provide secure space for your belongings (but not necessarily locked). Some supervisors *may* provide lockable storage in their working laboratory.

Equipment Use and Availability

Some equipment is purchased by the department and is available for general use, but most scientific equipment is purchased with grant funds by individual faculty members and is therefore under the control of the purchaser. It is departmental policy to maximize the use of equipment, however, since it is often not feasible for financial reasons to duplicate items. Equipment in your research supervisor's laboratory will be generally available to you, but the use of any other equipment, chemicals or facilities must be negotiated with the faculty member in control. Ingenuity, respectful dialogue, and a record of careful use of equipment become important factors in securing access to what you need.

Sometimes the department does not have a specific piece of equipment which a graduate student needs. In this case the research supervisor or a member of the advisory committee can usually advise on its availability elsewhere in the university or in one of the associated laboratories. Again, it is very important to approach the owner of such equipment correctly, and to use it responsibly, in order that the good relationships which exist on campus in regard to the joint use of equipment can be maintained.

| Ai Lab | 2x Shaking water bath (VWR) |
|------------------|---|
| 3D13, 3D13.1 and | Advanced rheometer AR 1000 (TA Instruments) |
| 3D05.2 | AE150 pH benchtop meter (Fisher Scientific) |
| | Allegra TM 21 Centrifuge (Beckman Coulter) |
| | Analytical balance (Sartorius) |
| | Centrifuge 5424 (Eppendorf) |
| | Differential scanning calorimeter (PerkinElmer) |
| | FG2002-S Balance (Mettler Toledo) |
| | Genesys 30 Visible Spectrophotometer (Thermo Scientific) |
| | HPLC, Agilent 1260 Infinity II LC System (Agilent) |
| | Isotemp incubator (Fisher Scientific) |
| | Isotemp oven (Fisher Scientific) |
| | Laboratory mill 3100 (Perten) |
| | Research-scale extruder |
| | RVA 4800 (Perten) |
| | RAV Super 3 (Perten) |
| | Titrando 888 Autottrator (Metrohm AG) |
| | Water bath (Fisher) |
| Eskiw Lab | Systems Infrastructure includes: Cell Culture, Level 1 and 2 Controlled Containment, |
| 6E23 and 6E27.1 | Equipment: |
| | |
| | Class IIB biosafety cabinet |
| | Liquid nitrogen storage |
| | preparatory and analytical electrophoresis systems for DNA, RNA and Protein |
| Korber Lab | Level 2 containment microbiological laboratory |
| 4E05 and 4E19 | -80°C ultra low temperature freezers |
| | Shaker water baths, benchtop shakers, Sorvall Omnimixer |
| | BioRad Confocal laser microscope (CLM)/Nikon Eclipse confocal microscope system |
| | Phase contrast, epifluorescence, DIC photomicroscopes |
| | Computer workstations and software for digital & video image/analysis |
| | Micro- and refrigerated high-speed floor centrifuges |
| | 2D – Isoelectric focusing & PAGE protein electrophoretic analysis |
| | 2D – DIGE (differential in-gel electrophoresis) |
| | QuBit low-volume DNA/RNA/protein quantitation |
| | Preparatory and analytical electrophoresis systems for DNA, RNA and protein synthesis, isolation and |
| | sequencing |
| | PCR, RT-PCR |
| | BioRad D-Code Denaturing Gradient Gel Electrophoresis (DGGE) system |
| | Robotic liquid handling station |
| | pH/Eh meters, spectrophotometers, fluorimeter |
| | 96-well Scanning microtiter plate reader, Microarray Reader |
| | Anaerobic chambers Class 2 Nuaire Biosafety cabinet & Fume Hood |
| T T 1 | Un campus DNA sequencing |
| LOW Lab | HPLC equipment (4 units; non-metallic mobile phase pathways for pH compatibility) with PAD (pulsed |
| 3E11, 3E/3 | ECD (electrical conductivity) |
| | PDA (photo diodo array) |
| | I for (prior under a ray) |
| | Low Pressure LC system for protein /polypentide separation and analysis (with IIV detection) |
| | Three capillary electrophoresis (CE) instruments with fixed IIV and laser-induced fluorescence (LIF) |
| | detection |
| | Proximate analysis equipment (moisture, lipid, protein, and fibre) including a micro-Kjeldahl system. |
| | Moisture by traditional forced-air oven, vacuum oven |
| | IR, and Karl-Fischer |
| | Digital refractive index system |
| | Capillary gas chromatography system with FID and TCD |
| | LC-MS (ion trap system) |
| | Photo-chemiluminescence system (for antioxidant capacity measurements) |
| | a 5th LC system (Dionex) |
| 1 | an ELSD (evaporative light scattering detector) |

Below you will find a list of some of the equipment available in our Departmental labs:

| 1 | | | |
|-----------------------|--|--|--|
| Nickerson Lab 3E13 | Malvern Mastersizer 2000 with wet dispersing cell Malvern Zetasizer with pH titrator and 90° dynamic light scattering capacity Micro-Kjeldahl digestion and distillation units Horiba Johin Yvon FluoroMax-4 Spectrofluorometer | | |
| | Lauda Automatic tensiometer Spectrophotometer | | |
| | Bio-Rad Low pressure liquid chromatography (FPLC) instrument | | |
| Qiu Lab | CFX Connext Real-time PCR System (Biorad) | | |
| 4E08, 4E19 | 7890A/5945C GC-MS System (Agilent) | | |
| | Polymerase chain reaction systems: robotic and fast cycling ones that do not have real-time capacity (Eppendorf). | | |
| | DNA/RNA electrophoresis system (Thermo Scientific) | | |
| | Protein electrophoresis system (BioRad) | | |
| | Gel-documentation system (Alpha Innovator) Refrigerated centrifuge (Eppendorf) | | |
| | Temperature-controlled incubators (37 C and 28 C, IsoTemp) | | |
| | Thermomixer (Eppendorf) | | |
| | Refrigerated shaker (Thermo Scientific) | | |
| | Water purification system (Barnstead) | | |
| | Vacuum concentrator (Eppendorf) | | |
| | Solvent heating-evaporator: for preparation of fatty acid derivatives | | |
| Ghosh Lab | Nikon eclipse E400 equipped with a Nikon DS-FiL colour camera | | |
| 4E83, 4E76 | Linkam PE94 & LTS 120 temperature controller | | |
| | Rotational rheometer (TA Instrument AR-G2) | | |
| | Vacuum ovens, Drying oven, incubators | | |
| | Haake D3, D8 water baths Brinkmann Botavanor | | |
| | Bronwill Biosonik Sonicator | | |
| | Ultrasonic bath | | |
| | Vortex mixture | | |
| | GC with Olfactory capabilities | | |
| | High Pressure Homogenizer (Avestin Emulsifiex C3) | | |
| | High-speed Polytron Blender | | |
| | Force Tensiometer (Cruss) | | |
| | Differential Scanning Calorimeter (DSC 2000, TA Instruments) | | |
| | Photocentrifuge LUMiSizer (LUM Americas) | | |
| | Vacuum ovens | | |
| | | | |
| Shand Lab | *Meat processing equipment (Grinder, vacuum tumbler, bowl chopper, Injector, stuffer, smoke house, retort | | |
| 3EU3, 3E21, 2E72 | and other thermal processing systems) * in pilot plant Equipment for most provimate analysis (protain, fat, moisture and ash) | | |
| 3673 | Equipment for lipid oxidation analysis (TBARS) | | |
| | Torsion gelometry equipment and Texture Press | | |
| | Small strain dynamic rheology | | |
| | CIE color analysis (Minolta and Hunter). | | |
| | Spectrophotometer | | |
| | Refrigerated floor centrifuge, bench ton centrifuge | | |
| | Various types and sizes of water bath, shaking water bath | | |
| | Polytron homogenizer, Rotavap | | |
| | Equipment for gel electrophoresis and Western blotting | | |
| | HPLC with fluorescence and diode array detectors | | |
| Tanaka Lab | High-speed centrifuge Sorvall RC28S (rotors: GSA, SS-34, GS-3, SA-600) | | |
| 4E03 | PCR (basic capability) | | |
| | UV photometer | | |
| | Gel documentation system (no analytical software) | | |
| | ГГЪС | | |
| | Ultrasonic cell disrupter | | |

| Vujanovic Lab | 2x Biosafety II Laminar Hood |
|----------------|--|
| 4E15, 4E19 | 2x Chemical Hood |
| | 96 well-plate gradient thermal-cycler |
| | High-performance laboratory instrument ideal for daily PCR amplification |
| | Real Time PCR and microarray scanner a platform for DNA quantification and gene expression |
| | UV Spectrophotometer |
| | Molecular Denaturing Gradient Gel Electrophoresis (DGGE) a fingerprinting system for microbial |
| | identification and assessment |
| | BioDoc-It Imaging systems |
| | DNA/RNA Electrophoresis System |
| | Robotic system DNA extraction and support for qPCR analysis of gene prevalence, expression and |
| | composition in plant, fungal and microbial ecosystems |
| | SDS-PAGE protein gels |
| | Micro- and Ultra-speed centrifuges |
| | Vacuum Pump |
| | Microscopes (fluorescence, inverted and optical) |
| | Digital microscopic camera kits |
| | Incubator/shakers, CO2 incubator for in vitro studies |
| | Incubators, xviii) Refrigerators/freezers |
| | Cryopreservation system |
| | Computer station |
| | Freeze dryer/lyophilizer equipment and barcode instruments for Saskatchewan Microbial Collection and |
| | Database |
| | Micropipettes and other basic equipment |
| | Cold chamber |
| | other preservation systems for microbial isolates and DNA. |
| Preparation | High speed centrifuge |
| Room 4E29 | Ultra centrifuge (Before using them, consult with Dr. Woytowich) |
| University | |
| Centre | |
| Saskatchewan | This centre is equipped with many instruments. They have experts to advise the utilization of these |
| Structural | instruments. Details should be referred to |
| Science Centre | https://sssc.usask.ca/ |
| (SSSC) | |

Reading Room and materials

The Department has a small reading room (Room 3E22, Agriculture Building see in picture below) containing a limited collection of books and periodicals. The key for this space is available in General Office but as a new M.Sc. or Ph.D. student, you will also be issued your own key. In addition, individual faculty members keep a number of books and journals on their shelves. Many of these are personal items but may be available for consultation on request to the faculty member concerned.



Campus libraries

The University of Saskatchewan has a total of eight libraries on campus and an abundance of on-line access to materials. To access any on-line service or material, you will require your NSID and password and in the case of hard copy materials, a student card.

Virginia Wilson is the librarian for the College of Agriculture and Bioresources. She is embedded in the College and you can find her in her office in the **Agriculture Building 2E74**. Virginia is here to help you during your graduate studies with any library-related question: searching databases, conducting a literature review, refining your research question, getting library books, choosing a reference manager, research data management, and much more.

virginia.wilson@usask.ca

Important library links:

- Library homepage: <u>https://library.usask.ca/</u> You can get to the library homepage from here or you can find a link on your PAWS page.
 Department of Food and Bioproduct Sciences (FABS) research guide: https://libguides.usask.ca/food Bioproduct
- This guide lists a host of library resources pertaining to food and bioproduct science.
 Grad Help: <u>https://libguides.usask.ca/gradhelp</u> This guide brings together resources on topics such as student/supervisor relationships, the thesis/dissertation
- process, publishing, and more.
 Grad Research Support Workshops: <u>https://library.usask.ca/studentlearning/workshops/grad-research.php</u> Throughout the academic year, the library presents workshops specifically focusing on graduate students' research needs. Check this page to keep up to date on up-coming sessions.
- Grad Writing Workshops: <u>https://library.usask.ca/studentlearning/workshops/grad-writing.php</u> Throughout the academic year, the library presents workshops specifically concentrating on graduate writing. Check this page to keep up to date on up-coming sessions.

For any library assistance during your studies, please contact Virginia: <u>virginia.wilson@usask.ca</u>. She is looking forward to getting to know you and to supporting you throughout your graduate studies at the University of Saskatchewan.



General Office and Supplies

The front office staff (Donna Selby) and graduate administration staff (Ann Harley) are knowledgeable about academic and departmental procedures, and it certainly pays graduate students to develop a good relationship with them. A good relationship will go a long way to enhancing your tenure in the department and facilitating the successful completion of your program. The office staff maintains day-to-day operations and provides support to faculty. They are also there to assist you. They deal with a host of forms and procedures which are used to keep university business flowing smoothly. In short, they are probably the most valuable people in the department concerning the kinds of things graduate students need to know. Below is a table outlining some of the principal areas of responsibility for each office staff member. Please refer to this for any inquiries you might have:

| Name/Position | Phone | Email | Duty |
|----------------|----------|--------------------------------|--|
| Donna Selby | 966-5024 | donna.selby@usask.ca | Front reception |
| Department | | | Parking validation |
| Operations | | | Key coordinator |
| Assistant | | | Photocopy account manager |
| room 3E08 | | | Meeting Room/projector bookings |
| | | | General course registration |
| Ann Harley | 966-5025 | fabs.gradstudies@usask.ca | Letters of offer and employment |
| Graduate | | or <u>ann.harley@usask.ca</u> | Devolved scholarship coordination |
| Administration | | | Program documentation |
| Assistant | | Note: If she is not available, | Scholarship/grant applications and deadlines |
| room 2D14 | | another Graduate | SiRius system administrator |
| | | Administration Assistant | Committee liaison |
| | | for the college can help | Point of contact for programs |
| | | you. Please contact Tracy | Liaison with Graduate Studies |
| | | Slywka (x4963) or Melissa | Liaison with Graduate Chair |
| | | Zink (x4145). | |

Limited amounts and types of stationery, overhead supplies, etc., are available in the office for student use, but it is departmental policy that research supervisors should provide the bulk of the stationery and graphics supplies used in research. These supplies are not to be used for students' course-related work. They need to supply their own stationary for those activities.

A laptop, projector and a laser pointer are available for loan for study purposes and may be reserved through the office staff. To maintain proper control and as a matter of courtesy, one of the front office staff members should be consulted before any office equipment or supplies are used.

Theses written by past graduate students in the department are housed in the reading room. These often serve as useful models for thesis writing and may be examined by arrangement with the office staff.



Food and Bioproduct Sciences Front office 3E08

Financial-related matters

M.Sc. and Ph.D. students: The College Finance Administration unit handles finance related matters, e.g., salary, scholarships, and so on. There are five financial analysts in the unit, and each faculty is assigned to an analyst. You can

either ask your supervisor or you can directly ask the unit (966-7498, 6828, 4042, 4944, or 8616) regarding financial matters.

M.Agr. students: The Department, College and University does not provide financial support in any form.

Mail

Each M.Sc. and Ph.D. student is assigned an individual or shared mail box in the General Office and may use the department as a mailing address. The full address is:

University of Saskatchewan Department of Food & Bioproduct Sciences 51 Campus Drive, Room 3E08 Saskatoon, SK S7N 5A8

Mail is received in the early afternoon. Outgoing mail, properly stamped if destined for an off-campus address, may be left in the office. There is a metric mail scale in the office.

Telephones

Each major work area in the department is provided with a telephone which is connected to the university's system. Saskatoon and university directories are available at each set. To call off-campus, dial "9" followed by the area code and 7-digit number; to call on-campus it is necessary to use only the 4-digit local number. All circuits other than those in the General Office and in faculty members' offices are restricted and cannot be used for long distance calls. If long distance calls related to research are necessary, they should be arranged with the research supervisor. For emergencies, you must dial 9-9-1-1 on University phones and 9-1-1 on cell phones. Also Campus Security can be reached at 5-5-5 (306-966-5555).

Use of the Photocopy Machine and Printing

The department's photocopy machine is located in Room 3E08, Agriculture Building. The machine cannot be used without entering a numerical code which will record each copy made. Graduate students each have their own code and it will be provided to you when you start your program (for M.Agr. students, it will be when they start their project, typically May). All copying related to your supervisor's research is charged to the appropriate research accounts. Departmental copying (seminar handouts and the like) must be recorded in the General Office.

Computing

Your NSID gives you access to a number of computer labs on campus.

The college has computer labs in 2D15, 3D67, 3D85 and 5C73. These are open during building hours on weekdays. The 3D67 lab is open on weekends, all the others are closed on the weekends. The "R" statistical software and SPSS are available in all of the labs, and SAS is available in 3D67. Printers are available in the labs and are charged through a central process, which is outlined on https://library.usask.ca/use-the-library/printing-and-computers/printing.php#PayingforPrinting.

Our Departmental reading room is also equipped with three computers should you need to work/register on-site any time. These computers are not reserved and are on a first-come, first-served basis. Software not available on the labs might be accessible on the campus virtual lab, vlab (<u>https://vlab.usask.ca/</u>) which is accessed through a web browser. The libraries also have computers you can use with your NSID.

Assistance with computing can be obtained through an email to itsupport@usask.ca

Keys

An outside door key and keys to rooms to which a particular student may require access are obtained through the front office; all key requests must be approved by the Research Supervisor and the Department Head. Keys usually take several days to acquire. Keys are provided to individuals and are stamped with an individual identification

number. Do not lend your keys to anyone. You will be required to sign for the keys you receive (check to see that they work) and to return them to the office when your program is completed; the university reserves the right to impose sanctions if keys are not returned.

Parking

Campus car parking space is at a premium and parking is strictly controlled. Applications for a parking spot may be made at Parking Services. There are several pay-lots and numerous meters around the campus; overstaying time at these or parking in non-designated areas is highly likely to attract a ticket and should be avoided. You can pay meters from your cell phone using an appropriate app.

iPhone: https://itunes.apple.com/us/app/paybyphone/id448474183?mt=8 Android: https://play.google.com/store/apps/details?id=com.paybyphone

REGISTRATION IN GRADUATE COURSES

| Degree or Diploma | Successful Completion | Other Requirements | Transferable to other |
|-----------------------------------|---|---|---|
| | Requirements | | program? |
| Master of Agriculture (M.Agr.) | 70% average, 24 credit units, among which at least 18 credit units must be at 800 level Complete APMC/FDSC 992 and the project report is approved by advisory committee | APMC 990, 992 or FDSC 990, 992, and GSR 960 | Yes. With the approval of their Supervisor, Advisory Committee, and Graduate Chair, students may transfer from project-based M. Agr. program to thesis-based M.Sc. program, where this option is available. |
| Master of Science (M.Sc.) | 70% average, 9 credit units at 800 level Seminars: one 20 minute, one 40 minute, and a defense | APMC 990, 994 or FDSC 990, 994, and GSR 960 | Yes, with the approval of their Supervisor, Advisory Committee, and Graduate Chair, students can be transferred to a Ph.D. program if they have completed courses in their POS and with good research progress. Also they can be transferred to project- based M.Agr. program. |
| Doctor of Philosophy (Ph.D.) | 70% in all courses, 3 credit units Seminars: two each 40 minutes in length, a comprehensive and a defense | APMC 990, 996 or FDSC 990, 996, and GSR 960 | Yes. The students can be transferred to PGD, M.Agr., or M.Sc. program with the approval of their Supervisor, Advisory Committee, and Graduate Chair. |
| Ph.D. transfer | 70% in all courses, 12 credit units (9 at M.Sc. 800-level and 3 beyond M.Sc.) Seminars: two each 40 minutes in length, a comprehensive and a defense | Same as Ph.D. | Same as Ph.D. |
| Direct Entry Ph.D. | 70% in all courses, 12 credit units at the 800 level, 9 credit units must be completed in the first year of the program Successful completion of a qualifying exam in the first year of the program Seminars: two each 40 minutes in length, a comprehensive and a defense | Same as Ph.D. | Same as Ph.D. |

Table 1: Minimal requirements for completion of M. Sc. and Ph.D. degrees

Note: Mandatory safety courses are also required as part of your program

Once you arrive to start your program, your course options for your first term will usually be discussed with your primary supervisor. Your Program of Studies (POS) will be decided during your first two to three months in the program following your initial meeting with your advisory committee. For M.Agr. students, the supervisor will communicate the general topic area to the student and confirm a general project area. The supervisor will work with graduate chair to list the potential courses for your Program of Study for first four months. The student will consult both supervisor and Chair soon after their arrival, then the first advisory committee meeting will be held within the first week of the student arrival to discuss and approve the POS.

<u>Seminar courses</u>: In addition to academic courses, all students in the department must register **each year** in a seminar course, numbered 990, <u>and</u> in the appropriate project/research course (992 for M.Agr., 994 for M.Sc., and 996 for Ph.D.). Please be sure that you are registered in the appropriate program for your degree (i.e., APMC or FDSC). Attendance is mandatory at each seminar and it is recorded.

Ethics courses: The general course, GPS 960 – Ethics and Integrity, is required for all students in their first term.

In addition to GPS 960, students may need to also take GPS 961 or GPS 962. The student's Advisory Committee will review the student's research area and determine whether or not the student needs to take GPS 961 – Ethics in Human Research and GPS 962 – Ethics in Animal Research. The Advisory Committee's determination should be recorded in DegreeWorks.

Students register for the ethics courses through PAWS as they would for any other course. They will find the CRN under the subject menu on Course Offerings Search page as Graduate and Postdoctoral Studies.

The ethics course(s) appear on the students' academic record. Deadlines to register and withdraw in the course(s) are the same as all other courses.

Most of your graduate courses will usually be discussed and agreed upon during your first and subsequent advisory committee meetings. (The minimum requirements for M.Agr., M.Sc. and Ph.D. degrees are shown in Table 1 above.) Graduate students are permitted to audit graduate (800 level) or undergraduate courses. When considering which courses to take, students are advised to investigate offerings from other units on campus, in addition to those offered by FABS. Students are advised to speak with instructors of any course under consideration, as well as to obtain course outlines, get on waiting lists, etc. Students may be given permission to add senior undergraduate courses to their Program of Study – permission is necessary so that the student is reimbursed later for the tuition fee charged for undergraduate courses.

Be aware of deadlines for registration and enrollment as special fees will be assessed for late registration and late fee payment. The registration procedure is repeated at the beginning of each academic term. Graduate students must maintain continuous registration during their programs by registering each year and a student who fails to do this is considered to have withdrawn. The fee schedule and your account status can be obtained through you PAWS account at any time.

After registration, the need to change a course may arise for various reasons. The research supervisor may give such permission for a change in registration, following consultation with the graduate chair and student's committee. This may also result in the need to update your Program of Studies.

After a Program of Studies has been approved by the advisory committee, the student is expected to fulfill all requirements of the program. Successful completion of the requirements will result in the award of the degree. Minor changes to the approved Program of Studies can be approved by your advisory committee. Major changes, such as change in supervisor or in research area, require the approval of a new Program of Studies.

REQUIREMENTS FOR M.Agr. DEGREE

Outline

- Appointment of Advisory Committee (AC), consisting of the grad chair, the supervisor (or co-supervisors), and at least one regular member, with an initial meeting held within the first two weeks (presumably in the first week).
- Initial Program of Studies (POS) defined with a minimum of 24 CU of courses at the 300, 400, and 800 level. Among 24 CU, at least 18 CU must be at 800-level. (See Table 1 for mark requirements).
- An evaluation examination will not usually be held but may be required at the discretion of the advisory committee.
- Research proposal developed, presented to and approved by the advisory committee by the end of April. (A template for the proposal is available from the Graduate Programs Assistant or on the College website.)
- Project work undertaken normally in spring/summer semesters. Upon agreement from the supervisor, the student may conduct his/her project concurrently with the course works during the fall and winter semesters.
- Completion of research.
- Submission of one examination copy of the project report to the examining committee (i.e., advisory committee). The examiners are given **2 weeks** for review of the report.
- Exit seminar and oral final report defense examination. Award of degree recommended to the Faculty of Graduate and Postdoctoral Studies.
- If, in the opinion of the advisory committee or department, a student is not making satisfactory progress with course work or research, the department may recommend that the student be required to withdraw.

REQUIREMENTS FOR M.Sc. DEGREE

Outline

- Appointment of Advisory Committee (AC), consisting of the grad chair, the supervisor (or co-supervisors), and at least one regular member, with an initial meeting held within the first four months.
- Initial Program of Studies (POS) defined with a minimum of 9 CU of courses at the 800 level. (See Table 1 for mark requirements).
- An evaluation examination will not usually be held but may be required at the discretion of the advisory committee.
- Research proposal developed and presented to advisory committee. (A template for the proposal is available from the Graduate Programs Assistant or on the College website.)
- Research work undertaken concurrently with courses.
- Completion of research.
- AC meetings to discuss research progress should be held approximately every 8 months and **must** be held at least once a year, as per CGPS rules.
- Permission to write thesis given by advisory committee and preparation of thesis in consultation with research supervisor. Guidelines of the format and style of the thesis are available from the department.
- Draft thesis approved by advisory committee.
- Submission of one examination copy of thesis to graduate secretary who will forward it to the external examiner (usually member of another unit on campus). Other copies will be distributed to the examining committee. The external examiner is given **3 weeks** for review of the thesis.
- Exit seminar and oral thesis defense examination. Award of degree recommended to the Faculty of Graduate and Postdoctoral Studies.
- Submission of one digital version of the thesis to the ETD site, and a minimum of one bound copy for the Department. Additional personal copies, as well as copies for the supervisor, should be arranged at this point.
- If, in the opinion of the advisory committee or department, a student is not making satisfactory progress with course work or research, the department may recommend that the student be required to withdraw.

REQUIREMENTS FOR Ph.D. DEGREE

Outline

- Appointment of advisory committee (AC), consisting of the grad chair, the supervisor (or co-supervisors), a cognate member, and at least two regular members and initial meeting (held within the first four months).
- Initial Program of Studies (POS) defined with a minimum of 3 CU of courses at the 800 level. A grade below 70% in any course included in the Ph.D. program is considered to be unsatisfactory, and the matter is reviewed by the advisory committee.
- Research proposal developed and presented to advisory committee. (A template for the proposal is available from the Graduate Programs Assistant or on the College website.)
- Qualifying examination within three months of arrival on campus (only for probationary students).
- Research work taken concurrently with course work.
- Comprehensive examination taken once course work has been completed, and usually at the end of year 2. On the basis of course work, research, and successful performance in the comprehensive exam, the student will be recommended for admission as a fully qualified Ph.D. candidate. A comprehensive examination must be taken by all candidates for the Ph.D. degree when the course work is essentially completed, but at least 12 months before the award of the degree is anticipated. This examination is used to assess the student's overall and disciplinary knowledge. The Department policy document with respect to comprehensives will be distributed to the student and AC committee. Generally, the areas of questioning by each AC member will be determined ahead of time, and communicated to the student. (For details regarding the comprehensive examination, please refer to Appendix A. Guidelines.)
- (FOR DIRECT ENTRY PH.D STUDENTS) POS is defined with 12 CU of courses at the 800 level. Among which, 9 CU must be taken within the first year of program.
- (FOR DIRECT ENTRY PH.D STUDENTS) Students must pass qualifying examination within the first year, preferably within the first four months. (See Transfer from M.Sc to Ph.D.)

At completion of research

- AC meetings to discuss research progress should be held approximately every 8 months and must be held at least once a year, as per CGPS rules.
- Permission to write thesis given by advisory committee and preparation of thesis in consultation with research supervisor. Guidelines of the format and style of the thesis are available from the department.
- Draft of thesis approved by advisory committee.
- Submission of two examination copies of thesis to graduate secretary who will forward it to the Dean of Graduate and Postdoctoral Studies and to the external examiner. The CGPS must be sent the necessary documentation a minimum of **six (6) weeks** prior to the desired oral defense date. After approval by the CGPS, the External Examiner must have the thesis a minimum of **four (4) weeks** prior to the defense. Other copies will be distributed to other members of the examining committee.
- Exit seminar and oral thesis defense examination.
- Award of degree recommended to the Faculty of Graduate and Postdoctoral Studies
- Submission of one digital version of the thesis to the ETD site, and a minimum of one bound copy for the Department. Additional personal copies, as well as copies for the supervisor, should be arranged at this point.
- If, in the opinion of the advisory committee or department, a student is not making satisfactory progress with course work or research, the department may recommend that the student be required to withdraw.

INFORMATION FOR TRANSFER STUDENTS BETWEEN MASTER DEGREE PROGRAMS

With the approval of their Supervisor, Advisory Committee, and Graduate Chair, students may transfer from a program with thesis to one with project, or *vice versa*, where this option is available.

INFORMATION FOR TRANSFER STUDENTS FROM MSC TO PHD

Under special circumstances, a M.Sc. student may petition the Departmental Advisory Committee to transfer from a M.Sc. to a Ph.D. program without first completing the requirements for the M.Sc. thesis.

The student must fulfill the following requirements in addition to those outlined by the CGPS:

- 1. Have both the supervisor(s)'s and M.Sc. Advisory Committee's approval to move to the Ph.D. Program,
- 2. Have the transfer take place either after completing his/her first year or no later than the end of the second year,
- 3. Have an academic record in the top decile (based on the last at least 9 cu's at the 800-level in last 2 years),
- 4. Demonstrate superior communication skills, both written and oral. Generally, this is shown by the authorship of a research manuscript that is publication-ready or submitted,
- 5. Demonstrate an ability to perform original research independent from the supervisor, preferably, with one accepted peer-reviewed publication,
- 6. Be already engaged on a research program that can readily meet the additional rigorous requirements of a Ph.D. (A revised proposal may be needed at the time of transfer),
- 7. Pass a qualifying exam (in lieu of the M.Sc. thesis defense). Also, a student, if initially accepted as a conditionally-qualified student, must pass the qualifying examination to be fully-qualified to the program.
- 8. Have completed/be enrolled in a minimum number of 9 credits at the M.Sc. level (800-level) and an additional 3 credits at the Ph.D. level.
- 9. Upon transfer, all requirements of the Ph.D. degree must be met, i.e., a student must pass the Ph.D. comprehensive examination to be a Ph.D. candidate in the program.

Voluntary Transfers

Transfers from one graduate degree program to another within the same department, or in another department, are permitted. Students may be required to have met certain criteria and/or meet other requirements once the transfer has occurred. Special fees may be assessed therefore it is advised that the student consult the current Graduate Studies Policy Manual at: <u>https://cgps.usask.ca/policy-and-procedure/index.php#ACADEMICS</u>.

Qualifying examinations

If a student has not been awarded a M.Sc. degree from the Department of Food and Bioproduct Sciences, University of Saskatchewan, a qualifying examination is required. A student failing the examination for the first time may take a second qualifying examination, but a second failure automatically disqualifies him/her from further work for the Ph.D. degree. (For details, consult Appendix A. Guidelines)



ROLES AND RESPONSIBILITIES OF THE RESEARCH SUPERVISOR AND ADVISORY COMMITTEE

Research Supervisor (Or Project Supervisor for M.Agr. students)

The research supervisor plays a key role in fostering your progress as a developing scientist; he/she is responsible for establishing your plan of study and course work, for proposing the membership of your advisory committee, for ensuring that you progress towards fulfilling degree requirements in a timely fashion, and, most importantly, for working closely with you in your graduate research. The bonds a student forms with the research supervisor are often long-lasting, and founded upon both a close professional working relationship and friendship.

The research supervisor of a graduate student in the Department of Food and Bioproduct Sciences is usually a university member of the departmental faculty. If the student's research is to be conducted in one of the government laboratories or other institutions associated with the university, a member of staff of the associated organization who holds an adjunct appointment in the department usually serves as supervisor or as joint supervisor in conjunction with a university member; this arrangement ensures that the administrative aspects of the student's program are appropriately dealt with.

Professors differ in their philosophies of graduate training; some spend considerable time with their students, closely directing their studies. Others allow their students to explore widely and view their supervisory role as a sounding board on which students may try out new research ideas. Most professors fall somewhere between these extremes. For open communication it is important that both parties understand their most comfortable style of learning and communication.

Occasionally, students find after beginning their work that their interests do not arouse the interest of the research supervisor, that the supervisor's program is not oriented in a direction the student wishes to pursue, or that they simply do not get along. If your current situation seems not to be working, you should first raise your concerns with your supervisor; a frank discussion will often lead to the resolution of problems, which benefits both supervisor and student, and to the resumption of productive work. If this approach does not resolve your concerns, you should consult the Graduate Chair of your advisory committee or the Head of the department and consider a change in supervisor or project.

It is appropriate that a student should have some expectations of the research supervisor. The student, however, should not overlook the fact that the supervisor will have significant expectations as well. The research programs of professors are supported almost exclusively by grants and contracts for which they compete on a national basis. A major factor determining the success or otherwise of applications made by your supervisor is their record of research productivity, both past and current. When you have been accepted as a member of a professor's research team, and he/she has committed time, space and funding to your program, you are enjoying benefits that have been provided through the efforts both of the professor and others who have contributed to the program. In order to maintain their research momentum, they will expect you to work conscientiously and productively too. Prompt publication of research results are often the means by which researchers and students attract funding and obtain employment. Publication quality is important to future opportunities as well. There are many venues for making a contribution that may be recognized including; publication of papers in peer reviewed journals, publication of abstracts in scientific meetings, publication of reviews, and patents to name a few.

Advisory Committee

The website of the College of Graduate and Postdoctoral Studies outlines the functions of the advisory committee for students in graduate degree programs.

The initial planning of a degree program is usually done by the student and the research supervisor. This involves selecting the courses that are to be recommended to the advisory committee (AC), determining the general area in which the thesis research will be done, provisioning the Graduate Chair with suggestions for membership of the advisory committee. The Graduate Chair is consulted at this stage because he/she is responsible for naming the members to the AC, inviting proposed members of the committee to serve and submitting the Program of Studies (POS). The Graduate Chair delegates the role of chairperson (AC Chair) for AC meetings and examinations to a faculty member. She/he will serve for the student's entire program. (For details, please refer Appendix A. Guidelines.)

Meetings

One of the functions of the advisory committee is to periodically review the progress made by the student. The committee must meet at least once a year (ideally every 8 months) for this purpose.

<u>Initial meeting:</u> M.Sc. and Ph.D.: An initial advisory committee meeting is generally held within **16** weeks of the student's arrival to look at the student's academic history and suggest appropriate coursework. If most courses have been chosen at this time, with the approval of the AC, a formal POS is developed. M.Agr.: An initial advisory committee meeting must be held within 2 weeks of the student's arrival. In this meeting, the initial POS for the students must be developed and approved.

<u>Proposal meeting</u>: M.Sc. and Ph.D.: A follow-up meeting is held after 6 – 8 months in the program to examine the student's research proposal and research activities. Each student registered in a research-based graduate degree program must prepare and submit a **formal research proposal** before, or soon after, thesis research is begun (check department template). This proposal should provide relevant literature background for the research you intend to pursue for your degree; it should include a full description of the objectives of the study, and the methods of data collection and analysis to be used, and should be organized in the form of the discrete experiments which are to be done. A milestone chart should be included to show the anticipated schedule for the research, and to provide a basis on which your subsequent progress can be judged. A more substantial proposal would be expected from a Ph.D. candidate than from a student in a M.Sc. program. The proposal should be discussed with your research supervisor, and copies prepared for presentation to your advisory committee. If the research proposal is presented to the committee beyond the 8 month mark in the program, the research proposal should also include a section on progress-to-date, including graphs, tables and interpretation of results.

M.Agr.: A meeting should be held in the January semester to discuss the research proposal of the student project. The student must submit the proposal two weeks prior to the meeting. The format and requirements of proposal adapt the same as M.Sc. and Ph.D. proposals.

<u>Progress meetings</u>: Prior to a scheduled meeting (meetings should be scheduled by your supervisor in consultation with the AC Chair) you should consult with your research supervisor about the preparation of a written research proposal or progress report, depending upon the stage of your research. Research reports will typically include a title page, table of contents, introduction, materials and methods, results and discussion, and references. In general, the report should follow the format of a typical research publication, or chapter in a thesis. A template that details the research progress report format and content is available. The importance of the progress report in your degree should not be underestimated; it documents your research progress and provides supportive evidence of the quality of your efforts. In cases where a student wishes to transfer from a M.Sc. to Ph.D. program, the quality of these reports can be helpful supporting documentation for example, in consideration of awarding scholarships.

You will be responsible for distributing copies of your proposal or progress reports to the members of your advisory committee at **least two weeks in advance of your scheduled meeting.** You will also want to prepare your presentation in advance and in consultation with your supervisor. At the meeting, the committee will review your progress in course work and may recommend changes or additions to your program. You will be asked to present your progress report or proposal (generally a 20-25 minute presentation) and the committee will discuss this with you. If necessary, the committee may recommend changes in your research project.

At the end of a scheduled meeting, the AC Chair will excuse the student for 5-10 minutes for an "in-camera" session with the AC to discuss his/her progress. At the end of the meeting, the chair will indicate any specific action to be taken by the student or AC and indicate a possible time for the next meeting. If, in the opinion of the advisory committee, progress has been unsatisfactory, the CGPS will be made aware of the situation. In cases where a pattern of unsatisfactory progress has been reported, students may be required to leave the program. The primary purpose of your advisory committee is to give you advice and constructive criticism to help you complete your program successfully. After most meetings, a formal Progress Report (PR) is submitted on PAWS. Students will be asked to sign a copy of the document, indicating that they are aware of its contents. Students can view their Progress Reports on PAWS.

Please note: Prior to each meeting with your committee, the Graduate Program Assistant will work <u>with</u> you to either prepare or update your "profile". This "profile" summarizes your academic background and the progress of your degree program, including courses taken, grades obtained, publications, presentations and scholarships received. **It is the accountability of the student that you contribute and verify the details in your "profile" <u>before</u> the meeting.**

WRITING A GRADUATE THESIS and PROJECT REPORT

When the time to start writing your thesis arrives, you should consult with the guide for preparation of thesis that has been prepared by the department and includes some information from the College of Graduate and Postdoctoral Studies. As of May 2009, only theses that follow these guidelines will be approved. M.Agr. project report should adapt the same format as the graduate theses.

The students should aware of the strict requirement of copyright permission to include the figures and tables from published articles. It is not allowed just to mention they are adapted from the source. You must write a request to the publishers and obtain permission. A statement that permission has been granted should be clearly indicated in the thesis.

All of the costs of producing a thesis or report, including typing, graphics, duplication and binding are normally the responsibility of the student. The department requires one bound copy of your thesis and project report; CGPS requires only the pdf version.

Binding of theses in Saskatoon is usually done by Universal Bindery Ltd. at 516A Duchess Street (652-8313). At least two weeks should be allowed for the binding to be done by this firm. Universal Bindery will not print the thesis so you will have to provide enough copies. For M.Agr. report, a simple binding method, such as spiral bind, is permitted.



PUBLICATIONS

The final step required to bring a piece of scientific research to completion is to publish the results in a refereed journal. Research makes no contribution to the advancement of knowledge unless findings are disseminated and made available to the scientific community at large. The submission of a manuscript for peer review involves submitting your experimental approach, findings, interpretations, and writing skills to a critical evaluation, the results of which should contribute to improving your future work. A consistent record of high quality publications will be a vital criterion in your professional career development and a major determining factor in your ability to secure research grants on a continuing basis.

You should discuss the expected schedule for publishing your own work with your research supervisor. In nearly all instances, it is desirable to take time periodically during your program to write up and submit publishable results. Successfully writing and publishing papers is an essential aspect of your graduate training, and if your work has been largely written up for publication before you write your thesis you will find thesis writing much easier. In other cases, it may be appropriate to write up your work at the end of your program, e.g., at the end of a M.Sc. program. **In all cases, however, you should establish a schedule which ensures that all your work is written up and submitted before you leave the department.**

Your research supervisor is in the best position to advise you on the mechanics of writing a manuscript for publication and to help you decide which journal to submit to. This decision is important because it affects; the format and presentation you will use. Consult the instructions to authors which the journal will either publish or provide on request, and carefully examine some of the papers which have been published in it. Copies of Robert Day's book, **How to Write and Publish a Scientific Paper**, are available in the Department and will provide some useful general guidance.

INTELLECTUAL PROPERTY POLICY

Intellectual property (IP) means the "tangible or communicable results of literary, artistic and scientific endeavour". For most students in the department, your research output may include IP that can be either protected under copyright, or in the case of inventions, through patents. Appendix C and Appendix D of the College of Graduate and Postdoctoral Studies Policy and Procedures Manual (on the CGPS website) outlines in great detail the intellectual property rights of graduate students as both creators and users of intellectual property.

Depending on the circumstances, the student may be the owner of the IP. More often, the IP is shared with collaborators, including the research supervisor, the financial sponsor(s) of the research programs and the University of Saskatchewan. In some circumstances, there may be restrictions on the IP generated (timing of release for example) due to contractual agreements. Students should talk with their supervisor about their work so that they may understand any IP implications. The University <u>Industry Liaison Office</u>-ILO is the unit with responsible for negotiating stand-alone IP agreements for the research and handling technology transfer activities.

(For more info: https://research.usask.ca/innovation-enterprise/technologies-and-ip/innovators-guide.php)

ACADEMIC INTEGRITY

The Department adheres to University policy in all matters involving academic integrity. As a Graduate student in this Department you are not only representing yourself, but also, the Department and the University. It is expected that you will perform all functions of your program (class participation, examinations, assignments or research) in a responsible, ethical and honest manner.

For more information, please see the University website at https://www.usask.ca/integrity/

COLLEGE OF GRADUATE AND POSTDOCTORAL STUDIES GRADUATING STUDENT CHECKLIST

Completion of the following checklist is required in order for you to graduate:

- ALL students: the online application to graduate will be found under the Academic profile channel in your PAWS account.
- All thesis and dissertation students: submit the final revised and approved version of the thesis or dissertation to the ETD Site <u>http://etd.usask.ca/</u>
- all students who plan to attend the Convocation Ceremony: order ceremony tickets and a graduation gown (once email from the Convocation office comes through your PAWS email account telling you that the window is open for ordering)

Information regarding the ETD formatting and style may be found here: <u>https://students.usask.ca/graduate/thesis-preparation.php</u>

Important Information for Graduating Students

1. Complete the Online Application to Graduate:

Deadlines: **March 31** for Spring Convocation / **August 31** for Fall Convocation Thesis and Dissertation titles can also be entered on this application. A Graduate Programs Advisor will send a list of titles to the appropriate unit to check for accuracy. Please note: an application to graduate is necessary to receive a degree parchment.

2. Submit all required documentation indicating program completion to CGPS

Deadlines to meet eligibility for Fall and Spring Convocation may be referenced on the Academic Calendar: <u>https://students.usask.ca/academic-calendar/</u>

Thesis/Dissertation Students: Once you have successfully defended your thesis or dissertation, there are several forms that your supervisor, committee members, and graduate chair must complete and sign and submit to the graduate programs advisor in CGPS, 116 Thorvaldson Building.

**Course-based and Project students:* Check with your department to ensure that you have completed all requirements.

Some general notes:

- <u>Course registration must be maintained until all requirements for graduation are complete</u>. <u>You must be registered in the term in which you defend and until all requirements have been met, including all required documents</u>.
- Ensure that you are within the allowed timeline for completion of your degree. This timeline begins with the first class credited towards the degree. Extensions to complete requirements may be granted; contact your academic unit to apply for an extension or to inquire about your time in program status. If you are on extension at the time of your defence, CGPS will register you in the thesis course for the following term until you have finished all requirements. You will be responsible for tuition and student fees.
- If you are a current recipient of a graduate scholarship from CGPS, you must notify the Director of Awards when you will complete your degree. **Students are financially responsible for reimbursing the University for any payment(s) given in error.**
- Information about the graduation list will be available approximately three to four weeks before the ceremony once CGPS has the chance to enter all information and complete the checks for all graduate students.
- If you defend in Term 1 and complete **all degree requirements** and all forms are submitted before the Term 2 registration deadline, you will not need to register in Term 2. If you have any outstanding requirements, you will need to register in Term 2.
- You can check if your documents are complete for graduation with your graduate secretary/administrative assistant located in your academic unit.
- If you are eligible to receive pro-rated tuition refund, a graduate programs advisor will initiate this process on your behalf. Refunds will be credited to the student account. In order to receive all money refunded, please

fill out the refund request form: <u>https://students.usask.ca/money/tuition-fees/refunds.php</u> and provide this to Student Accounts in room E40 of the Administration Building.

• If you require written confirmation that you have completed your degree requirements prior to receiving your degree parchment, send an email to <u>alison.kraft@usask.ca</u> with the request, including the type of letter needed and a mailing address. Please note, this cannot be issued if holds for outstanding tuition are present. **Please allow ample time for processing of your request.**

3. Submit the final approved version of your Thesis/Dissertation/Project* to the ETD Site:

<u>All Master's thesis and Ph.D. students are required to submit their theses and dissertations to the Electronic</u> <u>Thesis and Dissertation Site</u>. Project students may submit their projects to the ETD site, as well, but not required to do so for completion of degree requirements. Please see the site at <u>http://etd.usask.ca/</u> for detailed information about this process.

Notes about the ETD:

- Supervisors and academic units may still require bound copies please check with your home department. CGPS does not require bound copies.
- Supervisors and academic units have the option to delay publication of a thesis/dissertation for copyright or other reasons. Students will have options to limit access to their ETD. Such requests are valid for one year. Any request to modify these restrictions **must** be submitted before the allowed access time has expired. Please email <u>alison.kraft@usask.ca</u> if further explanation is required.

Notes on Thesis Formatting

- A CONVOCATION DATE IS NOT TO BE INCLUDED ON THE TITLE PAGE. The only date will be in your copyright line. For example: "Copyright John Smith, December, 2007 All Rights Reserved" where the month and year indicated are the month and year of defence.
- Use lower case Roman numerals for the preface pages of your thesis. Roman numeral "i" is to be placed on the Permission to Use page and continues through to the end of the prefatory contents. Arabic numerals will begin on the first page of Chapter 1 and continue consecutively throughout the rest of your thesis, including the appendices. **Do not include the title page in the numbering.**
- The 'landscape' style page(s) need to have their page numbers in the same place as on the regular 'portrait' style pages, so that the numbers would all line up were the pages bound in a book. Instructions on how to number landscape pages can be found by searching the web for the keywords 'moving landscape page numbers'. Word processing programs differ but one site to try is http://word.mvps.org/fags/formatting/landscapesection.htm (or suppress the page number for that page;

insert a text box with no borders in the position (middle bottom). Then insert the page in this box and change the text direction).

- The CGPS Electronic Thesis site (<u>https://students.usask.ca/graduate/thesis-preparation.php</u>) has information on thesis formatting. Check with your academic unit as well, as they may have specific guidelines or styles.
- The Learning Commons in the Main Library has computers with Adobe and other programs and are able to assist you in converting to Adobe PDF.
- Submit your ETD directly to the ETD site where the graduate programs advisor will check the formatting of your thesis. The advisor can then advise you about any required changes. This site can be accessed from anywhere in the world and will accept just about any size file that may be attached.

4. About the Convocation Ceremony

- Information about the ceremony is available at https://students.usask.ca/academics/graduation.php
- This site will have information about tickets, ceremonies, where to meet, photos, etc. It is adjusted for the next ceremony approximately a month after current ceremonies.
- Announcements will also come through your PAWS email account regarding graduation.
- In order to order tickets online for the ceremony you **must** have a current address on your PAWS account. Go to paws.usask.ca, click on address, click on "My Mailing Address", and ensure that the most current address is listed and topmost. The address at the top is where your degree parchment will be mailed if you do not attend the graduation ceremony. It is the student's responsibility to ensure this information is

accurate and complete. This address change should be done at the time of submitting your application to graduate online.

- The University of Saskatchewan Ph.D. gown is black with green lining and gold trim. Please keep this in mind when choosing your attire for the ceremony.
- All other degrees have black robes with hoods of different colours which represent the graduate's discipline. Appropriate dress wear should be worn as well, as the black robes have no sleeves.
- **Purses, handbags, etc.** <u>SHOULD NOT</u> be brought into the backstage area. There are NO facilities available to store valuable articles so please leave any items with a family member or in your vehicle.
- Information about the ceremony itself will be supplied by the Convocation unit of Student Enrollment Services Division. This notice about the ceremony comes about 2 weeks after the deadline to apply to graduate. This information will list how to order tickets, information about how to order your gown for the ceremony, and basically anything to do with the ceremony.

Contact Information: <u>alison.kraft@usask.ca</u> Graduate Programs Advisor @ 966-1987, 116 Thorvaldson Building ~~

Information about a student cannot be released to a third party without the student's authorization.

-32-

SEMINARS

All graduate students must register each year in the seminar course (numbered 990) associated with their program, and they <u>must attend and participate</u> in the course regularly. Specific requirements for APMC or FDSC 990 will be communicated to students by the course coordinator. As of 2009, two seminars (one 20 minute, one 40 minute) are required for M.Sc. students in addition to an exit seminar. For Ph.D. students, two seminars (each 40 minutes in length) are required in addition to an exit seminar. For an M.Agr student, a 20-min FDSC/APMC990 is mandatory.

The preparation and presentation of a seminar should be taken very seriously, since it provides the kind of experience which is invaluable for later presentation of papers at scientific meetings, and for possible teaching assignments. Performance in seminars is frequently referred to in letters of reference as an indication of potential teaching ability.

In the absence of other instructions, the seminar should be timed to last 20 minutes (for short seminars) or 40 to 45 minutes. There should be a recognizable introduction and conclusion and a summary. A summary handout/abstract (maximum 250 words) with key references should be prepared and submitted in soft copy to the Graduate Program Assistant <u>two weeks before</u> the seminar date for distribution. Careful preparation of visual material is absolutely vital; text must be clearly legible to the audience and this implies an adequate size and neatness. Students should discuss and obtain approval for all aspects of seminar preparation from their research supervisor or from the seminar co-ordinator.

It is always a good idea to have a dry run of one's seminar, complete with the visual aids; this helps in timing and in learning to speak to Powerpoint slides. A laptop computer, an LCD projector, and a laser pointer are available in the General Office but must be booked. It is also a good idea to have a practice run-through of a paper to be presented at a meeting, and research supervisors usually gather a group together to hear and critique the papers of their students.

An evaluation sheet is distributed at each graduate seminar presentation and when completed the copies are collected by the seminar co-ordinator. They are then given to the student's research supervisor for discussion with the student. They usually provide very useful feedback and also provide a means for members of the audience to learn to criticize presentations constructively. Regular participation in a 990 course and presentation of the required seminars each term will earn a grade of "CR" (completed requirements) upon completion of the degree.

In addition to the seminar courses organized for each graduate program, there are many other seminars given on campus throughout the year. Attendance at these is strongly encouraged when the topic is relevant. Notices of seminars are always posted on the bulletin board near the General Office and the bi-weekly publication **On Campus News** lists many upcoming seminars and lectures.

STUDENT GRIEVANCES, APPEALS AND DISCIPLINE

The University Council and college regulations on examinations and student grievances, appeals, and discipline regulations are available on the University of Saskatchewan websites. <u>https://students.usask.ca/graduate/appeals-leaves-extensions.php</u>

It is recognized that students have a right to fair and equitable procedures for the lodging and hearing of complaints arising out of university regulations, policies and actions that might affect them directly. Such procedures are described in the regulations: <u>http://policies.usask.ca/policies/student-affairs-and-activities/student-appeals.php</u>.

The regulations applying to graduate student appeals with respect to academic standing or status are found in the link: http://policies.usask.ca/policies/student-affairs-and-activities/student-appeals.php

There are three types of student matters that are facilitated by the Office of the University Secretary: appeals in academic matters, academic misconduct, and non-academic misconduct. http://www.usask.ca/secretariat/student-conduct-appeals/index.php

Students with concerns of any kind are strongly advised to discuss them in the first instance with their research supervisor and the Department Head.



FINANCIAL ASSISTANCE

Choosing to pursue graduate studies is a commitment in study, time and finance. We realize that many of our applicants will require assistance from one or more sources. There are fortunately several options available; you will find them with brief descriptions and their deadlines below. (Note: M.Agr. students are not eligible to the financial supports discussed in this section.)

External financing:

NSERC Postgraduate Scholarships

These prestigious scholarships are awarded in an annual national competition hosted by the Natural Sciences and Engineering Research Council of Canada (NSERC) and are primarily awarded for academic excellence. Complete details on how to apply and the required criteria are in the annual NSERC Scholarships and Fellowships Guide which you can find at the link below: http://www.nserc-crsng.gc.ca/Students-Etudiants/index_eng.asp The detailed application form may require some time to complete so please plan ahead.

If you chose to apply, applications are submitted online which once completed, is to be brought to the Department office by the deadline date. Once the application has been submitted, a university committee reviews all applications and then forwards them to NSERC for consideration.

Awards are announced at the end of March and are at a maximum duration of two years.

Scholarship payments will be made in installments. Recipients may demonstrate, instruct, etc., up to 300 hours per year and may accept other scholarships from non-federal sources.

OTHER:

Occasionally the department accepts a degree student who offers to provide his/her own funding. This is frequently in the form of a fellowship or scholarship awarded and administered by an overseas government and in such cases, the student is only accepted if the College of Graduate and Postdoctoral Studies can obtain a firm undertaking from the sponsor to continue support for the duration of the student's degree program. In these circumstances, the department accepts no responsibility for providing funds to the student or any attempt to obtain funds should the scholarship be terminated.

Internal financing:

Dean's Scholarships

The intent of Dean's Scholarships is to attract high caliber students to the University of Saskatchewan. These awards will be offered to students who have outstanding academic records, show research promise and are registering for the first time in a thesis or dissertation-based graduate program in May or September at the University of Saskatchewan.

A Dean's Ph.D. Scholar will receive \$22,000 for a one-year term, with a possible 12-month renewal pending satisfactory progress toward completion of the degree. In the context of this award, satisfactory progress includes: maintaining an 85% GPA on at least 6 credit units of courses completed after registration at the U of S, endorsement of the student's research proposal by the graduate advisory committee and successful completion of the qualifying exam. The academic unit or supervisor must guarantee an additional (3rd) year of funding at the same level as above, which may require some service depending upon the source of funding.

A Dean's Master's Scholar will receive \$18,000 in the first year of his/her program and the department or supervisor will guarantee an additional year at the same level of support, pending satisfactory progress toward completion of the degree. This matching support may require some service depending upon the source of funding. While receiving support from the Dean's Scholarship fund, students may be expected to provide a maximum of 4 hours per week for 2 terms during a 12-month period.

For complete application criteria and process details, please refer to the following links:

http://grad.usask.ca/funding/scholarships.php http://grad.usask.ca/funding/international-scholarships.php

Department Devolved Graduate Scholarships (DS)

The Devolved Scholarship funding is administered by the Department for all eligible, active graduate students.

In order to be eligible, the student must:

- 1. be registered as a full-time student and meet all requirements for such status,
- 2. have a minimum overall average of 80% on all courses taken during the last two years of academic work,
- 3. be in good standing with respect to admission, registration, tuition, and fees at the University of Saskatchewan,
- 4. be able to show significant progress on his/her graduate education and training,
- 5. show strong leadership skills within the Department and
- 6. have completed time in the program within the expected program completion period.

Students may only receive a maximum of \$18,500 (M.Sc.), 22,000 (Ph.D.) or \$37,950 (Ph.D. transfer) from Devolved Scholarship (DS) funds over the duration of their graduate program.

To apply, the student is expected to prepare a case file outlining accomplishments. This would include a cover letter, a one-page statement of research plan, any abstracts from previous graduate degrees, if available, and a CV indicating any previous scholarships, research experience, and leadership roles.

Third year Ph.D. candidates (or fourth year Ph.D. transfer students) must provide evidence of scholarly work leading to the submission of a peer-evaluated journal publication and/or professional presentation or contributions to intellectual property, such as work towards a patent application and invention disclosure.

It is recommended that students consult with their supervisors in preparing their case file.

Once all applications are received (deadline is typically communicated in March each year), the Committee will forward recommendations for Department Devolved Scholarships to the Department Head on behalf of the students. Funds are then awarded for up to one year and are made in equal monthly installments in order to support as many qualified students as possible. Most awards will be for partial support.

College of Agriculture and Bioresources Postgraduate Scholarships

A limited number of scholarships awarded for superior performance are allocated annually by the College of Agriculture and Bioresources. These do not have a departmental service requirement.

The types of award include "major recognition awards", which require a minimum overall average of 80% on all courses taken during the last two years of academic work, and "scholarship awards", which require high academic standing. Research aptitude, achievements, financial

need and time in program are also taken into account. The value of these awards is variable.

To apply, the student must:

Complete an online application: <u>https://agbio.usask.ca/students/graduate/graduate-scholarships.php</u>

Completed applications are to be submitted on-line (as instructed in the above link) by the deadline date (usually by the end of May). Recommendations for College awards will be forwarded to the Dean or designate on behalf of the students.



Large College awards are disbursed in monthly installments. Smaller awards (under \$5000) may be issued in a lump sum.

Normally, these scholarships are not renewable and a student may hold only one "major recognition award" during the postgraduate program. If a recipient holds another award, the College of Agriculture and Bioresources scholarship is adjusted in value so that the total award income does not exceed the University Graduate Scholarship level in the case of "scholarship awards" and the NSERC assistantship level in the case of "major recognition awards". Recipients may provide services to the department for which additional payment may be made.

Graduate Teaching Fellowships (GTF)

These fellowships, awarded by the College of Graduate and Postdoctoral Studies, are available to fully-qualified, fulltime students who meet the academic requirements of the award. These awards can be made as full or half GTFs.

The eligibility requirements are:

- 1. a grade point average of at least 80%,
- 2. required background,
- 3. knowledge and training in the field in which service is required.

New and continuing students should inform the Graduate Chair, in writing, as early as possible of their interest in being considered for a GTF, providing full information and documentation on their ability to carry out the required service. Students should refer to the following link <u>https://grad.usask.ca/funding/scholarships.php#University</u> for further information regarding GTF's.

Academic units make recommendations for appointment of eligible and suitable qualified students to the dean of the College of Agriculture and Bioresources who allocates the fellowships.

GTF payments will be made in equal monthly installments. Full GTF holders provide service in the form of demonstrating, leading tutorials, teaching, marking, etc. up to 12 hours per week for the September-April period. Duties remain the same for those students holding half GFTs however, hours or months of service are reduced by half.

Other Awards

CGPS provides an online database about the awards available through them: <u>http://grad.usask.ca/funding/award-search.php</u>

Any other award information received by the department is either posted or circulated.

Demonstrating, Marking, Laboratory exercise preparation etc.

There are usually a limited number of opportunities each year for graduate students to undertake paid instructionrelated and laboratory support assignments (TA) such as laboratory demonstrating, marking and laboratory clean-up. Such service is regarded as providing useful experience for the students concerned, in addition to supplementing income. Applications are to be submitted in response to specific postings and completed on a prescribed form to FABS Office during August and December of each year. Appointments are made at the discretion of the instructors requiring assistance, who take into account such factors as background, potential or demonstrated teaching ability, prior service and financial need.

These positions are paid according to the recommended hourly rates posted by the University at: <u>https://working.usask.ca/agreements/compensation/salary-ranges.php#PSACGraduateStudents</u> and all earnings are subject to Employment Insurance (EI) and Canadian Pension Plan (CPP) deductions.



VACATIONS AND LEAVE OF ABSENCE

Students are entitled to a maximum two weeks (i.e., 10 working days) of paid vacation each calendar year in addition to weekends, statutory holidays and regularly-scheduled university breaks (i.e., when the University is officially closed). It is the student's responsibility to obtain approval from his/her supervisor(s) BEFORE planning and taking vacation.

Students may be granted a leave of absence from their study for the following reasons: compassionate, medical, parenting, adopting, educational, and involvement in 'Co-op Program'/Industry opportunities. Other circumstances will not be considered, and the student may need to withdraw from the program if they will be absent for an extended time period. If the student intends to be absent, the leave must be granted by the Department and/or the CGPS. Otherwise, he/she will be assessed tuition and the absence will count towards their time in program.

Please see Appendix A. Guidelines for details.

GRADUATE STUDENTS' ASSOCIATION

All registered graduate students are members of the Graduate Students' Association (GSA) which represents their interests within the university, as well as provincially and nationally. The Association is governed by a General Council consisting of an elected Executive and student representatives from departments. General meetings, which all graduate students may attend, are held twice a year. Students in a number of departments, including the Department of Food and Bioproduct Sciences, have been organized into a system of course councils which act as mini-associations within the GSA. As well as sending representatives to the General Council, course councils provide a basis for academic and social interaction. In recent years, graduate students in the department have played an active role in the GSA at the Executive and General Council levels. The GSA's office is located at Emmanuel & St. Chad, 1337 College Drive (8471, fax 8598, email; gsa.commons@usask.ca).

The GSA focuses on matters that directly affect graduate student education, such as academic affairs and funding, and the promotion of social and academic interests among graduate students. In addition, the GSA offers support and advice to graduate students who have questions/concerns about their rights and responsibilities and those of their professors, supervisors, the academic unit and the CGPS. Students should not hesitate to contact their course council representative or a member of the GSA executive with questions and suggestions, or regarding difficulties, hearings and appeals. If they wish, they may take along a colleague of their choice to meetings and hearings.

Also, the GSA administers health and dental insurance programs for all full-time students. If a student is already receiving extended health and/or dental benefits, she/he is able to opt out of these plans, and will be reimbursed. Opting out can be done either online or by visiting the health and dental plan office within the first two weeks of September.

For more information about the GSA and the services and benefits they provide, visit the GSA website at <u>http://www.gsa.usask.ca/</u>.

FABS SOCIAL CALENDAR

Each year we have three standing events: the Academic year kick-off in September for both undergraduate and graduate students, the FABS-ulous Pumpkin carving contest in October and the International Potluck in December. These are always well attended and a lot of fun (not to mention well catered!). We strongly encourage you to participate and attend these events to experience the reputed enjoyment.



Enjoying the International Potluck



Some graduate students enjoying the Annual FABS-ulous Pumpkin Carving Contest



Public exhibition at Agriculture in City



Department Research Day



Some students at the Academic Kick-off



Convocation

SCIENTIFIC SOCIETIES

Graduate students are encouraged to join a scientific society as student members during their training in order to develop professional associations in their respective disciplines, and to establish contact with prospective employers or researchers with similar interests. Many graduate students in the department join either the Canadian Society of Microbiologists, the American Society for Microbiology, the American Oil Chemists Society (Canadian Section) or the Canadian Institute of Food Science and Technology. Other societies may be more appropriate for particular students. Your supervisor will be the best guide for such memberships.

Canadian Society of Microbiologists

Incorporated in 1958, the Society has about 500 members who share a common interest in microbiology. The CSM is divided into 3 sections: Applied and Environmental Microbiology, Infection and Immunity and Molecular Genetics and Cellular Microbiology. It sponsors an annual meeting held on a Canadian university campus, usually in June, a travelling lectureship in microbiology, an award for the Canadian graduate student of the year, as well as other support and awards to enhance the graduate student experience.

The Society maintains close contact with the Canadian College of Microbiologists (the professional licensing body), the American Society for Microbiology and the International Union of Microbiological Societies.

Members receive three issues of the CSM Newsletter which contains information on Society meetings and business, government policies, employment opportunities, and graduate training programs. Members receive the popular graduate Studies and Membership Directory, a full 130 page publication. They have the opportunity to post jobs and read ads on the website, and receive representation in science policy at the national level. Student membership provides, in addition, special rates for registration at the annual meeting and for subscriptions to the <u>Canadian Journal of Microbiology</u>.

The fee for student and postdoctoral memberships in 2008 was \$30.00. Application forms are available from faculty members, any of whom will be pleased to sponsor a student applicant and to certify student status. All application information, as well as information about the society and its activities, are available at the CSM website (http://www.csm-scm.org/).

American Society for Microbiology (ASM)

The American Society for Microbiology (ASM) is the oldest (est. 1899) and largest single life science membership organization in the world, with more than 43,000 members. Membership is divided into 26 disciplines of microbiological specialization, including a division for microbiology educators. ASM's mission is to advance microbiological sciences through the pursuit of scientific knowledge and dissemination of the results of fundamental and applied research.

The Society hosts three annual meetings. At the General Meeting, held each May, microbiologists exchange information and gain insight across a variety of scientific disciplines. Additionally, the Interscience Conference on Antimicrobial Agents and Chemotherapy (ICAAC), the premier meeting on infectious diseases, and the Biodefense Research Conference, are held each year. Other scientific opportunities include numerous topical conferences held globally, live teleconferences, and webinars.

ASM has its own publishing division, ASM Press, which publishes 11 professional journals: Eukaryotic Cell; Clinical Microbiology Reviews; Journal of Virology; Journal of Bacteriology; Molecular and Cellular Biology; Antimicrobial Agents and Chemotherapy; Applied and Environmental Microbiology; Clinical and Vaccine Immunology; Journal of Clinical Microbiology; Microbiology and Molecular Biology Reviews; and Infection and Immunity. These journals are widely regarded as having high impact factor publications.

A regularly matriculated student of microbiology or a related field is eligible to become a student member. There are also separate membership categories for postdoctoral fellows and for transitional scientists in the early years of a career. As of 2008, a student membership was available for \$17 USF per year; student members must provide Department Chairperson information to join or renew. Membership for postdoctoral fellows was \$39 USF. All application information, as well as information about the society and its numerous publications, are available at the ASM website (www.asm.org).

Canadian Institute of Food Science and Technology (CIFST)

The CIFST (founded in 1951) is an organization of about 1200 professional and technical people engaged in the application of science and engineering to every aspect of production, processing, packaging, distribution, preparation, evaluation and utilization of food. Members are drawn from industry, universities, technical colleges and government organizations. It is a national organization with its head office in Toronto and with active local sections throughout Canada. In 2016, CIFST formed a new regional section in Saskatchewan in order to enhance the presence of food science in this province.

Membership provides a complimentary subscription to Food in Canada, which includes material on Institute affairs and the Canadian food industry; a subscription of one's choice to one of the following three journals: Food Research International, Trends in Food Science and Technology, and Trends in Biotechnology (others may also be possible); an opportunity to attend the annual national conference; the chance to participate in a very active program of monthly meetings and activities at the local level; and the same kind of representation in science policy as the C.S.M. provides for microbiologists.

Application forms are available from faculty members and may be forwarded to the membership chairperson of the Saskatchewan CIFST Section or to the national office. The fee for student membership in 2019 is \$43.00 for a basic membership and \$16 for an additional regional section registration (<u>https://www.cifst.ca/</u>).

Canadian Section of American Oil Chemists' Society (CAOCS)

The Canadian Section of the American Oil Chemists' Society (CAOCS) is a regional subsidiary of the AOCS. The AOCS mission is to provide a global forum to promote the exchange of ideas, information, and experience, to enhance personal excellence, and to provide high standards of quality among those with a professional interest in the science and technology of fats, oils, surfactants, and related materials. They also have a strong section on proteins and other co-products.

AOCS and CAOCS members have ready access to a network of individuals with experience related to their technical area. Students can gain access to dedicated professionals, current technical information, important meetings, and much more. AOCS members span the globe and use AOCS as a forum to exchange information while supporting the fats and oils field.

The AOCS and CAOCS provide a forum for students with interest in fats, oils, surfactants, detergents, and related materials. AOCS provides products, services, and awards of interest to students. Students may post their resume or search for jobs and internships, learn about university programs in the field, and participate in live bulletin board discussions.

Student membership to the AOCS is **free**. Student members now receive online *inform* for free and have access to the Student Common Interest Group Newsletter online.

CONTACT INFORMATION:

Please read the above carefully. For additional information not covered in the above, please contact:

| Department Graduate Programs | Ann Harley | ann.harley@usask.ca |
|------------------------------|-------------------|-------------------------------|
| Assistant | | fabs.gradstudies@usask.ca |
| Graduate Chair | Dr. Takuji Tanaka | <u>takuji.tanaka@usask.ca</u> |

Q&A:

I don't have health coverage in this province...what do I do?

You will need to complete an application form which you can find at the following link: <u>https://www.ehealthsask.ca/residents/health-cards</u>. We encourage you to send this off as soon as possible as delivery of your health card number could take up to 4 weeks. Additionally, you can contact your Graduate Students Association and find out about purchasing additional health/dental coverage.

How do I get a student card?

You can get a student card any time within operating hours at the main bookstore in Marquis Hall. The cards are free and you will need to provide some id when you go there (either a passport or permit will suffice). You also have to be registered to get a student card.

For more information you can go to the website: <u>https://students.usask.ca/essentials/student-id-cards.php</u>

What if my personal information (address, surname, etc.) changes in the time of my program?

Changes can be made on PAWS. As soon as some information changes you should make the changes to avoid missing payments or important mailings.

How do I get a Social Insurance Number?

You will need to bring your study permit and your letter of offer with you. Service Canada is now located in Market Mall (2325 Preston Avenue). To get here from the Agriculture building, you can take a city bus if you do not have a vehicle. City routes and schedules can be found at: https://transit.saskatoon.ca/

You will need to obtain a Social Insurance number (SIN) as soon as possible.

There is no cost for the SIN but please allow for some time to receive services as it is a queue system. You will need to have your valid study permit and visa with you for authentication.

I am not able to register for courses on-line, what could be the problem?

You can come to the Graduate Programs office and one of the Graduate Program Assistants can look at your student status and see if there are any applicable holds or restrictions. Any waiver or further information required can usually be settled at that time and typically, you are able to register shortly after.

Where can I pay my tuition?

This can be done either on-line through PAWS using Interac banking or your Mastercard (VISA is not accepted) or in person at the Admin Building at Student Finance & Awards (<u>https://students.usask.ca/money/tuition-fees/pay.php</u>).

APPENDIX A. GUIDELINES

Guideline for Vacation of Graduate Students in Department of Food and Bioproduct Sciences

Students are entitled to a maximum two weeks (i.e., 10 working days) of paid vacation each calendar year in addition to weekends, statutory holidays and regularly-scheduled university breaks (i.e., when the University is officially closed). It is the student's responsibility to obtain approval from his/her supervisor(s) BEFORE planning and taking vacation.

- 1. The student must consult with and receive written (e.g. email) approval from his/her supervisor(s) before taking vacation. The student must plan their vacation so that it does not conflict with research, course work, and other degree requirements.
- 2. After the vacation time has been approved by his/her supervisor(s), the student must submit the start date and duration of the vacation to the Graduate Programs Assistant.
- 3. Unexpected absences, such as family issues and other emergencies, may be considered as a leave of absence. The student must consult with his/her supervisor(s) in these situations.

Guidelines for leave of absence application and processing for graduate students in Department of Food and Bioproduct Sciences

As stated in CGSR policy, students may be granted a leave of absence from their study for the following reasons: compassionate, medical, parenting, adopting, educational, and involvement in 'Co-op Program'/Industry opportunities. Other circumstances will not be considered, and the student may need to withdraw from the program if they will be absent for an extended time period. If the student intends to be absent, the leave must be granted by the Department and/or the CGSR. The leave period is not included in the time period for completion of the degree, and tuition is not assessed during the leave. Nominal student fees are assessed during the leave period. Otherwise, he/she will be assessed tuition and the absence will count towards their time in program.

Student actions

- 1. The student must discuss with his/her supervisor(s) the reasons for the requested leave of absence.
- 2. The student must make a written request for the leave of absence indicating the type of leave being requested, explaining the circumstances necessitating the leave and, if it is a medical leave, provide a medical note or other medical documentation. The request should be submitted to his/her supervisor and the department Graduate Chair.
- 3. At the end of a medical leave, the student must submit a medical note stating that the condition necessitating the leave no longer affects the student's ability to continue in his/her program.

Supervisor(s) actions

- 1. Supervisor(s) discusses the student's request with the student. Prior to his/her decision, the supervisor may choose to consult with the advisory committee to discuss the appropriateness of the leave, such as the case for an extended leave and a second leave application.
- 2. Supervisor advises the student whether or not he/she agrees with the leave request.
- 3. Supervisor(s) provides appropriate information to the department Graduate Chair about their discussion, indicating whether or not he/she agrees to the leave.

Graduate Chair actions

- 1. Graduate Chair reviews the request from the student and supervisor(s), and confirms the reasons for the leave are in accordance with CGSR Policy.
- 2. Graduate Chair discusses the necessity of the leave with the student, if required.
- 3. If it is the first request for a leave of absence AND the leave of absence is less than four months, the Graduate Chair can approve it.
- 4. If the intended leave is shorter than one month and the conditions are appropriate, Graduate Chair can approve the leave.
- 5. If there has been more than one request, or the requested leave is for more than four months, the CGSR must approve the request.
- 6. The Graduate Chair forwards the written request for all leaves to the CGSR for processing and/or approval. (note: requests can be sent via email)

If the request is denied by the department, the students can register an appeal of the decision with the Dean of the CGSR.

The duration and maximum length of leave of absence

Leaves of absence for compassionate, medical, educational, or 'Co-op Program'/Industry reasons are accommodated with a reasonable manner.

If the student needs a longer leave of absence, he/she must ask for an extension before the approved leave period is expired. The student must supply information to supporting the extension, and the extension must be approved by the CGSR

Medical and/or compassionate leaves shall not exceed 12 months consecutively, or 24 months collectively. Students can take leave multiple times during their program; however, the absence should not exceed 24 months in total. When it exceeds 24 months, they need to withdraw from the program and re-enter after their intended leave is over.

A graduate student who is bearing a child, and/or who has primary responsibility for the care of a child immediately following a birth or an adoption is eligible for parental leave. A parental leave may be granted for up to 16 months and a maternity leave may be granted for up to 4 months. Maternity leave and parental leave can be taken consecutively when applicable.

A four-month leave for a co-op program in industrial settings will be granted to spend a period of time in industry or the public sector pursuing research-related activities which are closely linked to their Master's or Ph.D. Program of Studies. Such a leave may be repeated once at a later time in the program, i.e., total up to 8 months are allowed.

The leave for the reasons not specified in the CGSR policy

If the leave of absence is for reasons not specified in the CGSR policy, the leave will not be granted. In this case, the student should consult with the supervisor(s) and Graduate Chair. The student has the option of withdrawing from the program instead of taking a leave, and may be re-admitted. Course work, research, and other required elements that the student completed before the withdrawal may be counted towards degree requirements after re-admission.

Created on June 28, 2016 Revised on August 9, 2019

Guidelines for the Administration of the Ph.D. Qualifying Examination

The qualifying examination is a requirement of the College of Graduate and Postdoctoral Studies (CGPS) for graduate students who are transferring from an M.Sc. program without thesis defence, who directly enter into the Ph.D. program from a B.Sc. program, or whose acceptance specifies the examination as a requirement for full admission into the Ph.D. program. The objective of the qualifying examination is to evaluate the depth and breadth of knowledge of the student in areas that pertain to their discipline (i.e., Food Science or Applied Microbiology). Fundamentally, **the exam's purpose is to determine whether the student has sufficient basic knowledge in a chosen scientific discipline to enter into a Ph.D.-level program.** Thus, the examination must be at least as rigorous as the defence for a Master's thesis. While primarily an assessment tool, the qualifying exam also provides an educational opportunity to improve their knowledge of their discipline as well as to give them experience in an oral examination which would benefit future performances such as defence.

The examination shall be conducted by the student's (potential) advisory committee for her/his Ph.D. program (minimum five examiners: supervisor, two regular members, one cognate member, and advisory committee chair). The content of the examination shall fairly and reasonably reflect materials which the student would be expected to know and understand in view of the prevalent and current norms of the discipline and the student's chosen area of research. (For direct entry Ph.D. students: The examination may limit the areas to their research fields of past and planned. Since the students are admitted based on their 'exceptional' potentials judged from their records, the examiner should consult with their record of administration and choose the topics and questions to test their background preparation is up to the level of an M.Sc. holder.)

For transferring students: This examination for the purposes of transfer can only be taken once.

For probational and direct entry Ph.D. students: A student failing the first Qualifying Examination is permitted a <u>second</u>, written examination with permission of the Dean of the CGPS A second failure would automatically disqualify the student from further work for that particular Ph.D. degree. This failure may be appealed to the Ph.D. Committee on substantive or procedural grounds. Students are also given an opportunity to revert to the Master's degree program in their field.

1. Administration of the Ph.D. Oral Qualifying Examination

Time Limit: 2 hours

Examination Questions:

Each member of the examining committee, which may include the Graduate Chair, will have two rounds of questions. Should the Graduate Chair choose to participate as a member of the examining committee, this should be communicated to the student in advance. In the first round, each examiner will have 10-15 minutes for questioning. The scope of questions asked will depend on the examiner's designated area and relevance of the student research.

In advance of the examination, each examiner should prepare a list of questions for their own use at the exam. Each examiner's scope of questioning may be shared in advance with the student, but not the specific questions. The questions raised by the examiner should address the root disciplinary base(s) pertinent to the student's degree program (theories, historic developments, current issues, concepts, methodology, tools, etc.) or directly relate to aspects of the area and discipline(s) of his/her research. The candidate, by correctly answering the question, will have to demonstrate his/her good knowledge with respect to the subject area. A certain amount of in-depth probing may be appropriate. Such probing may be continued during the second round of questions.

Questioning in the second round will generally be shorter than the first round. The questions may be related to those already raised, but a greater depth of understanding is required. Alternatively, new questions from the examiner's list may be asked. The intent is to ensure that the questions enable the examiner to accurately assess the student's comprehension and understanding of the subject matter, his/her ability to synthesize information and his/her convergent thinking and problem-solving skills. Therefore, the committee members should be thoughtful in the design of their questions. The tendency to raise questions in an *ad hoc* manner is discouraged.

Process:

Once a question has been asked, the student must be given time to gather his/her thoughts and to answer the question. Redirecting or rephrasing the question is encouraged and the Chair may clarify the question if necessary.

The student is encouraged to utilize the white/chalk board or a piece of paper to organize his/her thoughts, or to help explain a concept or theory. If the student is successful in handling a few questions in the first round, the examiner may stop and wait for the second round. Using up the allotted time (per round) with daunting questions to challenge the student is discouraged.

If the student's answer to a question is not satisfactory, it is critical that the examiner should articulate why. Often, partially correct (or even incorrect) answers may be interpreted differently by the examiner (the answer was wrong) and the student (I was not told I had the wrong answer and I felt I did okay). The down-side of this transaction is the student's psychological reaction. At the end of the examination, areas of strengths and weaknesses may be communicated to the student by the Chair, or delegated to the supervisor for a follow-up discussion with the student.

Assessment of the Outcome:

An *in camera* session will be held immediately following the examination. The outcome of the performance is considered to be satisfactory if the student is deemed to have passed the examination (attaining at a grade of at least 70%). If doubts exist, the committee should articulate any discrepancies in the quality of the performance. If, on the other hand, the consensus or majority assessment is that the student has failed, the committee must recommend a follow-up written qualifying examination.

If the outcome of the subsequent written examination is also unsatisfactory, the committee will request permission from the Dean of the CGPS that a <u>second</u> written qualifying examination be administered. Failure in the second written examination automatically disqualifies the student from further work for a Ph.D. degree (see the CGPS Policy and Procedure Manual at <u>http://www.usask.ca/cgps/policy-and-procedure/index.php</u>).

The AC Chair will communicate the outcome of the examination(s) to all concerned parties.

Timelines:

The qualifying examination should be completed within 12 months after their initiation of the Ph.D. program unless otherwise specified in the letter of offer.

The student should receive guidance and coaching through his/her supervisor(s), committee members, the AC Chair, the Graduate Chair or the Department Head. The examining committee should be consistent in the declaration of the purpose of the examination and its importance. The student should know the exact date in advance (a minimum of 4 weeks' notice). Some designated scope for this exam is required; however, a lengthy absence (months) from research to study for the examination should be discouraged.

Once the AC committee has approved the timing of the qualifying exam, the AC Chair will undertake the formalities of setting the examination process in motion.

2. Administration of the Written Qualifying Examination (where necessary)

The format and implementation of the written qualifying exam will be determined by the Advisory Committee (AC) of the student. <u>The Graduate Chair will coordinate the written examination</u>. General outlines for this examination are given below; however, these may be altered at the discretion of the AC.

The examination will consist of one or two questions per AC member. If the AC consists of more than five members, then the number of questions should be reduced to one per AC member. Questions must be prepared in advance by AC committee members and will be submitted to the Graduate Chair one week prior to the examination. The Graduate Chair will review all questions to determine appropriateness and consistency and may consult with the supervisor or other AC members, if necessary. If the Graduate Chair determines that a question is not suitable, he/she will contact the AC member and a new question will be developed and then will be subjected to the same approval process.

Questions should be selected to provide a balanced coverage of the following areas:

- (A) integration of the student's knowledge derived from coursework taken;
- (B) skills related to development of a research project (e.g., design of a series of experiments based on a particular problem) or explanation of a theory or concept;
- (C) understanding of the general and cognate disciplines of the program of studies (e.g., Food Science or Applied Microbiology)

The student will be provided with an appropriate place to write the exam and will be given up to six hours to complete the exam. Examinations will be closed book. Students will be expected to produce quality answers that follow a logical progression and are supported by sound scientific evidence. Spelling, grammar and appropriate sentence/paragraph structure will be taken into account when answers are graded.

AC members will be responsible for marking their question(s) in a timely manner (five working days) and must provide both a percentage grade and a brief overview of the strengths and weaknesses of the answers provided by the student.

To obtain a pass in the written examination, the student must not receive a failing grade (<70%) from more than one AC member. A student may appeal a failure to the CGPS (see the CGPS Policy and Procedure Manual at http://www.usask.ca/cgps/policy-and-procedure/index.php

Guidelines for the Administration of the Ph.D. Comprehensive Examination

The comprehensive examination is a requirement of the College of Graduate and Postdoctoral Studies (CGPS) for all graduate students enrolled in a Ph.D. program. The objective of the comprehensive examination is to provide students with an opportunity to demonstrate depth and breadth of knowledge relevant to their discipline (e.g., Food Science, Applied Microbiology or Bioproduct Sciences). While it is primarily an assessment tool, it also is an educational opportunity in that it allows the student to consider the broader context of their discipline in society. Students are expected to be able to show their knowledge of the literature, critical appraisal skills, communication skills and knowledge of research methodologies in their field. **The scope of the comprehensive exam is to be broader than the student's specific research area.** As described in the University Calendar, a student must demonstrate that they have **"a mature and substantive grasp of the discipline as a whole"**.

Given successful completion of course work, satisfactory progress in research and a successful performance in the comprehensive exam, the Advisory Committee will recommend the student for acceptance as a fully qualified Ph.D. candidate.

1. Administration of the Ph.D. Oral Comprehensive Examination

Time Limit: 2.5 hours

Examination Questions:

Each member of the examining committee, which may include the Graduate Chair, will have two rounds of questions. Should the Chair choose to participate as a member of the examining committee, this will have been communicated to the student in advance. In the first round, each examiner will have 10-15 minutes. The number of questions asked will depend on the examiner's selection of questions and strategy, the depth of the answers provided by the student, and whether or not others enter the discussion, as another examiner may have had a similar inquiry.

In advance of the examination, each examiner should prepare a list of questions for their own use at the exam. Each examiner's disciplinary area of questioning can be shared with the student, but not the specific questions. The questions raised by the examiner should address the root disciplinary base(s) pertinent to the student's degree program (theories, historic developments, current issues, concepts, methodology, tools, etc.) or related aspects of the area and discipline(s) of science. The candidate, by correctly answering the question, will have demonstrated his/her knowledge base with respect to the subject area. A certain amount of in-depth probing may be appropriate. Such probing may best be left for the second round.

Questioning in the second round will generally be limited to ten minutes or less. The questions may be related to those already raised if the intention is to further probe the depth of understanding or complete a line of questioning. Alternatively, new questions from the examiner's list may be raised. The intent is to ensure that the questions enable the examiner to accurately assess the student's comprehension and understanding of the subject matter, his/her ability to synthesize information and his/her convergent thinking and problem-solving skills. Therefore, the committee members should be thoughtful in the design of their questions. The tendency to raise questions in an *ad hoc* manner or take another's lead is discouraged.

Process:

Once a question has been asked, the student must be given time to gather his/her thoughts and to answer the question. Redirecting or rephrasing the question is permitted and the Chair may clarify the question if necessary. The student may be invited to utilize the white/chalk board or a piece of paper to organize his/her thoughts, or to help explain a concept or theory. If the student is successful in handling a few questions in the first round, the examiner may stop and wait for the second round. Using up the allotted time (per round) with more difficult questions where the student ends up struggling is to be discouraged.

If the student's answer to a question is not satisfactory, it is critical that the examiner should articulate why. Often, partially correct (or even incorrect) answers may be interpreted differently by the examiner (the answer was wrong) and the student (I was not told I had the wrong answer and I felt I did okay). The down side of this transaction is the student's psychological reaction. At the end of the examination, areas of strengths and weaknesses may be communicated to the student by the Chair, or delegated to the supervisor for a follow-up discussion with the student.

Assessment of the Outcome:

An *in camera* session will be held immediately following the examination. The outcome of the performance is considered to be satisfactory if that the student is deemed to have passed the examination (at least a 70% average). If doubts exist, the committee should articulate any discrepancies in the quality of the performance. If, on the other hand, the consensus or majority assessment is that the student has failed, the committee must recommend a follow-up written comprehensive examination.

If the outcome of the subsequent written examination is also unsatisfactory, the committee will request permission from the Dean of the CGPS that a second written comprehensive examination be administered. Failure in the second written examination automatically disqualifies the student from further work for a Ph.D. degree (see the CGPS Policy and Procedure Manual at http://www.usask.ca/cgps/policy-and-procedure/index.php).

The Graduate Chair will communicate the outcome of the examination(s) to all concerned parties.

Timelines:

The comprehensive examination should be completed at least 18 months prior to the expected completion of the Ph.D. program. Generally, the exam will take place at about the two- year point in the program, after course work has been completed and thesis research is well under-way.

The student should receive guidance and coaching through his/her supervisor(s), committee members, the Graduate Chair or the Department Head. The examining committee should be consistent in the declaration of the purpose of the examination and its importance. The student should know the exact date in advance (a minimum of 4 weeks notice). Some dedicated focus to prepare for this exam is required; however, a lengthy absence (months) from research to study for the examination should be discouraged.

Once the AC committee has approved the timing of the comprehensive exam, the Graduate Chair will undertake the formalities of setting the examination process in motion.

2. Administration of the Written Comprehensive Examination (where necessary)

The format and implementation of the written comprehensive exam will be determined by the Advisory Committee (AC) of the student. General outlines for this examination are given below; however, these may be altered at the discretion of the AC.

The examination will consist of one or two questions per AC member. If the AC consists of more than five members, then the number of questions should be reduced to one per AC member. Questions must be prepared in advance by AC committee members and will be submitted to the Graduate Chair one week prior to the examination. The Graduate Chair will review all questions to determine appropriateness and consistency and may consult with the supervisor or other AC members, if necessary. If the Graduate Chair determines that a question is not suitable, he/she will contact the AC member and a new question will be developed and then will be subjected to the same approval process.

Questions should be selected to provide a balanced coverage of the following areas:

- (A) integration of the student's knowledge derived from coursework taken;
- (B) skills related to development of a research project (e.g., design of a series of experiments based on a particular problem) or explanation of a theory or concept;
- (C) understanding of the general and cognate disciplines of the program of studies (e.g., Food Science, Applied Microbiology or Bioproduct Sciences).

The student will be provided with an appropriate place to write the exam and will be given up to six hours to complete the exam. Examinations will be closed book. Students will be expected to produce high quality answers that follow a logical progression and are supported by sound scientific evidence. Spelling, grammar and appropriate sentence/paragraph structure will be taken into account when answers are graded

AC members will be responsible for marking their question(s) in a timely manner (five working days) and must provide to the Graduate Chair both a percentage grade and a brief overview of the strengths and weaknesses of the answer(s) provided by the student.

To obtain a pass in the written examination, the student must not receive a failing grade (<70%) from more than one AC member. A student may appeal a failure to the CGPS (see the CGPS Policy and Procedure Manual at http://www.usask.ca/cgps/policy-and-procedure/index.php

Assignment of chair roles of advisory committee for graduate students

From 2015-2016, the chair roles of advisory committee for graduate student (AC Chair) will be evenly assigned to the faculty members. The items below are principles that will guide these assignments.

1. The advisory committee (AC) chair is assigned to a faculty member. The eligible faculty are tenured and tenuretrack faculty members of Department of Food and Bioproduct Sciences. Department Head and out-of-scope faculty members can choose to be exempt from these assignments. Junior faculties may have fewer assignments.

2. One faculty will continue to chair the AC of a student for their entire program residency. However, the Department Graduate Chair (Grad Chair) may take over the role if complex situations will arise.

3. Each faculty member will be equitably-assigned to M.Sc.- and Ph.D.-level students.

4. According to the forecast of student progress in the program (e.g., PTW, comprehensive exam, and numbers of past advisory committee meetings), the assignment of new student will be proposed by Grad Chair with consultation with the faculty members. Assignment will also consider the interests of potential AC Chair in the student's research fields.

5. When a faculty is not available for a long period of time (e.g., sabbatical leave), the Grad Chair (or a designated faculty) will act as AC Chair.

6. Duties of the AC Chair include:

To chair advisory meetings;

To ensure the students receive proper and timely advice on their research;

- To discuss and complete the student's program of study;
- To monitor that the requirements are met for ethics education, safety training, and progress in program of study;
- To compile and distribute meeting minutes and progress reports, based on the AC meeting discussion;
- To inform Grad Chair if the issues come about the student's study;
- To chair qualifying and comprehensive examinations;
- To chair thesis defence seminar and examination;
- To participate in the defence examination as a part of examination committee according to his/her involvement in the advisory committee (they are expected to get involved with AC actively); and
- To provide the Grad Chair and Graduate Program Assistant copies of all documentation and correspondence to maintain the records in student's file.
- 7. Duties other than listed in item 6 will remain with Grad Chair. They include (but not limited to): Recruitment, selection, admission of graduate students;

Administration of graduate program other than AC meetings and research advice listed in the Policy and Procedure Manual of CGPS;

Represent the department on the College Graduate Affairs Committee;

Participate in the FABS Graduate Affairs Committee;

Scholarships and awards administration

(i.e., All roles defined in the CGPS policy (section 1.2.1) except listed in item 6 of this document.)

Grad Chair may attend AC meetings as an observer.

8. These terms of reference will be annually revisited for amendments.

Guidelines for admission and degree requirements for direct entry Ph.D. students

To be admitted as a direct entry Ph.D. student, students require:

- 1. A four-year honours degree, or equivalent, from a recognized college or university in an academic discipline relevant to the proposed field of study.
- 2. A cumulative weighted average of at least 80% in the last two years of undergraduate study (e.g. 60 credit units of course work).
- 3. Language Proficiency Requirements: Proof of English proficiency may be required for international applicants and for applicants whose first language is not English.
- 4. Demonstrated ability for independent thought, advanced study, and independent research, i.e., solid evidence demonstrating great achievements in academic study and potential for advanced research.

Demonstration of ability (#4) shall be examined using information provided by the student in the application process. The evaluation should take into account, but not be limited to, the following items:

- Course work performance directly related to the research field;
- Past experience in research as evidenced by journal articles, conference presentation, technical reports, patents (applications), undergraduate research thesis, and so on;
- Awards from conferences, meetings, and competitions;
- Strong academic reference letters;
- Scholarship awards for Ph.D. study from recognized funding bodies.

Students who apply for direct entry into a Ph.D. program will provide the information listed above and any other evidence that the student would like to include for consideration. The supervisor and graduate chair will examine the information provided, and, if necessary, will request additional relevant information from the student and/or his/her referees. If they feel the student is qualified, supervisor(s) or Graduate Chair can recommend to the graduate affair committee (GAC) the student be accepted as a direct entry Ph.D. student. The GAC members will examine the materials provided by the student, supervisor and/or graduate chair. The supervisor(s) and/or Graduate Chair may call a GAC meeting to discuss the information before reaching a decision. The GAC will make the recommendation based on the majority of votes to accept the student into the Ph.D. program. The recommendation is forwarded to the department head for the final approval. If the department head disagrees, it should be sent back to GAC for reconsideration.

Degree requirements for a direct entry Ph.D. student are as follows:

Requirements specific to direct entry students are:

- 1. Complete a minimum of 12 CU at the 800-level, 9 CU of which must be completed within the first year of study;
- 2. Pass a qualifying examination that is at least as rigorous as a Master's thesis defense within 12 months of first registration (the administration of the qualifying examination should follow the CGSR policy and the FABS Guidelines for Qualifying Examination);

Other requirements are the same as regular Ph.D. students:

- 3. Pass a comprehensive examination after completing the required course work and prior to focusing on their research and thesis;
- 4. Must maintain continuous registration in the 996 course;
- 5. Must maintain registration in the 990 seminar course in the Fall and Winter terms;
- 6. Complete GSR 960;
- 7. Write and defend a thesis based on original research.