ANSC*3170 Nutrition of Fish and Crustacea

Winter 2023
Section(s): C01

Department of Animal Biosciences
Credit Weight: 0.50
Version 1.00 - January 09, 2023

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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-Requisites: 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 11:30 a.m. - 12:50 p.m. in person in ANNU 156 or online using Zoom. See Courselink for the link to Zoom meeting. All lectures will be recorded and posted can be accessed asynchronously if needed.. All evaluations can be done asynchronously (within the defined timeframe and specific deadlines of each task, quiz or exam).

1.4 Final Exam

Take home final exam.

Exam will be open book, on Courselink. Opens: April 8, 2023 - Due: April 16, 2023.

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2 Instructional Support

2.1 Instructional Support Team

Instructor: Dominique Bureau
Email: dbureau@uoguelph.ca
Telephone: +1-519-241-5533
Office: Online
Office Hours: Video conference by appointment. Contact by email to schedule.

Email inquiries are preferred and generally answered rapidly.

2.2 Teaching Assistants

Teaching Assistant (GTA): Kathryn Kroeze
Email: kkroeze@uoguelph.ca

Teaching Assistant (GTA): Samantha Hartwig
Email: shartwig@uoguelph.ca

2.3 Communicating with your Instructor

During the course, your instructor will interact with you on various course matters on the course website using the following ways of communication:

- **Announcements:** The instructor will use **Announcements** on the Course Home page to provide you with course reminders and updates. Please check this section frequently for course updates from your instructor.
- **Ask Your Instructor Discussion:** Use this discussion forum to ask questions of your instructor about content or course-related issues with which you are unfamiliar. If you encounter difficulties, the instructor is here to help you. Please post general course-related questions to the discussion forum so that all students have an opportunity to review the response. To access this discussion forum, select **Discussions** from the **Tools** dropdown menu.
- **Email:** If you have a conflict that prevents you from completing course requirements, or have a question concerning a personal matter, you can send your instructor a private message by email. The instructor will attempt to respond to your email within 24 hours.
- **Video Call:** If you have a complex question you would like to discuss with your instructor, you may book a video meeting on Teams (or alternate platform being used by your instructor). Video meetings depend on the availability and are booked on a first come first served basis.

2.4 Netiquette Expectations

Online Behaviour
Inappropriate online behaviour will not be tolerated. Examples of inappropriate online behaviour include:

- Posting inflammatory messages about your instructor or fellow students
- Using obscene or offensive language online
- Copying or presenting someone else's work as your own
- Adapting information from the Internet without using proper citations or references
- Buying or selling term papers or assignments
- Posting or selling course materials to course notes websites
- Having someone else complete your quiz or completing a quiz for/with another student
- Stating false claims about lost quiz answers or other assignment submissions
- Threatening or harassing a student or instructor online
- Discriminating against fellow students, instructors and/or TAs
- Using the course website to promote profit-driven products or services
- Attempting to compromise the security or functionality of the learning management

system

· Sharing your user name and password

· Recording lectures without the permission of the instructor

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3 Learning Resources

3.1 Additional Resources

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

3.2 Course Technology and Technical Support

System and Software Requirements

This course will use a variety of technologies including;

- CourseLink (main classroom)
- Zoom
- Teams (via Office 365)

To help ensure you have the best learning experience possible, please review the list of system and software requirements.

https://opened.uoguelph.ca/student-resources/system-and-software-requirements

CourseLink System Requirements

You are responsible for ensuring that your computer system meets the necessary system requirements. Use the browser check tool to ensure your browser settings are compatible and up to date. (Results will be displayed in a new browser window).

http://spaces.uoguelph.ca/ed/system-requirements/
https://courselink.uoguelph.ca/d2l/systemCheck

CourseLink

This course is being offered using CourseLink (powered by D2L's Brightspace), the University of Guelph's online learning management system (LMS). By using this service, you agree to comply with the University of Guelph's Access and Privacy Guidelines. Please visit the D2L website to review the Brightspace privacy statement and Brightspace Learning Environment web accessibility standards.

http://www.uoguelph.ca/web/privacy/ https://www.d2l.com/legal/privacy/
https://www.d2l.com/accessibility/standards/

Technical Support

If you need any assistance with the software tools or the CourseLink website, contact CourseLink Support.

Email: courselink@uoguelph.ca

Tel: 519-824-4120 ext. 56939 Toll-Free (CAN/USA): 1-866-275-1478

Support Hours (Eastern Time):

Monday thru Friday: 8:30 am–8:30 pm

Saturday: 10:00 am–4:00 pm

Sunday: 12:00 pm–6:00 pm

Teams (via Office 365)

Office 365 Teams is a collaboration service that provides shared conversation spaces to help teams coordinate and communicate information. This course will use Teams for one on one meetings with your Instructor. It is recommended that you use the desktop version of Teams. As a student you are responsible for learning how to use Teams and it's features.

For Teams Support visit the CCS website for more information.

https://www.uoguelph.ca/ccs/services/office365/teams

Zoom

This course will use Zoom for lectures. Check your system requirements to ensure you will be able to participate.

https://opened.uoguelph.ca/student-resources/system-and-software-requirements

3.2 Technical Skills

As part of your learning experience, you are expected to use a variety of technologies for assignments, lectures, teamwork, and meetings. In order to be successful in this course you will need to have the following technical skills:

- Manage files and folders on your computer (e.g., save, name, copy, backup, rename, delete, and check properties);
- Install software, security, and virus protection;
- Use office applications (e.g., Word, PowerPoint, Excel, or similar) to create documents;
- Be comfortable uploading and downloading saved files;
- Communicate using email (e.g., create, receive, reply, print, send, download, and open attachments);
- Navigate the CourseLink learning environment and use the essential tools, such as Dropbox, Quizzes, Discussions, and Grades (the instructions for this are given in your course);
- Access, navigate, and search the Internet using a web browser (e.g., Firefox, Internet Explorer); and
- Perform online research using various search engines (e.g., Google) and library databases.

3.2 Library Access

As a student, you have access to the University of Guelph's library collection, including both physical and electronic materials. For information on checking out or couriering physical library items, accessing electronic journals and returning items to the library, visit the library's website.

If you are studying off campus and would like to access the library's electronic resources, use the Off Campus Login and login using your Single Sign On credentials or using your last name and library barcode.

https://www.lib.uoguelph.ca/

https://www.lib.uoguelph.ca/campus-login

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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.

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5 Teaching and Learning Activities

5.1 Lecture

Tue, Jan 10

Topics:

Class held online only and recorded (as all the other classes will be).

Introduction to Course, Instructor and Teaching Assistants (TAs)

Introduction to Term Project - Tutorial for Task 1

Thu, Jan 12

Topics:

Class recorded only. No in person or synchronous online class.

Module 1: Feeds & Feeding in Aquaculture

Tue, Jan 17

Topics:

Class recorded only. No in person or synchronous online class.

Module 2: Nutritional Concepts.

Thu, Jan 19

Topics: First in person class. Also online and recorded.

Module 2: Nutritional Concepts (Cont'd)

Tutorial Task #2

Tue, Jan 24

Topics: Module 3: Growth Biology

Thu, Jan 26

Topics: Module 3: Growth Biology (Cont'd)

Tutorial Task #3

Tue, Jan 31

Topics: Module 4: Digestion

Thu, Feb 2

Topics: Module 4: Digestion – Digestibility

Tue, Feb 7

Topics: Module 5: Feed Ingredients and Feed Manufacturing

Thu, Feb 9

Topics: Module 6 Nutritional Energetics

Tue, Feb 14

Topics: Module 7: Protein and Amino Acids

Thu, Feb 16

Topics: Module 7 Protein and Amino Acids (Cont'd)

Tutorial Task #4

Tue, Feb 21

Topics: Reading Week - No class

Thu, Feb 23

Topics: Reading Week - No class

Tue, Feb 28

Topics: Guest Lecture - TBD

Thu, Mar 2

Topics: Module 8: Lipids

Tue, Mar 7

Topics: Module 8: Lipids (Cont'd)

Tutorial Task 5

Thu, Mar 9

Topics: Module 9: Carbohydrates

Tue, Mar 14

Topics: Module 10: Vitamins

Thu, Mar 16

Topics: Module 11: Minerals

Tue, Mar 21

Topics: Module 13: Nutrition and Health

Thu, Mar 23

Topics: Module 14: Nutritional Management of Waste Outputs and Environmental Impacts

Tue, Mar 28

Topics: Module 15: Nutrition and Final Product Composition and

Quality

Thu, Mar 30

Topics: Panel: Professionals share their career experience in aquaculture and animal nutrition

Tue, Apr 4

Topics: Module 16: Broodstock and Larval Nutrition

Thu, Apr 6

Topics: Module 17: Monitoring and benchmarking aquatic animal performance in the field

5.2 Tentative Dates

All dates for the different modules are tentative.

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6 Assessments

6.1 Marking Schemes & Distributions

Term Project (six tasks) = 50%

Quiz #1 = 15%

Quiz #2 = 10%

Take-Home Final Exam = 25%

Name	Scheme A (%)
Term Project - Task 0 Species Selection & Approval	5
Term Project - Task 1: Reference List	5
Term Project - Task 2: Production Outline	10
Term Project - Task 3: Growth Modeling	10
Term Project - Task 4: Feed Formulation	10
Term Project - Task 5: Feed Requirement and Waste Outputs Modeling	10

Name	Scheme A (%)
Quiz #1 (online)	15
Quiz #2 (online)	10
Final Take-Home Exam	25
Total	100

6.2 Assessment Details

Term Project - Task 0 Species Selection & Approval (5%)
Date: Sun, Jan 22
Learning Outcome: 1, 2, 3, 4, 5
Detailed instructions on how to complete the six tasks are provided in a document posted on the course site on Courselink. 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.

Term Project - Task 1: Reference List (5%)
Date: Tue, Jan 31, 11:00 PM
Learning Outcome: 1, 2, 3, 4, 5
Detailed instructions on how to complete the six 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.

Term Project - Task 2: Production Outline (10%)
Date: Tue, Feb 7, 11:00 PM
Learning Outcome: 1, 2, 3, 4, 5
Detailed instructions on how to complete the six 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.

Term Project - Task 3: Growth Modeling (10%)
Date: Tue, Feb 28, 11:00 PM
Learning Outcome: 1, 2, 3, 4, 5
Detailed instructions on how to complete the six 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.

Term Project - Task 4: Feed Formulation (10%)
Date: Tue, Mar 14, 11:00 PM
Learning Outcome: 1, 2, 3, 4, 5
Detailed instructions on how to complete the six 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.

Term Project - Task 5: Feed Requirement and Waste Outputs Modeling (10%)
Date: Tue, Apr 4, 11:00 PM
Learning Outcome: 1, 2, 3, 4, 5
Detailed instructions on how to complete the six 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.

Quiz #1 (15%)
Date: Fri, Feb 10, 12:00 PM - Fri, Feb 17, 11:59 PM, Courselink
Learning Outcome: 3, 4, 5
Short online quiz covering material from January 10th to Feb 09th, 2023. The quiz will have up to 20 multiple choice questions. The exam will be open-book and can be done over a 3h period,

Quiz #2 (10%)
Date: Fri, Mar 10, 12:00 PM - Sun, Mar 19, 11:59 PM, Courselink
Learning Outcome: 3, 4, 5
Short online quiz covering material from Feb 14th to March 9, 2023. The quick will have up to 20 multiple choice questions. The exam will be online, open-book and students will have a period of 3h to complete.

Final Exam (25%)
Date: Sat, Apr 8, 12:00 AM - Sun, Apr 16, 11:59 PM, Take-home open book - On Courselink
Learning Outcome: 3, 4, 5
Take-home final exam covering material for the entire course. Approximately 15 multiple-choice questions and two long (i.e. 10-15 sentences) answers. The questions will emphasize a wholesome understanding of the topics covered in class and application to real-life problems or scenarios. The exam will be online, open-book and students will have the entire period the exam is open to complete.

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7 Course Statements

7.1 Grading Policies

Assignments (tasks) will be graded in a timely fashion (within 10 days) and they returned to the students (except for the final take-home exam) with either personalized feedback and 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 11:59 p.m. on the due date or indicated otherwise. Assignments submitted late with be subjected to 10% penalty per day late.

7.2 Dropbox Submissions

Assignments should be submitted electronically via the online **Dropbox** tool. When submitting your assignments using the **Dropbox** tool, do not leave the page until your assignment has successfully uploaded. To verify that your submission was complete, you can view the submission history immediately after the upload to see which files uploaded successfully. The system will also email you a receipt. Save this email receipt as proof of submission.

Be sure to keep a back-up copy of all of your assignments in the event that they are lost in transition. In order to avoid any last-minute computer problems, your instructor strongly recommend you save your assignments to a cloud-based file storage (e.g., OneDrive), or send to your email account, so that should something happen to your computer, the assignment could still be submitted on time or re-submitted.

It is your responsibility to submit your assignments on time as specified on the Schedule. Be sure to check the technical requirements and make sure you have the proper computer, that you have a supported browser, and that you have reliable Internet access. Remember that **technical difficulty is not an excuse not to turn in your assignment on time.** Don't wait until the last minute as you may get behind in your work.

If, for some reason, you have a technical difficulty when submitting your assignment electronically, please contact your instructor or CourseLink Support.

http://spaces.uoguelph.ca/ed/contact-us/

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

Associate Diploma Calendar - Academic Consideration, Appeals and Petitions
https://www.uoguelph.ca/registrar/calendars/diploma/current/index.shtml

8.3 Drop Date

Students will have until the last day of classes to drop courses without academic penalty. The deadline to drop two-semester courses will be the last day of classes in the second semester. This applies to all students (undergraduate, graduate and diploma) except for Doctor of Veterinary Medicine and Associate Diploma in Veterinary Technology (conventional and alternative delivery) students. The regulations and procedures for course registration are available in their respective Academic 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

Associate Diploma Calendar - Dropping Courses
https://www.uoguelph.ca/registrar/calendars/diploma/current/c08/c08-drop.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 make a booking at least 14 days in advance, and no later than November 1 (fall), March 1 (winter) or July 1 (summer). Similarly, new or changed accommodations for online quizzes, tests and exams must be approved at least a week ahead of time.

For Guelph students, information can be found on the SAS website

https://www.uoguelph.ca/sas

For Ridgetown students, information can be found on the Ridgetown SAS website
https://www.ridgetownc.com/services/accessibilityservices.cfm

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

8.9 Disclaimer

Please note that the ongoing COVID-19 pandemic may necessitate a revision of the format of

course offerings, changes in classroom protocols, and academic schedules. Any such changes will be announced via CourseLink and/or class email.

This includes on-campus scheduling during the semester, mid-terms and final examination schedules. All University-wide decisions will be posted on the COVID-19 website (https://news.uoguelph.ca/2019-novel-coronavirus-information/) and circulated by email.

8.10 Illness

Medical notes will not normally be required for singular instances of academic consideration, although students may be required to provide supporting documentation for multiple missed assessments or when involving a large part of a course (e.g.. final exam or major assignment).

8.11 Covid-19 Safety Protocols

For information on current safety protocols, follow these links:

- https://news.uoguelph.ca/return-to-campuses/how-u-of-g-is-preparing-for-your-safe-return/
- https://news.uoguelph.ca/return-to-campuses/spaces/#ClassroomSpaces

Please note, these guidelines may be updated as required in response to evolving University, Public Health or government directives.
