Universidad Zaragoza

Year : 2020/21

60443 - Master's Dissertation

Syllabus Information

Academic Year: 2020/21
Subject: 60443 - Master's Dissertation
Faculty / School: 100 - Facultad de Ciencias
Degree: 541 - Master's in Geology: Techniques and Applications
624 - Master's in Geology: Techniques and Applications
ECTS: 12.0
Year: 1
Semester: Annual
Subject Type: ---
Module: ---

1.General information

1.1.Aims of the course

1.2.Context and importance of this course in the degree

1.3.Recommendations to take this course

2.Learning goals

2.1.Competences

2.2.Learning goals

2.3.Importance of learning goals

3.Assessment (1st and 2nd call)

3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

The aim of this course is to provide the student with the basic tools to carry out an original research program in Geology. Thus, the chosen research topic should be related, in a general way, to some geological discipline. At the end of the course the student should be able to design and carry out in an independent way a geological investigation, and to organize, discuss and present the key results of the research to technical and general audiences.

The dissertation is the final outcome of the Master's degree. Each student must have a supervisor who is in charge of selecting the topic of research and of overseeing the development of the work. The total workload of the dissertation is 12 ECTS, which translates in 300 hours of autonomous work (including tutorial time with the supervisor)

4.2.Learning tasks

The Master's Dissertation does not have a fixed syllabus as each dissertation has its own particularities, methodologies, program and objectives. Thus, learning activities are tailored to each student. However, in general terms two learning activities are common to most dissertations:

- Independent field and laboratory work.
- Tutorials with the supervisor.

4.3.Syllabus

There is no fixed syllabus, and in each individual case the program should be developed by the student and approved by the supervisor. However, in order for the student to have a clear idea of the potential topics for the dissertation, a table is included here with a comprehensive list of all the topics, organized by the proponent organization (Earth Sciences Department, Spanish Geological Survey, Pyrinean Institute of Ecology, Aula Dei Soil Institute, Paleoymás, Control 7). Each potencial dissertation topic is followed by one or several digits in brackets, which correspond to the person (or persons) in charge of the topic. A second list with the name of all the researchers is also included below (in this second list numbers in brackets correspond to the topics listed in the first table).

Table 1. Research lines

Earth Sciences Department (University of Zaragoza)

1. Ceramic clays: Mineral transformations and uses [11]
2. Contact metamorphism of metapelites in the Pyrenees [11, 5]
3a. Geochemical modeling of low-temperature water-rock interaction processes [7, 17, 19]
3b. Geochemical prospecting of contaminated soils [7, 17, 19]
4. Study of low to medium enthalpy geothermal systems (water and travertines) [7, 17]
6a. Petrophysics of stone materials applied to the adaptation and improvement of their constructive uses [18]
6b. Sedimentology and geochemistry of the gypsiferous Tertiary materials in the Ebro Basin [18]
7. Geomaterials: Petrology applied to the study of stone-masonery materials form the Architectural Heritage [23, 7]
8. Arqueometry: Petrología and Geochemistry of historical ornamental rocks [23, 17]
9. Brittle structures and paleo-stress analysis [35, 4, 24]
10. Structural analysis and petro-structural analysis in the ductile domain [16]
11. Magnetic fabric analysis in deformed areas [16, 32, 13, 48]
12. Study of extensional and compressive basins from tectonics-sedimentation relations [24, 25, 16, 13]
13. Geometry and kinematics of thrust belts [29, 24, 13]
14. Regional Tectonics and Paleomagnetism [13]
15. Active tectonics, morphotectonics and paleosismicity [35, 4, 24]
16. Analogue modelling applied to tectonic processes [32, 13, 35, 48]
17. Gravimetric and magnetic geological modelling [13, 32, 47]
18. Study of geological risks and cavity detection by means geophysical prospecting [13, 35]
19. Soil and rock mechanics and geological engineering [4, 55]
20. Sinkhole and landslide hazards [21]
21. Tectonic geomorphology and Palaeosismology [21]
22. Regional geomorphologic mapping and landscape evolution [21, 15]
24. Halokinesis and subsidence in Pyrenean diapirs [20]
25. Landslides as climatic proxies in the Pyrenees [20]
26. Surface water ersosion, hidrology and slope processes [15]
27. River dynamics and evolution [15]
28. Regional hidrogeology: update and new technologies [33]
29. Time series analysis in hydrogeology: piezometric, temperature, rain and gauge series [33]
30. Urban hydrogeology and geothermics [33, 42, 41]
31. Application of groundwater flow, mass and heat transport models [33]
32. Basin analysis. Influence of allocyclic factors on sedimentation: tectonics, climate and sea level variations [2, 8, 10, 25, 30, 31, 36]
33. Sedimentology: Environmental interpretation of continental deposits (modern and ancient examples) [2, 10, 25, 30, 31, 36]
34. Sedimentology: Environmental interpretation of marine deposits [8, 10, 36]
35. Cyclostratigraphy [2, 8, 10, 30, 36]
36. Ordovician Brachiopods [37]
37. Mesozoic Vertebrates, dinosaurs included [12, 56]
38. CT applied to the enamel structure of rodent teeth [14]
39. MG applied to the humerus of fossil Talpidae (Mammalia) [14, 38]
40. Artiodactyls ruminants (Mammalia) [9]
41. Paleoecology of Ordovician Brachiopods [37]
43. Paleoenvironmental reconstructions of the Mesozoic [12]

44. The meteoritic impact at the Cretaceous/Paleogene boundary: Paleoenvironmental reconstruction based on benthic foraminifers [1]

45. Ciclostratigraphy and paleoclimatology based on Paleocene planktonic foraminifers [3]

46. Paleoceanography based on Late Cretaceous planktonic foraminifers [6]

47. Analysis of climatic and paleoceanographic changes based on benthic foraminifers [1]

48. Past global warming events as analogues for the present climatic change: study based on benthic foraminifers and geochemical proxies [1]

49. Taphonomy and paleoecology of terrestrial mammals and paleoenvironmental reconstruction of Neogene continental basins [9]

50. Taphonomy of small vertebrate fossils [14]

51. Paleobiogeography of Ordovician Brachiopods [37]

52. Paleobiogeography of Mesozoic based on terrestrial tetrapods [12]

55. Tetrapod extinctions during the Mesozoic [12]

56. Biostratigraphy based on Late Cretaceous planktonic foraminifers [6]

57. Extinction events during the late Cretaceous and at the Cretaceous/Paleogene boundary, based on planktonic foraminifers [6]

58. Analysis of extinction events and radiations based on planktonic foraminifers (Cretaceous/Paleogene and Paleocene/Eocene boundaries) [3]

59. Diversity patterns and turnovers on terrestrial realms during the last 20 Ma [9]

60. Natural Sciences Museum of the University of Zaragoza [12, 56]

Spanish Geological Survey (IGME, Zaragoza Branch)

62. Characterizaction of Miocene climatic changes in the Ebro Basin using magnetic properties [44]

63. Geochemistry of the atmosphere and environmental magnetism [46, 44, 45]

64. Magnetic susceptibility as a tool to quantify soil pollutants [47, 39]

65. Magnetostratigraphy of paleontological sites [47]

66. Theoretical models of the statistical significance of the fold test as a function of the fold obliquity and the Fisher parameter [47]

67. Rock magnetism in remagnetized rocks (a N-S section of the Pyrenees) [47]

68. Automatic scanning of analog models [47]

69. Interpretation of seismic lines in geological structures [48]

70. Microstructural analysis and blastesis-deformation relations in metamorphic areas [40]

71. Structural characterization of the Variscan deformation from the analysis of the relationship between different anisotropies of rocks (stratification, tectonic foliations, faults, etc.) [40]

72. Assessment of recharge and hydrogeological flow in high relief areas [43]

73. Wetlands-groundwater relationships [43]

74. Thermal hysteresis cycles in the Zaragoza urban aquifer [42, 41]

75. Reactive transport models as a tool for the assessment of the geochemical impact in thermal remediation strategies in an urban aquifer [41]

76. 3D fossil reconstructions [49]

77. Palaeobiology of Paleozoic invertebrates [49]

Pyrenean Institute of Ecology (CSIC)

78. Palaeoclimatic reconstruction using cave deposits [52, 34]

79. Palaeoenvironmental reconstruction and lacustrine deposits in the Iberian Peninsula and Chile [53, 52]

80. Vegetation changes in the Iberian Peninsula during the last glacial cycle: pollen and coal analysis [51, 50]

Estación Experimental de Aula Dei (CSIC)

81. Erosion and redistributions assessment using radiotracers [54]

82. Fingerprinting techniques for the basin-scale identification of sediment origin [54]

Control7

83. Geotechnics and Soil Mechanics [55]

84. Environment: contaminated soils and water quality [55]

Table 2. Researchers

In the following table numbers in brackets refer to research lines in Table 1

Earth Sciences Department (University of Zaragoza)

1. Alegret Badiola, Laia [44, 47, 48]
2. Arenas Abad, Mª Concepción [32, 33, 35]
3. Arenillas Sierra, Ignacio [45, 58]
4. Arlegui Crespo, Luis [9, 15, 19]
5. Arranz Yagüe, Enrique [2]
6. Arz Sola, José Antonio [46, 56, 57]
7. Auqué Sanz, Luis Fco. [3, 4, 7]
8. Aurell Cardona, Marcos [32, 34, 35]
9. Azanza Asensio, Beatriz [40, 49, 59]
10. Bádenas Lago, Beatriz [32, 33, 34, 35]
11. Bauluz Lázaro, Blanca [1, 2]
12. Canudo Sanagustín, José Ignacio [37, 43, 52, 55, 60]
13. Casas Sainz, Antonio [11, 12, 13, 14, 16, 17, 18]
14. Cuenca Bescós, Gloria [38, 39, 50]
15. Desir Valen, Gloria [22, 26, 27]
16. Gil Imaz, Andrés [10, 11, 12]
17. Gimeno Serrano, María José [3, 4, 8]
18. Gisbert Aguilar, Josep [6]
19. Gómez Jiménez, Javier [3]
20. Guerrero Iturbe, Jesús [24, 25]
21. Gutiérrez Santolalla, Francisco [20, 21, 22]
23. Lapuente Mercadal, María Pilar [7, 8]
24. Liesa Carrera, Carlos [9, 12, 13, 15]
25. Luzón Aguado, Arantxa [32, 33, 35]
29. Millán Garrido, Hector [13]
30. Muñoz Jiménez, Arsenio [32, 33, 35]
31. Pérez García, Antonio [32, 33]
32. Román Berdiel, Teresa [11, 16, 17]
33. Sánchez Navarro, José Ángel [28, 29, 30, 31]
35. Simón Gómez, José Luis [9, 15, 16, 18]
36. Soria de Miguel, Ana Rosa [32, 33, 34, 35]
37. Villas Pedruelo, Enrique [36, 41,51]
38. Yañiz, Jesús (EPSH, UZ) [39]

Spanish Geological Survey (IGME, Zaragoza Branch)

39. Causapé Valenzuela, Jesús [64]
40. Clariana García, Pilar [70, 71]
41. García Gil, Alejandro [30, 74, 75]
42. Garrido Schneider, Eduardo [30, 74]
43. Lambán Jiménez, L. Javier [72, 73]
44. Larrasoaña Gorosquieta, Juan Cruz [62, 63]
45. Mochales López, Tania [63]
46. Pey Beltran, Jorge [63]
47. Pueyo Morer, Emilio [17, 64, 65, 66, 67, 68]
48. Soto Marín, Ruth [11, 16, 69]
49. Zamora Iranzo, Samuel [76, 77]

Pyrenean Institue of Ecology (Spanish Research Council, CSIC)

50. Gil Romera, Graciela [80]

51. González Sampériz, Penélope [80]

52. Moreno Caballud, Ana [78, 79]

53. Valero Garcés, Blas [79]

Estación Experimental de Aula Dei (Spanish Research Council, CSIC)

54. Navas Izquierdo, Ana [80, 81]

Control 7

55. Gracia, Javier [19, 83, 84]

Paleoymás

56. Barco, José Luis [37, 60]

4.4.Course planning and calendar

The Master's Dissertation has a workload of 12 ECTS and can be started at the beginning of the academic year in October. To be able to start and carry on with the dissertation during the whole academic year, the students will have most Fridays free of teaching during both semesters. The dissertation can be defended in four different calls during the academic year: February, July, September, and December. The exact dates will be published in the website of the Faculty of Science well before the start of the academic year. The Master's Dissertation cannot be defended until all the courses (48 ECTS) are already passed.

Tracking the TFM:

At the end of the first semester, the student should give a 10-minute oral presentation addressing the following key points: 1) aim and objectives of the MSc Dissertation, 2) methodology, and 3) work programe timetable.

The oral presentation will be held in public session, with the supervisor, the coordinator of the degree, and some members of the Quality Assurance Committee present. The presentation date will be fixed within the first week of February.

The MSc Dissertation can be defended in four different calls during the academic year: February, July, September, and December. The exact dates will be published in the website of the Faculty of Science well before the start of the academic year. The Master's Dissertation cannot be defended until the rest of the MSc courses have been passed (48 credits).

4.5.Bibliography and recommended resources

There is no bibliography for this course.