FOOD 531 (6 credits) - Food Research Project
Integration of the principles of research relevant to the food industry. (0-0-6)

Course Objective: This is a capstone course for the professional Masters of Food Science degree. This course provides a means of integrating the various theoretical aspects of food production, regulation, and marketing covered in other courses required for the degree, and provides students with an opportunity to gain research experience in an area that will be relevant to their future employment.

Course Description: Students, as individuals or as members of a small group, will address a research problem, by performing background literature research, experimentation, and data interpretation, under the direction of an experienced researcher or a Faculty member. The project outcome will be presented as an individual written report. The report will be evaluated by an experienced researcher, approved as instructors or research project supervisors for FOOD 531.

Learning Outcomes
Upon successful completion of this course, students will be able to:

- Apply principles of product development, production, food processing, food analysis, food safety, and/or regulation and marketing of food, as required by the project
- Critically evaluate scientific literature
- Show a depth of understanding, appropriate to a graduate student, in the areas relevant to the project
- Design and conduct experiments and perform appropriate statistical analysis of data
- Communicate scientific data effectively using oral and written skills.

Course Organization and Delivery:
Students will be assigned projects individually or as part of a research team of two or three depending on the project. Students are encouraged to suggest projects involving companies, institutions, or government agencies that coincide with their own interests or career goals. The MFS will consider all such opportunities that meet the requirements of the course. In different circumstances, students may fulfill the requirements of FOOD 531 while holding either paid or unpaid positions with the research facility, provided the student is able to devote at least 20 hours per week during regular working hours to the research project. Please contact the MFS Director or the MFS Academic Advisor for more information and clarification of these points.

Each student or group will be assigned an appropriate project, that will have been proposed by or known to be relevant to the food industry in Canada or internationally. The project may involve product formulation, process development, quality assurance, and analysis of chemical, physical, nutritional or sensory properties, food marketing, food regulation, consumer perceptions, or other projects judged relevant to the goals of the course, at the discretion of the MFS Director.

Students will work with an experienced researcher or Food Science faculty member and, if appropriate, an industry supervisor. The work performed by the student will ideally provide experience in working on a multi-faceted problem of current interest to industry in Canada or internationally. It will involve formulating the problem, literature search to research the problem, developing detailed methodology, carrying out the research, analyzing results, and presenting progress reports and final results in oral and written form. The written report will be made available to the industry supervisor.

The course typically runs over 14 weeks, from May through August.

Responsibilities of the Academic Supervisor and Industry Supervisor

- Selection of the appropriate research project in conjunction with the student
- Provision of suitable laboratory or pilot plant supplies and equipment to perform the work
- Providing guidance on experimental design, data analysis, and presentation of the results
- Scheduling of regular/weekly meetings with the student
- Giving feedback on the project proposal draft in a timely manner
- Evaluating the student lab work and report write-up
- Note: the role of the supervisor in the written report should be restricted to:
    - Provide general recommendations regarding structure, development, and progression of idea;
    - Provide advice on the general format of the report according to the guidelines, and the use of correct grammar, spelling, and sentence structure.

  The involvement of the supervisor should be limited to the first draft of the project proposal.

Responsibilities of the Student

- Make arrangements to work under the guidance of a faculty member and/or industry supervisor as the project supervisor
- Strict adherence to deadlines and guidelines for the course, as stated in this document and arranged with your supervisor
- Submit copies of your project proposal to your project supervisor and the academic advisor by May 16. This brief (one or two pages) project proposal should state or explain your understanding of:
    - The hypothesis and objectives of your project (the idea that you are testing)
    - The significance of your project (why it is of interest or importance to the food industry)
    - The approach you will use to test the project (the general procedure)
    - The time frame for the work (the steps or progress you expect to complete each month)
    - The potential problems or difficulties you might encounter in the project
- Allocate appropriate time to this course over May to August
- Submit a brief (one or two pages) progress report to the project supervisor and the academic advisor. This report should state:
    - Major accomplishments in the work to that time
    - Major problem in the project
    - Significant changes in the aim or approach for the project
    - Remaining experiments that you expect to complete before writing up the final project report
- Submission of a bound copy of the final report to academic supervisor for evaluation by August 15.

Suggested Timeline

- Week 1, May 1 to 9: Introduction to the course, research supervisor and/or faculty member; definition of the research problem
- Week 2, May 12 to 16: Development of the scope of the project and background research by students; approval of research approach by the industry supervisor and academic supervisor; laboratory safety orientation
- Week 3 – 11, May 19 to July 18: Data collection
- Week 11 -13, July 21 to August 1: Data analysis and preparation of written report; if necessary, submission of first draft of written report to academic supervisor for feedback
- Week 15, August 15: Individual written report due

Course Evaluation

For purposes of determining a grade for the written report, evaluation will be conducted by the academic supervisor. Where feasible and necessary, a common standing review committee will be struck. Evaluation of the course will be based on the organization and conduct of the project work and the written report.

One suggestion for an evaluation is given below. This scheme may be modified by the supervisor.

<u>Goal Setting Project Proposal</u>

- 10% of the course grade
- Due date: May 16
- To be completed by student and evaluated by industry supervisor and academic supervisor
- The proposal will be evaluated based on the following areas:
    - Project Description (20%)
    - Technical Goals (20%)
    - Planning and Approaches (40%)
    - Organization and language of the reports (clarity and conciseness, grammar, etc) (20%)

<u>Work Performance Evaluation Forms</u>

- Completed by industry supervisor
- Two reports, 10% each for a total of 20% of the course grade
- Suggested submission dates: End of June and end of August
- A form to be completed by industry supervisor to assess the student's ability to handle the research project:
    - Technical Skills
    - Communication Skills
    - Organizational Skills
    - Interpersonal Skills
    - Initiative

Progress Report

- 5% of the course grade
- Due date: End of June
- Student submit a brief (one or two pages) progress report to the project supervisor and the academic advisor. This report should state:
    - Major accomplishments in the work to that time
    - Major problem in the project
    - Significant changes in the aim or approach for the project
    - Remaining experiments that you expect to complete before writing up the final project report

Final Report

- 65% of course grade
- Due date: August 15
- A report and/or an oral presentation prepared by the student

Student Goal Setting Proposal Guidelines

In maximum 2 pages, students should provide the following:

Project Description (20%): A general description of practicum project and research to be performed, include references where applicable

Planning and Approaches (40%): Methods or techniques to be applied and target completion dates.

Technical Goals (20%): A list of goals / expected primary learning outcomes the student expects to gain during this work term. The student should also identify expected results and success criteria and how this work can contribute to the success of the industry.

The proposal should be written in a concise and organized manner free from grammatical errors and typos. The language and structural aspects of the report will worth up to 20% of the proposal grade.

Final Report Write-up Guidelines

The following items are suggestions as to the write up of reports. For specific items, the academic supervisor should be consulted.

Each report should contain, in the order given, the following sections:

Title page: This page contains the title, author's name, a statement as follow: "A thesis submitted in partial fulfillment of the requirements for the degree of Master of Food Science", and the date (see example attached).

Abstract (5%): this is a condensation of the contents of the report, usually 200 words or less, giving significant information in the report. It serves as a quick reference to determine if the thesis contains information a person is looking for. No abbreviation should be used in this section.

Table of Contents: This should list all major and subheadings accompanied by the pages on which they are found (see example attached).

List of Tables: The table number, caption and page on which it is found are listed.

List of Figures: The figure number, legend and page on which it is found are listed.

Acknowledgements: This section expresses thanks and appreciation to individuals, institutions or organizations that were particularly helpful in the carrying out of the thesis work. This section is optional.

Introduction, Statement of Objectives (5%): The introduction outlines to the reader the report subject, its importance, presents the specific problem of the practicum project and indicates the nature of the investigation carried out. It should also provide a clear outline of the hypotheses, rationale, objectives, and specific goals of the project.

Literature Review (15%): This section generally outlines or discusses findings reported by others in books and journals, relating to and leading to the proposed investigation as related in the report.

Materials and Methods (15%): This section should describe the experimental procedures employed, newly developed methods, citation of appropriate references for methods not performed by the students themselves, sources of materials and chemicals used, the equipment and facilities used, and methods/software used for data analysis, in a manner which would allow others to duplicate the work.

Results (10%): This section presents data solely generated by the student during the practicum project in figures and/or tables in a manner that is commonly used in research publications. Statistical significance of data should also be included. The format for tables and figures should be as in the Journal of Food Science.

Discussion (30%): The section relates the information, experimental data, or observations resulting from the study and describes the findings logically. The student should demonstrate critical analysis of results and comprehension of the subject area.

The Result and Discussion sections can be written as a combination of the two or as separate entities.

Conclusion: This section reports the conclusions reacted on the basis of evidence presented in the discussion. This may often be combined with a concise summation of results given throughout **Results** and **Discussion.**

References: This should include a listing of al literature cited in the report. The format to be used for citing in the report body and listing at the end should that of the Journal of Food Science.

Appendix: Appendices are repositories for details that must be recorded because they may be needed, but would slow the reader down unnecessarily if placed in the body of the report. Appendix materials must be referred to in the body of the report. Calculations, detailed analyses and test figures are typical material found in this section.

The report should be written in a concise and organized manner free from grammatical errors and typos. The language and structural aspects of the report will worth up to 20% of the report grade.

In addition, the report should be typed and printed on good quality bond paper. At total of two copies should be made: one for the industry supervisor and one for the academic supervisor. The copy to be submitted to the academic supervisor may be good quality photocopies. Both copies should be bound in suitable binders such as Duo-tang, Acco-press binder, or coil bound.

(Title page example)

Title of the Project

By

Your name

A Report Submitted in Partial Fulfillment for the
Requirements for the Degree of Master of Food Science

Food Science

Faculty of Graduate Studies

The University of British Columbia

August 2008