

NEMATODE MORPHOLOGY AND ANATOMY

NEM 6101 (LECTURE) 2 CREDIT HOURS

LOCATION: ONLINE. PLEASE NOTE THAT CLASS RESOURCES, ANNOUNCEMENTS, AND ASSIGNMENTS WILL BE MADE AVAILABLE THROUGH THE CLASS CANVAS SITE.

FALL 2022

INSTRUCTOR: Dorota Porazinska

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email: dorotalp@ufl.edu (but please communicate via Canvas email)

OFFICE HOURS: Please send me a Canvas email anytime to schedule a zoom meeting.

COURSE TA OR COORDINATOR:

Kaitlin Gattoni
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communicate via Canvas email)

“Consider the nematode roundworm, the most abundant of all animals. Four out of five animals on Earth are nematode worms – if all solid materials except nematode worms were to be eliminated you could still see the ghostly outline of the most of it in nematode worms.” E. O. Wilson (*paraphrasing N. A. Cobb*)

COURSE DESCRIPTION: The course provides advanced knowledge on morphology and anatomy of free-living, plant-parasitic, and animal-parasitic nematodes. It covers detailed morphological structures and anatomical systems in the context of their physiological and ecological functions as well as systematics, classification, and identification.

COURSE GOALS AND/OR OBJECTIVES: By the end of this course, students will BE ABLE TO:

1. Identify, describe, and recognize a variety of morphological and anatomical features used in nematode classification.
2. Analyze and interpret the features of nematodes in the context of evolutionary relationships.
3. Predict the role of features of nematodes in physiology, behavior, and ecology.
4. Analyze and critique scientific publications relevant to nematode morphology and anatomy.

REQUIRED TEXT: The structure of Nematodes. Bird, A. F. and J. Bird. 1991. Second edition. Academic Press. The e-version of this book is available for purchase [here](#).

REQUIRED PAPER READINGS: (see schedule for dates):

- Avery, L. and You, Y.J., 2012. *C. elegans* feeding. *WormBook: the online review of C. elegans biology*, pp.1-23.
- Baldwin, J.G., Nadler, S.A. and Adams, B.J., 2004. Evolution of plant parasitism among nematodes. *Annu. Rev. Phytopathol.*, 42, pp.83-105.
- De Ley, P., 2006. A quick tour of nematode diversity and the backbone of nematode phylogeny. In *WormBook: The Online Review of C. elegans Biology [Internet]*. WormBook.
- Denver, D.R., Clark, K.A. and Raboin, M.J., 2011. Reproductive mode evolution in nematodes: insights from molecular phylogenies and recently discovered species. *Molecular phylogenetics and evolution*, 61(2), pp.584-592.
- Dirksen, P., Marsh, S.A., Braker, I., Heitland, N., Wagner, S., Nakad, R., Mader, S., Petersen, C., Kowallik, V., Rosenstiel, P. and Félix, M.A., 2016. The native microbiome of the nematode *Caenorhabditis elegans*: gateway to a new host-microbiome model. *BMC biology*, 14(1), p.38.
- Lažetić, V. and Fay, D.S., 2017, January. Molting in *C. elegans*. In *Worm* (Vol. 6, No. 1, p. e1330246). Taylor & Francis.
- Kiontke, K. and Fitch, D.H., 2010. Phenotypic plasticity: different teeth for different feasts. *Current Biology*, 20(17), pp.R710-R712.
- Nadler, S.A., De Ley, P., Mundo-Ocampo, M., Smythe, A.B., Stock, S.P., Bumbarger, D., Adams, B.J., De Ley, I.T., Holovachov, O. and Baldwin, J.G., 2006. Phylogeny of Cephalobina (Nematoda): molecular evidence for recurrent evolution of probolae and incongruence with traditional classifications. *Molecular Phylogenetics and Evolution*, 40(3), pp.696-711.
- Schafer, W., 2016. Nematode nervous systems. *Current Biology*, 26(20), pp. R955-R959.

ADDITIONAL RESOURCES: Introduction to Nematology. Chitwood and Chitwood. 1974; The Biology of Nematodes, Lee, D. 2002; Structure and classification. 2013. Decraemer W and Hunt D. In: Plant Nematology, 2nd edn. Eds: Perry R and Moens M.

PREREQUISITE KNOWLEDGE AND SKILLS: Your curiosity, excitement about learning, and appreciation for nematode diversity!

INSTRUCTIONAL METHODS: This course will be conducted entirely online through Canvas. It will consist of viewing pre-recorded lectures (1-2 hrs/week), readings (2-3 hrs/week), online discussions (1 hr/week), assignments (30 min – 1 hr/week), and quizzes (30 min/week). You are expected to watch lectures and complete readings prior to weekly engagement in activities (e.g., discussions) that will help you to master the content. Additionally, all students will be assigned to submit a written report (1 – 2 hrs/week).

GRADING POLICIES:

Assignment	Total Points	% of Final Grade
Midterm Exam	100	20%
Final Exam	110	20%
Virtual Practical Exam	120	20%
Written Report	100	10%
12 Quizzes	300	10%
9 Reading Assignments	230	10%
9 Discussions	90	10%

EXAMS

Exams will be limited to 2 hours, and virtually proctored using [Honorlock](#). Midterm will cover 1.1 – 3.2 modules, Final Exam 3.3 – 6.1 modules, and Virtual Practical Exam will involve recognition of morphological features from relevant images used in the course.

WRITTEN REPORT

The report will be on an approved topic of student’s choice relevant to the topic of the morphology and anatomy of nematodes. The report will be summarized in a format of a scientific paper. Grading rubrics will be provided ahead of time.

QUIZZES

Each module will become available at 9 am on Wednesdays. Each module will have a narrated lecture that will be summarized in a form of a quiz (a total of 12 quizzes). Quizzes will be open for one week with a submission deadline right prior to opening of a new module (by Wednesday 9 am). Quiz questions will include different formats including multiple choice, matching, fill in the blanks, and short answers. They will be open book, limited to 30 minutes, and not proctored.

ASSIGNMENTS and DISCUSSIONS

All assignments will involve: 1. Reading an article (a total of 9 articles) and answering assigned questions, and 2. Participating in a board discussion (a total of 9 discussions). Grading rubrics for discussions will be provided. Again, articles will become available with opening of every module (9 am on Wednesdays). Submission of answers to assigned questions and participation in discussions will be due prior to the opening of a new module (by Wednesday at 9 am).

GRADING SCALE (%):

100 – 94	A
<94 – 90	A-
<90 – 87	B+
<87 – 84	B
<84 – 80	B-
<80 – 77	C+
<77 – 74	C
<74 – 70	C-
<70 – 67	D+
<67 – 64	D
<64 – 60	D-
<60	E

COURSE SCHEDULE:

FINAL EXAM: December 16, 2022

Module Schedule with topics and assigned article titles.

Module	Week	Topic	Reading Assignment
1.1	08/24/22	Introduction, phylogeny, history	De Ley 2006
2.1	08/31/22	General morphology, cuticle markings and structures	Nadler et al. 2006
2.2	09/07/22	Cuticle anatomy and function	Lazetić and Fay 2017
2.3	09/14/22	Hypodermis and musculature	NA

3.1	09/21/22	Introduction to digestive system Written Report Topic Due	Yeates et al. 1993
3.2	09/28/22	Stoma	Kiontke and Fitch 2010
3.2	10/05/22	Stoma Written Report Outline Due	Baldwin et al. 2004
	10/12/20	Review	NA
	10/19/22	MIDTERM EXAM	NA
3.3	10/19/22	Esophagus Written Report 1st Draft Due	Avery and You 2013
3.4	10/26/22	Intestine and posterior gut	Dirksen et al. 2016
4.1	11/02/22	Secretory/excretory system	
5.1	11/09/22	Nervous system Written Report 2nd Draft Due	Schafer 2016
6.1	11/16/22	Reproductive system	Denver et al. 2011
	11/30/22	Review	NA
	12/07/22	VIRTUAL PRACTICAL EXAM Written Reports Final Due	
	12/14/22	FINAL EXAM	

Disclaimer: This syllabus represents my current plans and objectives. As we go through the semester, those plans may need to change to enhance the class learning opportunity. Such changes, communicated clearly, are not unusual and should be expected.

COURSE POLICIES:

EXAM POLICY: Quizzes/exams for the lecture component will be posted online along with specific completion time deadlines.

ASSIGNMENT POLICY: All assignments submitted on time have a potential to receive full credit, 1-day late to receive 80% of the full credit, 2-days late to receive 60% of the full credit, and assignments that are more than 2 days late receive 0. All assignments have a rubric to guide you through the assignment.

COURSE DELIVERY: All lecture modules, required/extra readings, quizzes and exams will be available on CANVAS.

GRADES AND GRADE POINTS: For information on current UF policies for assigning grade points, see <https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>.

ATTENDANCE AND MAKE-UP WORK: Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at: <https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>.

ONLINE COURSE EVALUATION PROCESS: Student assessment of instruction is an important part of efforts to improve teaching and learning. At the end of the semester, students are expected to provide feedback on the quality of instruction in this course using a standard set of university and college criteria. Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at: <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at: <https://gatorevals.aa.ufl.edu/public-results/>.

ACADEMIC HONESTY: As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: *"we, the members of the university of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity."* You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied: *"on my honor, I have neither given nor received unauthorized aid in doing this assignment."*

It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: <http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code>.

SOFTWARE USE: All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

SERVICES FOR STUDENTS WITH DISABILITIES: The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation

0001 Reid Hall, 352-392-8565, <https://disability.ufl.edu/>

CAMPUS HELPING RESOURCES: Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

- *University Counseling & Wellness Center, 3190 Radio Road, 352-392-1575, www.counseling.ufl.edu*
 - Counseling Services
 - Groups and Workshops
 - Outreach and Consultation
 - Self-Help Library
 - Wellness Coaching
- U Matter We Care, www.umatter.ufl.edu/
- *Career Connections Center, First Floor JWRU, 32-392-1601, <https://career.ufl.edu/>*

Student Complaints:

- Residential Course: <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>
- Online Course: <http://www.distance.ufl.edu/student-complaint-process>