

NEMATODE SYSTEMATICS AND MOLECULAR PHYLOGENY
(NEM 6102)

Instructor: Dr. Tesfamariam Mekete Mengistu (Tesfa), email: tmekete@ufl.edu,
Tel: 352-273-3936,
Office: Room 2210, Entomology and Nematology Building

Credit Hours: 2 credits

Prerequisite or/and co-requisite-: NEM 6942C (Nematode Diagnosis)

Meeting Place: Charles Steinmetz Building, Entomology and Nematology.

Meeting Time: Lecture M 3-5

Office hours: I have very unpredictable lab work duties, so I do not set formal office hours. If you need to meet with me, please set up a meeting during or after class, or send me an email at tmekete@ufl.edu, and I will be glad to schedule a meeting. If you need to reach me other than by e-mail, my office phone is 352-273-3936.

Course Description: **NEM 6102** is a 2-credit course that will focus on theory and practice of using molecular evidence, particularly DNA sequence data, for addressing diverse systematic and evolutionary questions. The class will cover morphological, molecular, and basic bioinformatics tools used in nematology.

Learning objectives: upon completion of this course, student will be able to:

- Possess theoretical background in nematode taxonomy and systematics
- Appreciate the importance of nematode systematics
- Recognize the value of nematode systematics
- Understand the importance of bioinformatics in nematology

Textbook:

Required: None

Suggested:

1. The Biology of Nematodes, Donald Lee, 2002;
2. Dorylaimida: free-living, predaceous and plant-parasitic nematodes. Jairajpuri and Ahmad, 1992;
3. A taxonomic review of the suborder Rhabditida. Andrassy, 1983

These and many other books are available in my research laboratory for use by students

Students are responsible for reading relevant materials and articles. Each week, students will have assigned readings, usually from current literature. Examples of the articles we will discuss in class are:

- Adams, B.J. (1998). Species concepts and the evolutionary paradigm in modern nematology. *J. Nematol.*, 30:1-21
- Blaxter M, Floyd R. (2003). Molecular taxonomics for biodiversity surveys: already a reality. *Trends Ecol. Evol.* 18: 268-269.
- Blaxter M. (2003). Molecular systematics: counting angels with DNA. *Nature* 421: 122-124.
- Blaxter M. (2004). The promise of DNA taxonomy. *Philos. Trans. R. Soc.B* 359: 669-679.
- Eyualem A, Baldwin J, Adams B, Hope D, Gardner S, Huettel R, Mullin P, Powers T, Sharma J, Ye W, Thomas W. (2006). A position paper on the electronic publication of nematode taxonomic manuscripts. *J. Nematol.* 38: 305-311.

- Fonseca G, Derycke S, Moens T. (2008). Integrative taxonomy in two free-living nematode species complexes. *Biol. J. Linn. Soc.* 94: 737- 753.
- Hajibabaei M, Singer G, Hebert P, Hickey D. (2007). DNA barcoding: how it complements taxonomy, molecular phylogenetics and population genetics. *Trends Genet.* 23: 167-172.
- Hey J. (2006). On the failure of modern species concepts. *Curr. Trends Ecol. Evol.* 21: 447-450.

Policy on class attendance and classroom demeanor:

Class attendance is mandatory. Unexcused absences that exceed 3 classes during the semester will lower your class grade by 2 percentage points for each absence. Excused absences after #3 that are related to officially recognized UF activities or accompanied by a doctor's note are not penalized. However, for each absence exceeding your 3rd, in order to prevent the loss of the 2 percentage points, a 5-page paper will be assigned that will include at least 10 citations. Failure to submit or submission of a poor quality paper will lower your class grade by 2 percentage points. Additional details will be provided in these instances. Students are afforded 3 opportunities to recover deducted points.

Grading

The information on UF's grading policies can be found at:

<http://www.registrar.ufl.edu/catalog/policies/regulationgrades.html>

Grading scale (%) and points needed to achieve a grade for this course is as follows:

Grade	Percentage	Points
A	90 - 100	450 - 500
B+	88 - 89	449 - 450
B	80 - 87	400 - 448
C+	78 - 79	390 - 399
C	70 - 77	350 - 389
D	60 - 69	300 - 349
E	<60	0 - 299

Evaluation: The requirements for this course are listed below:

<u>NEM 6102C</u>	<u>Point Value</u>	<u>Total</u>
Laboratory book evaluation (10)	10 each	100
Laboratory project (2)	100 each	200
Homework (10)	5 each	50
1 st Practical exam	50	50
2 nd Practical exam	100	100
<hr/>		
Total		500

Your grade for this course will be based on a possible 500 points and determined by the percentage breakdown presented above. All exams will cover materials covered during lectures and will include short answer and essay questions.

There will be five quizzes with questions based on material in previous lectures. Quizzes will be 5-10 minutes in length. These quizzes are designed to help you keep you up to date in the class, and to encourage you to do practice questions.

Each student will give a 15-minute presentation highlighting a key article about the topics covered during class and write a 5 page summarized report. Topics and research articles will be allocated in the first lecture. Extra credit may be allocated to students who ask questions and participate regularly in discussions.

Policy on make-up exams and other work:

A student is permitted to make up a missed exam without penalty if he/she has a conflict between an exam/quiz and a scheduled University-approved activity or if he/she has more than one exam/quiz scheduled at the same time, provided advanced notification is given to the instructor. Students not notifying the instructor and making such arrangements in advance will not be permitted to take the exam and will receive a zero.

Lecture Schedule

Lecture 1	Introduction
Lecture 2	General Taxonomy and Systematics
Lecture 3	How to write a taxonomic paper; Higher level nematode taxonomy and systematics (nomenclature)
Lecture 4	Order Rhabditida, Morphology; Order Triplonchida, Morphology
Lecture 5	Order Rhabditida, Morphology; Order Triplonchida, Morphology
Lecture 6	Order Dorylaimida, Morphology; Order Mononchida, Morphology
Lecture 7	Order Dorylaimida, Morphology; Order Mononchida, Morphology
Lecture 8	Identification guides for the most common genera of plant parasitic nematodes
Lecture 9	Central dogma of molecular biology; DNA in a cell
Lecture 10	Central dogma of molecular biology; DNA in a cell
Lecture 11	Midterm Exam
Lecture 12	PCR and Sequencing principles
Lecture 13	PCR and Sequencing principles
Lecture 14	Structure of Genes and genomes; Species concepts and delimiting species in nematology
Lecture 15	Structure of Genes and genomes; Species concepts and delimiting species in nematology
Lecture 16	Nematodes as a model organism; Phylogeny and classification
Lecture 17	Nematodes as a model organism; Phylogeny and classification
Lecture 18	Bioinformatics
Lecture 19	Bioinformatics
Lecture 20	Project Presentation I
Lecture 21	Project Presentation II
Lecture 22	Final Exam

Grades and Grade Points

For information on current UF policies for assigning grade points, see <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

Academic Honesty, Software Use, Campus Helping Resources, Services for Students with Disabilities

Academic Honesty

In 1995 the UF student body enacted an [honor code](#) and voluntarily committed itself to the highest standards of honesty and integrity. When students enroll at the university, they commit themselves to the standard drafted and enacted by students.

The Honor 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.

On all work submitted for credit by students at the university, the following pledge is either required or implied: **"On my honor, I have neither given nor received unauthorized aid in doing this assignment."**

Students should report any condition that facilitates dishonesty to the instructor, department chair, college dean, Student Honor Council, or Student Conduct and Conflict Resolution in the Dean of Students Office.

(Source: 2012-2013 Undergraduate Catalog)

It is assumed all work will be completed independently unless the assignment is defined as a group project, in writing by the instructor.

This policy will be vigorously upheld at all times in this course.

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.

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/cwc/*
 - Counseling Services
 - Groups and Workshops
 - Outreach and Consultation
 - Self-Help Library
 - Training Programs
 - Community Provider Database
- *Career Resource Center, First Floor JWRU, 392-1601, www.crc.ufl.edu/*

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.

0001 Reid Hall, 352-392-8565, www.dso.ufl.edu/drc/