



ANSC*3170 Nutrition of Fish and Crustacea

Winter 2019

Section(s): C01

Department of Animal Biosciences

Credit Weight: 0.50

Version 2.00 - January 07, 2019

1 Course Details

1.1 Calendar Description

This course examines growth, digestive and metabolic processes, nutritional requirements and practical feeding programs for fish and crustaceans with an emphasis on those species used in aquaculture.

Pre-Requisite(s): NUTR*3210

1.2 Course Description

The course will provide the student with a broad overview of the state-of-the-art on nutrition and feeding of fishes and crustaceans from an aquaculture perspective.

The course will also help the students cultivate the skills needed to be able to understand, search, and critically evaluate information on nutrition of fishes and crustaceans, and subsequently use this information to address various practical issues and challenges in aquaculture.

1.3 Timetable

Lectures on Tuesdays, Thursdays at 10:00 a.m. - 11:20 a.m. in MCKN 115.

1.4 Final Exam

The final exam will be in class on 4 April 2019.

2 Instructional Support

2.1 Instructional Support Team

Instructor: Dominique Bureau

Email: dbureau@uoguelph.ca
Telephone: +1-519-824-4120 x53668
Office: ANNU 136
Office Hours: Tuesday 11:30 a.m. - 12:30 p.m. and Thursday 11:30 a.m. – 12:30 p.m. or by appointment (contact by email to schedule).

Email inquiries are preferred and generally answered rapidly.

2.2 Teaching Assistant(s)

Teaching Assistant: Flavia Damasceno
Email: fdamasce@uoguelph.ca
Telephone: 519-824-4120 ext. 56688
Office: ANNU 047
Office Hours: Monday 1:00 - 2:00 p.m.; Wednesday 1:00 – 2:00 p.m.

Teaching Assistant: Fatemeh Nemati Shizari
Email: fnematis@uoguelph.ca
Telephone: 519-824-4120 ext. 56688
Office: ANNU 047
Office Hours: Tuesday 1:00 - 2:00 p.m.; Thursday 1:00 – 2:00 p.m.

3 Learning Resources

3.1 Additional Resource(s)

Electronic copy of handout (copies of the PPT slides) and other material will be posted on a weekly basis on the course website. (Other)

4 Learning Outcomes

4.1 Course Learning Outcomes

By the end of this course, you should be able to:

1. Literacy: Students will be required to critically review and understand the up-to-date scientific information on fish nutrition compiled in course notes and lecture material (power point slides). The students will also be required to review scientific papers and technical documents, comprehend and present ideas and research findings into an imposed format.
2. Understanding of Forms of Inquiry: A major theme of this course will pertain to the process whereby information is searched in a variety of source to achieve a series of tasks with strong practical applications.
3. Depth and Breadth of Understanding: This course will cross several conventional discipline boundaries within the broad areas of nutrition, metabolism, physiology,

- chemistry, aquaculture, natural history and biology of fish, environmental biology, feed technology, etc. Students will be encouraged to go beyond material discussed in class.
4. Independence of Thought: Emphasis will be placed on identifying and understanding the basis for current viewpoints. Inevitably, this results in challenges to orthodoxy.
 5. Love of Learning: This course will be aimed at helping students to distinguish between education and training, and to ascribe value to both.

4.2 Specific Learning Outcomes

1. Review nutrition and feeding in the context of the conversion of dietary inputs into aquatic animal biomass and marketable products under controlled conditions (aquaculture context).
2. Develop an understanding of the basic digestive, physiological and metabolic processes in fish and crustaceans that are relevant to nutrient utilization.
3. Learn to follow and identify the fate of ingested nutrients and understand the basis of their essentiality, deficiency signs, and interactions between nutrients and/or different dietary components.
4. Develop an understanding growth processes and factors affecting growth, and learning how to describe and analyze growth performance of fish and crustaceans using simple mathematical equations.
5. Learn about some of the methods and protocols commonly used in fish nutrition research.
6. Compare approaches for establishing nutrient requirements, nutritional specifications, and feed formulation guidelines and be able to discuss some of the limitations and implications of these approaches.
7. Learn about feed ingredients, their origin, and the factors affecting their quality and nutritive value.
8. Learn about formulation and manufacturing artificial diets (feeds) suitable for fish and crustaceans production.
9. Be exposed to current and emerging issues in aquaculture (environmental impacts, product quality and safety, profitability, etc.) upon which nutrition and feeding may have major impacts/effects.
10. Acquire some of the skills needed to be able to effectively gather, integrate and analyze scientific and practical information and use this information to develop practical applications for aquaculture and fisheries management.

5 Teaching and Learning Activities

5.1 Lecture

Tue, Jan 8 Topic(s):	Introduction to Course - Module 1: Feeds & Feeding in Aquaculture
Thu, Jan 10 Topic(s):	Module 1: Feeds & Feeding in Aquaculture (Cont'd) + Tutorial Task #1
Tue, Jan 15 Topic(s):	Module 2: Nutritional Concepts
Thu, Jan 17 Topic(s):	Module 2: Nutritional Concepts (Cont'd) + Tutorial Task #2
Tue, Jan 22 Topic(s):	Module 3: Growth Biology
Thu, Jan 24 Topic(s):	Module 3: Growth Biology (Cont'd) + Task #3 Tutorial
Tue, Jan 29 Topic(s):	Module 4: Digestion
Thu, Jan 31 Topic(s):	Module 4: Digestion – Digestibility
Tue, Feb 5 Topic(s):	Module 5: Nutritional Energetics
Thu, Feb 7 Topic(s):	Guest Lecture: Prof. R.D. Moccia. Feeding and Water Quality Management in Aquaculture
Tue, Feb 12 Topic(s):	Mid-Term Exam (in class)
Thu, Feb 14 Topic(s):	Practical Session: Feed Ingredients and Feed Manufacturing
Tue, Feb 19 Topic(s):	Reading Week / No Class
Thu, Feb 21	

Topic(s):	Reading Week / No Class
Tue, Feb 26	
Topic(s):	Module 6: Protein and Amino Acids - Task #4 Tutorial
Thu, Feb 28	
Topic(s):	Module 6: Proteins and Amino Acids (Cont'd)
Tue, Mar 5	
Topic(s):	Module 7: Lipids
Thu, Mar 7	
Topic(s):	Module 7 Lipids (Contd) + Tutorial Task #5
Tue, Mar 12	
Topic(s):	Module 8 : Carbohydrates
Thu, Mar 14	
Topic(s):	Module 9: Vitamins and Carotenoid Pigments
Tue, Mar 19	
Topic(s):	Module 10: Minerals
Thu, Mar 21	
Topic(s):	Module 11: Aquaculture Feed Manufacturing
Tue, Mar 26	
Topic(s):	Module 12: Nutritional Management of Waste Outputs and Environmental Impacts
Thu, Mar 28	
Topic(s):	Module 13: Broodstock and Early-Life Nutrition
Tue, Apr 2	

Topic(s): Practical Session: Nutrition Research Techniques

Thu, Apr 4

Topic(s): Final Exam (in class)

5.2 Tentative Dates

All dates except exams are tentative as of 3 January 2019

5.3 Laboratory Practical Sessions

Two practical sessions (labs) will be offered. Each practical will include a very brief evaluation worth 5% of the final mark. Details on the practical sessions will be provided in class.

6 Assessments

6.1 Marking Schemes & Distributions

Term Project (five tasks) = 45%

Practical Sessions (two sessions) = 10%

Mid-Term Exam (in class) = 20%

Final Exam (in class) = 20%

Take Home Exam Question = 5%

6.2 Assessment Details

Term Project - Five Tasks (45%)

Date: Tue, Jan 8 - Thu, Apr 4

Learning Outcome(s): 1,2,3,4,5

Five different tasks (assignments) with various due dates.

Due dates: Task 1: Jan. 22, 2019 (5%); Task 2: Jan. 31, 2019 (10%); Task 3: Feb.28, 2019 (10%); Task 4: March 14, 2019 (10%); Task 5: Apr. 2, 2019 (10%).

Detailed instructions on how to complete the five tasks are provided in a document posted on the course website. Tutorial sessions will be offered for each tasks. The teaching assistants will be available several hours every week to guide and assist the students with the completion of the tasks.

Practical Sessions (2) (10%)

Learning Outcome(s): 2,5

Various times; 2 sessions worth 5% each.

Practical Session #1 will focus on feed ingredients and feed manufacturing

Practical Session #2 will focus on fish nutrition research techniques and equipment.

Midterm (20%)

Date: Tue, Feb 12, In class

Learning Outcome(s): 3,4,5

Mid-term exam covering material reviewed in class from January 8, 2018 to Feb 7, 2019. Eight to 10 questions with short and medium length answers. No calculations required.

Final Exam (20%)

Date: Thu, Apr 4, In class

Learning Outcome(s): 3,4,5

Final exam covering material reviewed in class from February 26, 2019 to April 2, 2019. Not cumulative. Eight to 10 questions requiring short (i.e. a few words) to medium length (i.e. a few lines) answers. No calculations.

Take Home Question (5%) (0%)

Date: Tue, Mar 26 - Fri, Apr 12, Home

Take home exam involving one essay-style question. Answer to be returned by email to instructor before 12 April 2019.

7 Course Statements

7.1 Grading Policies

Assignments (tasks) and exams will be graded in a timely fashion (within 10 days) and they returned to the students (except the final exam) with either personalized feedback or general feedback in class to highlight some of the shortcomings in the students' work or understanding of the concepts.

Assignments (term project tasks) must be submitted by 11 p.m. on the due date. Assignments submitted late will be subjected to 10% penalty per day late.

8 University Statements

8.1 Email Communication

As per university regulations, all students are required to check their e-mail account regularly: e-mail is the official route of communication between the University and its students.

8.2 When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. The grounds for Academic Consideration are detailed in the Undergraduate and Graduate Calendars.

Undergraduate Calendar - Academic Consideration and Appeals

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml>

Graduate Calendar - Grounds for Academic Consideration

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

8.3 Drop Date

Courses that are one semester long must be dropped by the end of the fortieth class day; two-semester courses must be dropped by the last day of the add period in the second semester. The regulations and procedures for course registration are available in the Undergraduate and Graduate Calendars.

Undergraduate Calendar - Dropping Courses

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml>

Graduate Calendar - Registration Changes

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/genreg-reg-regchg.shtml>

8.4 Copies of Out-of-class Assignments

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

8.5 Accessibility

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required; however, interim accommodations may be possible while that process is underway.

Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability.

Use of the SAS Exam Centre requires students to book their exams at least 7 days in advance and not later than the 40th Class Day.

More information can be found on the SAS website

<https://www.uoguelph.ca/sas>

8.6 Academic Integrity

The University of Guelph is committed to upholding the highest standards of academic integrity, and it is the responsibility of all members of the University community-faculty, staff, and students-to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff, and students have the responsibility of supporting an environment that encourages academic integrity. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

Undergraduate Calendar - Academic Misconduct

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml>

Graduate Calendar - Academic Misconduct

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

8.7 Recording of Materials

Presentations that are made in relation to course work - including lectures - cannot be recorded or copied without the permission of the presenter, whether the instructor, a student, or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

8.8 Resources

The Academic Calendars are the source of information about the University of Guelph's procedures, policies, and regulations that apply to undergraduate, graduate, and diploma programs.

Academic Calendars

<https://www.uoguelph.ca/academics/calendars>