BIOLOGICAL CONTROL

ENY 5241

SPRING 2024

Instructor: Dr. Nicole F. Quinn

Indian River REC

772-577-7377

nicole.quinn@ufl.edu Room

Credits: 4

Interactive discussion sessions via Zoom:

Mondays 8:30-10:20am Eastern

Description and Objectives. This course examines the fundamental concepts of applied biological control of insects and mites. Overviews of the diversity and biology of entomopathogenic nematodes, viruses, bacteria, and fungi, predators, and parasitoids are presented. Current philosophies, strategies, and tactics of classical, augmentation, and conservation biological control are discussed. Specific cases of applied biological control are studied. Methods for monitoring and evaluating natural enemies are studied, and Federal laws, and public education are addressed. Narrated slide presentations and readings provide information for weekly interactive discussions. An oral presentation on a topic directly related to biological control and a Featured Creature article are prepared and delivered by each student.

In this course, the student will learn:
1. Definitions of biological control.
2. History of biological control.
3. Diversity and biology of the natural enemies of insects and mites.
4. Applied biological control strategies: classical, augmentation, and conservation.
5. Natural enemy monitoring and evaluation.
6. Federal laws affecting biological control.
7. Grower and homeowner education in biological control.

The **NARRATED POWERPOINT LECTURES**, with 1-3 parts, present content on selected topics. The lectures are grouped into 11 modules. All lectures are available on the course's e-Learning site. These lectures should be viewed prior to the module's discussion session so that the student can answer questions posited during the session.

The **DISCUSSION SESSIONS** (via Zoom) are held every Monday morning (unless otherwise indicated) starting at 8:30AM Eastern. During these sessions, students will have an opportunity to ask questions, request clarification on specific topics in the lectures, and share experiences and opinions.

COURSE SCHEDULE

January 10: FIRST DAY OF CLASS

- Participant introductions, course overview, syllabus, and student expectations and knowledge of biological control.

January 11-24: MODULE 1

- Assignment #1 due January 12.
- View Lecture 1 (Introduction to biological control) and Lecture 2 (Desirable characteristics of a good biological control agent).
- Read van Driesche and Bellows (1996).
- Discussion of Lectures 1 and 2 and assigned reading - January 24.

January 25-31: MODULE 2

- Module 1 synopsis due January 26.
- View Lecture 3 (Biology, diversity, and application of entomopathogenic nematodes).
- Read van Dolinski *et al*. (2012).
- Discussion of Lecture 3 and assigned reading with Dr. Duncan – January 31.

February 1-7: MODULE 3

- Module 2 synopsis due February 2.
- View Lecture 4 (Entomopathogenic viruses), Lecture 5 (Entomopathogenic bacteria), and Lecture 6 (Entomopathogenic fungi).
- Read Bamisile *et al*. (2019).
- Do Assignment #2: due February 7.
- Discussion of Lectures 4-6 and assigned reading with Dr. Avery – February 7.

February 8-14: MODULE 4

- Module 3 synopsis due February 9.
- EXAM I (Lectures 1-6): February 9.
- View Lecture 7 (Diversity and biology of predators).
- Read Otto *et al*. (2008).
- Final day for approval of Featured Creature topic: February 11.
- Discussion of Lecture 7 and assigned reading – February 14.

February 15-21: MODULE 5

- Module 4 synopsis due February 16.
- View Lecture 8 (Diversity and biology of parasitoids).
- Read Boivin *et al*. (2012).
- Final day for approval of oral presentation topic: February 18.
- Discussion of Lecture 8 and assigned reading – February 21.

February 22-28: MODULE 6

- Module 5 synopsis due February 23.
- View Lecture 9 (Augmentation biological control).
- Read van Lenteren (2012).
- Do Assignment #3: due February 28.
- Discussion of Lecture 9 and assigned reading - February 28.

March 1-14: MODULE 7 - Note that SPRING BREAK occurs March 5-12

- Module 6 synopsis due March 2.
- View Lecture 10 (Conservation biological control).
- Read Perdikis *et al*. 2011.
- Discussion of Lecture 10 and assigned reading – March 14.

March 15-21: MODULE 8

- Module 7 synopsis due March 16.
- EXAM II (Lectures 7-10): March 16.
- View Lecture 11 (Concepts of classical biological control) and Lecture 12 (Classical biological control of insects).
- Read Frank and McCoy 2007.
- Discussion of Lectures 11-12 and assigned reading - March 21.

March 22-28: MODULE 9

- Module 8 synopsis due March 23.
- View Lecture 13 (Concepts of classical biological control of weeds), Lecture 14 (Classical biological control of terrestrial weeds), and Lecture 15 (Classical biological control of aquatic weeds).
- Read Lake *et al*. 2015.
- Discussion of Lectures 13-15 and assigned reading with Dr. Minteer: March 28.

March 29-April 4: MODULE 10

- Module 9 synopsis due March 30.
- View Lecture 16 (Natural enemy monitoring and evaluation).
- First draft of Featured Creature article due April 4.
- Discussion of Lecture 16 – April 4.

April 5-11: MODULE 11

- Module 10 synopsis due April 6.
- View Lecture 17 (Federal laws affecting biological control) and Lecture 18 (Grower and homeowner education in biological control).
- Discussion of Lectures 17-18 and with Dr. Eric Rohrig (FDACS DPI) – April 11.

April 12-20:

- Module 11 synopsis due April 13.
- EXAM III (Lectures 12-18): April 13.

- Oral presentation abstracts due April 15.
- Student presentations – April 18.
- Final Featured Creature article due April 20.

STUDENT PERFORMANCE ASSESSMENTS

Three **EXAMS** are taken on-line. Students may use notes, books, and the Internet as resources during the exam. Because the exams are time-limited, students should prepare themselves for the exam beforehand rather than depend on finding information during the exam. Each exam has two parts that are taken separately. Part 1 has 35 multiple choice questions. Part 2 has 12 fill-in questions and 7 essay questions. For essay questions, all responses must be in your own words, not copied and pasted from the reading or lectures. Precision, accuracy, and completeness in your short answers are critical. Part 1 can be taken first, or Part 2 can be taken first, but both parts must be completed before the deadline. Each exam is worth 150 points. The exam schedule is as follows:

*Exam I: February 9 7:00am – 11:30pm
**Exam II: March 16 7:00am – 11:30pm
***Exam III: April 13 7:00am – 11:30pm

SYNOPSES are syntheses of the information presented in each module's lectures and assigned reading. Write a well-written, coherent overview (not an outline) of the learning objectives of each lecture and the reading assignment in the module to indicate you have thoroughly studied the material and comprehend it. The synopsis must not exceed one page with text single-spaced and 1" margins on all sides. Include your name on each synopsis. Each module's synopsis should be delivered through the course's e-Learning site and is due two days after Monday session during which that module's material is discussed (see Course Schedule for delivery dates of synopses). Each synopsis is worth 20 points (see rubric). You may miss three synopses without penalty. A synopsis delivered after the due date will be penalized 2 points for each calendar day it is late. **Proper grammar, correct spelling, and clear writing are considered in scoring the synopses.**

Three **ASSIGNMENTS** are worth 30 points apiece. An assignment delivered after the due date will be penalized 2 points for each calendar day it is late.

ASSIGNMENT #1: Autobiography

- Click "Reply" and paste or write a statement telling everyone in the class about you. Give your name, hometown, and degree program.
- If you are doing thesis or dissertation research, describe it.
- State why you are enrolled in the course.
- Describe any previous experience with applied biological control.
- Describe your career goals and how applied biological control might fit in.

ASSIGNMENT #1 IS DUE JANUARY 12, 2022.

ASSIGNMENT #2: Comparative analysis of four commercially available biological controls

For each of the four biological controls listed below, locate three companies on-line that sell them (the three companies need not be the same for all four natural enemies). For each natural enemy, compare the products among the three companies. Provide the name of each company mentioned and its website address. **COMPARE** pricing, quantities available, packaging (*e.g*., stage shipped), and availability of supporting information (*e.g*., release recommendation, target pests, biology, regulatory status, anything else). Do not repeat verbatim the vendor's supporting information (all the details are unnecessary, *e.g*., no need to list all the pests it controls); boil it down to one or two general statements. Also, mention from which company you would purchase and explain your choice. The information may be presented in chart or table form. Suggested categories:

- *Trichogramma* sp.: There are several species, but all attack insect eggs; select ONE species and compare it across the three companies. Be sure to provide the name of the species.
- *Chrysopa*/*Chrysoperla* sp. (predators commonly called aphid lions and green lacewings): There are several species; select ONE species and compare it across the three companies. Give the name of the species.
- Any species of predatory lady beetle (Coccinellidae): There are several species; select ONE species and compare it across the three companies. Give the name of the species.
- Any species of predatory mite: There are several species, but all attack insect eggs; select ONE species and compare it across the three companies. Give the name of the species.
- Fungus-based biopesticide: There are several fungus species sold for arthropod pest management; select and compare three products that contain the same fungus species.
- Bacterium-based biopesticide: There are several bacteria species sold arthropod pest management; select and compare three products that contain the same bacterium species.
- Nematode-based biopesticide: There are several nematode species sold for arthropod pest management; select and compare three products that contain the same nematode species.
- Virus-based biopesticide: There are several viruses sold for arthropod pest management; select and compare three products that contain the same virus.
- Natural enemy of your choice: please be prepared to justify your choice. The assignment must be similar in format to the ones described above.

The information provided may be presented in chart form. Place your name on the document that you deliver through the course's eLearning site.

ASSIGNMENT #2 IS DUE February 28, 2022.

ASSIGNMENT #3 TBD

The **STUDENT PRESENTATION**, also an individual effort, is a synthesis of information from literature and/or experience on a topic directly related to any aspect of biological control of insects and mites. The topic of the paper MUST be approved by the instructor (RDC) no later than **February 18, 2022.** No two presentations on the same topic may be done, so decide on a topic and have it approved by the instructor soon.
A well-written abstract of 300-500 words should be delivered through the course's e- Learning site by **April 15, 2022.** A late abstract will be penalized 2 points for each calendar day it is late. Following the abstract, you must provide the complete citations of at least 3 and no more than 5 journal articles and/or books as sources for additional information; up to 4 websites may optionally be listed IN ADDITION to the 3-5 articles/books. Do not cite them in the text of the abstract. Be consistent in formatting references. Use of information gathered from Wikipedia is not allowed. Citation of Wikipedia will automatically result in a 0 on the project paper.
Grammar, neatness, formatting, and spelling will be considered in the final evaluation of your abstract.
The presentation should be 18-20 minutes [this may change depending on enrollment in the course] in duration and will be delivered on **April 18, 2022**. The PowerPoint slides to be shown for your oral presentation must be sent to the instructor no less than 24 hours before your oral presentation. 7

It is highly recommended that the instructor review your draft abstract and slides before final submission.
The presentation will be scored as follows:

- Approval of topic by February 14, 2020 – 10 points
- Quality and organization of slides – 40 points
- Quality of oral delivery – 40 points
- Meaningful, thorough, and well-organized content on subject matter – 80 points
- Abstract – 30 points

STUDENT ASSESSMENT:
Three exams (150 points each) 450 pts
Eight module synopses (20 points each) 160 pts
Three assignments (30 pts each) 90 pts
_____ 100 pts
Presentation 200 pts
TOTAL 1,000 pts
COURSE GRADING SCALE:
A = 100-93% B+ = 89.9-87% C+ = 79.9-77% D+ = 69.9-67%
A- = 92.9-90% B = 86.9-83% C = 76.9-73% D = 66.9-63% B- = 82.9-80% C- = 72.9-70% D- = 62.9-60%
E = 59.9-0%
Information on current UF grading policies for assigning grade points is at:
catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx.
UNIVERSITY OF FLORIDA POLICIES AND ASSISTANCE
Absences 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: catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx.

Online Course Evaluation Process

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at evaluations.ufl.edu. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at: evaluations.ufl.edu/results/.

Academic Honesty

As a student at the University of Florida, you committ 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 8

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: www.dso.ufl.edu/SCCR/honorcodes/honorcode.php.

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, 352-392-1575, **www.counseling.ufl.edu/cwc/**

Counseling Services Self-Help Library

Groups and Workshops Training Programs

Outreach and Consultation Community Provider Database

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 with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, **disability.ufl.edu**) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Distance Courses
Each online distance learning program has a process for, and will make every attempt to resolve, student complaints within its academic and administrative departments at the program level. See www.distance.ufl.edu/student-complaint-process.

February 22-28: MODULE 6

Module 5 synopsis due February 23.

View Lecture 9 (Augmentation biological control).

Read van Lenteren (2012).

Do Assignment #3: due February 28.

Discussion of Lecture 9 and assigned reading - February 28.

March 1-14: MODULE 7 - Note that SPRING BREAK occurs March 5-12

Module 6 synopsis due March 2.

View Lecture 10 (Conservation biological control).

Read Perdikis *et al*. 2011.

Discussion of Lecture 10 and assigned reading – March 14.

March 15-21: MODULE 8

Module 7 synopsis due March 16.

EXAM II (Lectures 7-10): March 16.

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Read Frank and McCoy 2007.

Discussion of Lectures 11-12 and assigned reading - March 21.

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Three **ASSIGNMENTS** are worth 30 points apiece. An assignment delivered after the due date will be penalized 2 points for each calendar day it is late.
ASSIGNMENT #1: Autobiography
- Click "Reply" and paste or write a statement telling everyone in the class about you. Give your name, hometown, and degree program.
- If you are doing thesis or dissertation research, describe it.
- State why you are enrolled in the course.
- Describe any previous experience with applied biological control.
- Describe your career goals and how applied biological control might fit in.

ASSIGNMENT #1 IS DUE JANUARY 12, 2022. 5

ASSIGNMENT #2: Comparative analysis of four entomopathogen products

For each of the four types of biopesticides listed below, locate three companies on-line that sell them (the three companies need not be the same for all four biopesticides). For each biopesticide, compare the products among the three companies. The three products compared within each of the four groups must be based on the same species of organism. State the name of each company mentioned and its website address. The information provided may be presented in chart form. Provide the name of the product sold by each company and the organism species on which the product is based. **COMPARE** pricing, quantities available, and availability of supporting information (*e.g*., application recommendation, target pests, website quality, anything else). Do not repeat verbatim the vendor's supporting information; boil it down to one or two general statements. Also, mention which biopesticide product from which company you would purchase to control a specific pest and explain your choice. The four biopesticide groups are:

* Fungus-based biopesticide: There are several fungus species sold for arthropod pest management; select and compare three products that contain the same fungus species.

* Bacterium-based biopesticide: There are several bacteria species sold arthropod pest management; select and compare three products that contain the same bacterium species.

* Nematode-based biopesticide: There are several nematode species sold for arthropod pest management; select and compare three products that contain the same nematode species.

* Virus-based biopesticide: There are several viruses sold for arthropod pest management; select and compare three products that contain the same virus.

Place your name on the document that you deliver through the course's eLearning site.

ASSIGNMENT #2 IS DUE February 7, 2022.

ASSIGNMENT #3: Comparative analysis of four commercially available arthropod natural enemies

For each of the four natural enemies listed below, locate three companies on-line that sell them (the three companies need not be the same for all four natural enemies). For each natural enemy, compare the products among the three companies. Provide the name of each company mentioned and its website address. **COMPARE** pricing, quantities available, packaging (*e.g*., stage shipped), and availability of supporting information (*e.g*., release recommendation, target pests, biology, anything else). Do not repeat verbatim the vendor's supporting information (all the details are unnecessary, *e.g*., no need to list all the pests it controls); boil it down to one or two general statements. Also, mention from which company you would purchase the natural enemy and explain your choice. The four natural enemies are:

* *Trichogramma* sp.: There are several species, but all attack insect eggs; select ONE species and compare it across the three companies. Be sure to provide the name of the species.

* *Chrysopa*/*Chrysoperla* sp. (predators commonly called aphid lions and green lacewings): There are several species; select ONE species and compare it across the three companies. Give the name of the species.

* Any species of predatory lady beetle (Coccinellidae): There are several species; select ONE species and compare it across the three companies. Give the name of the species.

* Any species of predatory mite: There are several species, but all attack insect eggs; select ONE species and compare it across the three companies. Give the name of the species.

The information provided may be presented in chart form. Place your name on the document that you deliver through the course's eLearning site.
ASSIGNMENT #3 IS DUE February 28, 2022. 6

FEATURED CREATURE ARTICLE: Each student is required to develop a "Featured Creatures" (FC) fact sheet on an arthropod predator or parasitoid that is NOT CURRENTLY in or planned for FC (http://entnemdept.ufl.edu/creatures/). Use the "Assignments" feature of the course's e-Learning site to upload documents. All deadlines are midnight of the day that they are due. Late submissions will be docked 2 points on the individual component grade for each 24 hours after **each** deadline.

Visit http://entomology.ifas.ufl.edu/creatures/FC_format.pdf for the FC-specific guidelines for article preparation. The content should include the taxonomy of the natural enemy, identification, biology, hosts/prey, images, and references.

The Featured Creatures article grade will be determined through a multi-step evaluation process that includes topic approval, submission of a first draft, an evaluative review, revision, and submission of a final draft. Please be sure to read the following to ensure that you are meeting the deadlines. Failure to adhere to the schedule and process will result in lost points.

1. Students must contact the instructor (RDC) to receive topic approval before proceeding. The topic must be chosen and approved by **February 11, 2022**. (10 pts)
2. To be eligible for full credit, the first draft must be submitted to the instructor in electronic form by **April 4, 2020**. The draft is expected to be essentially complete with significant material provided in each category. The instructor will review the draft for effort, form, overall progress, proper grammar, correct spelling, and clear writing. (30 pts)
3. The final version of the Featured Creature article is due **April 20, 2022**. The assignment will be evaluated on the completeness of the overall document, thoroughness of the subject matter, incorporation of appropriate illustrations and images (which may come from the Web), and the incorporation of suggested revisions (not all suggestions must be incorporated, but you must justify when comments are not incorporated), proper grammar, correct spelling, and clear writing. (60 pts)

The **STUDENT PRESENTATION**, also an individual effort, is a synthesis of information from literature and/or experience on a topic directly related to any aspect of biological control of insects and mites. The topic of the paper MUST be approved by the instructor (RDC) no later than **February 18, 2022.** No two presentations on the same topic may be done, so decide on a topic and have it approved by the instructor soon.

A well-written abstract of 300-500 words should be delivered through the course's e- Learning site by **April 15, 2022.** A late abstract will be penalized 2 points for each calendar day it is late. Following the abstract, you must provide the complete citations of at least 3 and no more than 5 journal articles and/or books as sources for additional information; up to 4 websites may optionally be listed IN ADDITION to the 3-5 articles/books. Do not cite them in the text of the abstract. Be consistent in formatting references. Use of information gathered from Wikipedia is not allowed. Citation of Wikipedia will automatically result in a 0 on the project paper. **Grammar, neatness, formatting, and spelling will be considered in the final evaluation of your abstract.**

The presentation should be 18-20 minutes [this may change depending on enrollment in the course] in duration and will be delivered on **April 18, 2022**. The PowerPoint slides to be shown for your oral presentation must be sent to the instructor no less than 24 hours before your oral presentation. 7

It is highly recommended that the instructor review your draft abstract and slides before final submission.
The presentation will be scored as follows:

- • Approval of topic by February 14, 2020 – 10 points
- • Quality and organization of slides – 40 points
- • Quality of oral delivery – 40 points
- • Meaningful, thorough, and well-organized content on subject matter – 80 points
- • Abstract – 30 points

STUDENT ASSESSMENT:
Three exams (150 points each) 450 pts
Eight module synopses (20 points each) 160 pts
Three assignments (30 pts each) 90 pts
Featured Creature article 100 pts
Presentation 200 pts
TOTAL 1,000 pts
COURSE GRADING SCALE:
A = 100-93% B+ = 89.9-87% C+ = 79.9-77% D+ = 69.9-67%
A- = 92.9-90% B = 86.9-83% C = 76.9-73% D = 66.9-63% B- = 82.9-80% C- = 72.9-70% D- = 62.9-60%
E = 59.9-0%
Information on current UF grading policies for assigning grade points is at:
catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx.
UNIVERSITY OF FLORIDA POLICIES AND ASSISTANCE
Absences 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:
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Online Course Evaluation Process
Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at evaluations.ufl.edu. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at:
evaluations.ufl.edu/results/.
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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: www.dso.ufl.edu/SCCR/honorcodes/honorcode.php.

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University Counseling & Wellness Center, 352-392-1575, **www.counseling.ufl.edu/cwc/**
Counseling Services Self-Help Library
Groups and Workshops Training Programs
Outreach and Consultation Community Provider Database

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 with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, **disability.ufl.edu**) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Distance Courses

Each online distance learning program has a process for, and will make every attempt to resolve, student complaints within its academic and administrative departments at the program level. See www.distance.ufl.edu/student-complaint-process. **February 22-28: MODULE 6**
Module 5 synopsis due February 23.

View Lecture 9 (Augmentation biological control).

Read van Lenteren (2012).

Do Assignment #3: due February 28.

Discussion of Lecture 9 and assigned reading - February 28.

March 1-14: MODULE 7 - Note that SPRING BREAK occurs March 5-12

Module 6 synopsis due March 2.

View Lecture 10 (Conservation biological control).

Read Perdikis *et al*. 2011.

Discussion of Lecture 10 and assigned reading – March 14.

March 15-21: MODULE 8

Module 7 synopsis due March 16.

EXAM II (Lectures 7-10): March 16.

View Lecture 11 (Concepts of classical biological control) and Lecture 12 (Classical biological control of insects).

Read Frank and McCoy 2007.

Discussion of Lectures 11-12 and assigned reading - March 21.

March 22-28: MODULE 9

Module 8 synopsis due March 23.

View Lecture 13 (Concepts of classical biological control of weeds), Lecture 14 (Classical biological control of terrestrial weeds), and Lecture 15 (Classical biological control of aquatic weeds).

Read Lake *et al*. 2015.

Discussion of Lectures 13-15 and assigned reading with Dr. Minteer: March 28.

March 29-April 4: MODULE 10

Module 9 synopsis due March 30.

View Lecture 16 (Natural enemy monitoring and evaluation).

First draft of Featured Creature article due April 4.

Discussion of Lecture 16 – April 4.

April 5-11: MODULE 11

Module 10 synopsis due April 6.

View Lecture 17 (Federal laws affecting biological control) and Lecture 18 (Grower and homeowner education in biological control).

Discussion of Lectures 17-18 and with Dr. Eric Rohrig (FDACS DPI) – April 11.