COURSE DATA

DATA SUBJECT

Code: 43241
Name: Nematology
Cycle: Master's Degree
ECTS Credits: 3
Academic year: 2025-26

STUDY (S)

Degree	Center	Acad. year	Period
2148 - Master's degree in Biodiversity: Conservation and Evolution	Facultat de Ciències Biològiques	1	Second quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
2148 - Master's degree in Biodiversity: Conservation and Evolution	Biodiversity and conservation of invertebrates	ELECTIVES

COORDINATION

PEREZ DEL OLMO ANA

REPULLES ALBELDA AIGÜES

SUMMARY

This subject deals with the study of both parasitic and free-living nematodes. Special interest is given to pathogenic species and the role of nematodes in ecosystems, as well as their possible use as bioindicators of ecosystem quality.

The aim is for students to acquire basic knowledge of nematology and its current development, especially its applied aspects. They must also become familiar with the main trophic groups in which they are integrated and the techniques that allow their extraction, collection and identification.

It is essential that they understand the importance of pathogenic species, that they learn to recognise them and assess the damage they can cause, that they are aware of their biological, ecological, economic and health importance.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

There are no specified enrollment restrictions with other subjects of the curriculum.

OTHER REQUIREMENTS

None.

COMPETENCES / LEARNING OUTCOMES

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Awaken interest in the social and economic application of science.

Be able to access the information required (databases, scientific articles, etc.) and to interpret and use it sensibly.

Be able to make quick and effective decisions in professional or research practice.

Encourage ethical commitment and environmental awareness.

Favour intellectual curiosity and encourage responsibility for one's own learning.

Stimulate the capacity for critical reasoning and for argumentation based on rational criteria.

Students should communicate conclusions and underlying knowledge clearly and unambiguously to both specialized and non-specialized audiences.

DESCRIPTION OF CONTENTS

1. Nematodes. General concepts.

Introduction. Objectives. Morphological characteristics of parasitic and free-living nematodes. General classification.

2. Detection and study of animal parasitic nematodes.

Study techniques: digestion and other detection methods; dissection, clearing and preparation of microscopic slides.

3. Detection and study of edaphic nematodes.

Methods and techniques for sampling, extraction, mounting and identification of edaphic and meiobenthic nematodes.

4. Diversity of parasitic nematodes

Observation of morphological features with magnifying glass and microscope. Use of specialised keys.

5. Diversity of edafic and phytopathogenic nematodes.

Observation of morphological features with magnifying glass and microscope. Use of specialised keys.

6. Diversity of meiobenthic nematodes.

Observation of morphological features with magnifying glass and microscope. Use of specialised keys.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Theory	3,00
Laboratory	27,00
Total hours	**30,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	5,00
Independent study and work	16,00
Preparation of lessons	6,00
Preparation for assessment activities	0,00
Resolution of case studies	18,00
Total hours	**45,00**

TEACHING METHODOLOGY

At the beginning of the course there will be an outing to have a first practical contact with the ecological and economic implications of nematofauna, taking advantage of the season of greatest biological activity. The following sessions will begin with a theoretical content session, to later focus on the practical sessions that represent the bulk of the course. The practical activities will also include theoretical questions.

Samples will be taken both in the laboratory and in the field. These will be studied and identified in the laboratory. Students will produce a practical booklet in which they will include all the details about the different study techniques. In the last session, different aspects related to free-living nematodes will be presented in seminars.

EVALUATION

For the assessment of learning, each student will produce a report/booklet on the practical sessions, where it will be necessary to accredit the knowledge acquired, both theoretical and practical. As continuous assessment, the practical sessions will be linked to questionnaires that the student will have to answer. It will also be necessary to show the material worked on during the classes and the presentation of the preparations. The different partial contributions of the qualifications will be the following:

Report and Seminar..... 60%
Continuous evaluation of practical aspects..... 40%

REFERENCES

- Abolafia, J. & Peña-Santiago, R. 2003. Nematodes of the order Rhabditida from Andalucía Oriental, Spain. The genus Acrobeloides (Cobb, 1924) Thorne, 1937 with description of A. arenicola sp. n. and a key to its species. Journal of Nematode Morphology and Systematics, 5 (2002): 107-130.

- Abolafia, J. & Peña-Santiago, R. 2006. Nematodes of the order Rhabditida from Andalucía Oriental, Spain. The family Panagrolaimidae, with a compendium of species of Panagrolaimus and a key to their identification. Journal of Nematode Morphology and Systematics, 8 (2005): 133-160.

- Abolafía, J. & Peña-Santiago, R. 2010. Nematodes of the order Rhabditida from Andalucia Oriental, Spain. The representatives of the families Peloderidae Andrássy, 1976 and Rhabditidae Öerley, 1880. Journal of Nematode Morphology and Systematics, 13: 1-28.

- Andrássy, I. 1984. Klasse Nematoda (Ordnungen Monhysterida, Desmoscolecida, Araeolaimida, Chromadorida, Rhabditida). Gustav Fischer Verlag, Stuttgart, Deutschland.

- Bongers, T. 1990. The Maturity Index: An Ecological Measure of Environmental Disturbance Based on Nematode Species Composition. Oecologia, 83: 14-19.

- Bongers, T. 1999. The Maturity Index, the evolution of nematode life history traits, adaptive radiation and cp-scaling. Plant and Soil 212: 13-22.

- Bongers, T. & Bongers, M. 1998. Functional diversity of nematodes. Applied Soil Ecology, 10: 239251.

- Ferris, H., Bongers, T. & De Goede R.G. 2001. A framework for soil food web diagnostics: extension of the nematode faunal analysis concept. Applied Soil Ecology, 18: 1329.

- Imaz, A., Hernández, M.A., Ariño, A. H., Armendáriz, I. & Jordana, R. 2002. Diversity of soil nematodes across a Mediterranean ecotone. Applied Soil Ecology, 20: 191-198.

- Imaz, A., Hernández, M.A., Ariño, A. H., Armendáriz, I. & Jordana, R. 2002. Diversity of soil nematodes across a Mediterranean ecotone. Applied Soil Ecology, 20: 191-198.

- Kaya, H. & Stock, P. 1997. Techniques in insects nematology. 281 324. In: Manual of techniques in insects pathology. Academic Press, San Diego. USA.

- Neher, D.A., Wu,J., Barbercheck, M.E.& Anas, O. 2005. Ecosystem type affects interpretation of soil nematode community measures. Applied Soil Ecology, 30: 4764.

- Ritz, K. & Trudgill, D.L. 1999. Utility of nematode community analysis as an integrated measure of the functional state of soils: perspectives and challenges. Plant Soil, 212: 111.

- Tytgat, T., De Meutter, J., Gheysen G. & Coomans, A. 2000. Sedentary endoparasitic nematodes as a model for other plant parasitic nematodes. Nematology, 2: 113-121.

- Anderson R. 2000. Nematode Parasites of Vertebrates: Their Development and Transmission. CABI Publishing, Wallingford, U.K.

- Brusca R. C., Giribet G. & Moore W. 2022. Invertebrates 4th Edition. Oxford University Press, Oxford, UK.

- Eyualem, A. Traunspurger, W. & Andrássy, I. 2006. Freshwater Nematodes: Ecology and Taxonomy. CABI Publishing, Oxfordshire, UK.

- Gaugler, R. & H. K. Kaya (Eds.). 1990. Entomopathogenic Nematodes in Biological Control. CRC Press, Boca Raton.

- Hunt, D.J. 1994. Aphelenchida, Longidoridae and Trichodoridae: Their Systematics and Bionomics. CAB International, Wallingford, U.K.

- Jairajpuril, M.S. & Ahmad, W., 1992. Dorylaimida - Freeliving, Predaceous and Plant parasitic. E.J. Brill, Leiden.

- Melgarejo, P., García-Jiménez, J., Jordá, M.C., López, M.M., Andrés, M. F. & Durán, N. 2010.

Patógenos de plantas descritos en España.2ª Edición. Ministerio de Medio Ambiente y Medio Rural y Marino, Sociedad Española de Fitopatología, Madrid. España.

- Moravec F. 1994. Parasitic Nematodes of Freshwater Fishes of Europe. Springer Publishing, New York, USA.

- Nicholas W.L. 1984. The biology of free-living nematodes. 2nd edition. Clarendon Press, Oxford.

- Siddiqi, M.R. 2000. Tylenchida: Parasites of Plants and Insects. CAB International, Wallingford, U. K.

- Starr, J. R., Cook, R. & Bridge, J. 2002. Plant Resistance to Parasitic Nematodes. CABI Publishing, Wallingford, U.K.