# UNIVERSITÀ DEGLI STUDI DI PALERMO

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| **DEPARTMENT** | Scienze della Terra e del Mare |
| **ACADEMIC YEAR** | 2017/2018 |
| **MASTER'S DEGREE (MSC)** | GEOLOGICAL SCIENCES AND TECHNOLOGIES |
| **SUBJECT** | MICROPALEONTOLOGY |
| **TYPE OF EDUCATIONAL ACTIVITY** | C |
| **AMBIT** | 21015-Attività formative affini o integrative |
| **CODE** | 05231 |
| **SCIENTIFIC SECTOR(S)** | GEO/01 |
| **HEAD PROFESSOR(S)** | CARUSO ANTONIO Professore Ordinario Univ. di PALERMO |
| **OTHER PROFESSOR(S)** | |
| **CREDITS** | 6 |
| **INDIVIDUAL STUDY (Hrs)** | 98 |
| **COURSE ACTIVITY (Hrs)** | 52 |
| **PROPAEDEUTICAL SUBJECTS** | |
| **MUTUALIZATION** | |
| **YEAR** | 2 |
| **TERM (SEMESTER)** | 2° semester |
| **ATTENDANCE** | Not mandatory |
| **EVALUATION** | Out of 30 |
| **TEACHER OFFICE HOURS** | **CARUSO ANTONIO**<br>Monday 9:00 11:00 Stanza del Docente presso il plesso di Biologia Animale di via Archirafi 18, piano terra |

**DOCENTE:** Prof. ANTONIO CARUSO

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| **PREREQUISITES** | Knowledge of Paleontology and Geology |
| **LEARNING OUTCOMES** | Knowledge and understanding skills<br>Acquiring knowledge for the recognition of microfossils (foraminifers, calcareous nanoplankton, radiolarians, diatoms, ostracods). The course will in particular develop the knowledge about the foraminifers. The student will learn to date the rocks through foraminifers from the upper Paleozoic up to the recent, and treating the applications in the biostratigraphic, cronostratigraphic and paleoecological fields from Mesozoic and Cenozoic sedimentary marine sequences. Part of the course will be focused on understanding the phenomena which control climatic and environmental variations, providing the student with a valuable tool for processing data that cause the extinction and subsequent colonization of the microorganisms in the oceans. This approach will allow the student to have a wider vision of the biological events that have taken place in the planet.<br><br>Ability to apply knowledge and understanding<br>Ability to recognize and organize micro and macroscopic observations; Interpreting data for paleoclimatic, paleoecological and paleo-environmental reconstruction; Ability to date sedimentary rocks by using microfossils<br><br>Judgment autonomy<br>To be able to evaluate and determine the formation of sedimentary rocks in particular environments through the fossiliferous content, to obtain stratigraphic dating and reconstruct paleoenvironmental and paleoecological conditions. |
| **ASSESSMENT METHODS** | Examination includes two written and oral tests. The three-hour written test provides: 1) microscopic recognition of 1 thin section of sedimentary microfacies including recognition of microfossils and rock classification; 2) two washed sediments for the determination of microfossiliferous content for the dating of the sample; 3) the recognition of 10 kinds of benthic foraminifers.<br>The oral exam provides a thorough discussion of the course topics for a duration of 40 minutes.<br>The exam is developed in thirty-five. The vote will be considered for the average of the final vote. In particular, the written test (microfacies) will give a score of up to 5 points; For the wash a maximum score of 15 points and 10 points for the benthonic foraminifers. Obviously the highest scores are to be considered for the correct tests, the vote will be decreased depending on the degree of errors. As for the oral exam questions will be used to verify the degree of maturation on the subjects covered during the course, then they will be asked 10 questions with a single score of 3 points for each correct answer. The final vote will be mediated by the written test vote. Sufficient knowledge to obtain 18/30 is based on an assessment of surface preparation. |
| **EDUCATIONAL OBJECTIVES** | The main purpose of the course is to make the student able to recognize and use the main groups of microfossils treated, and in particular the foraminifers, for biostratigraphy, cronostratigraphy, chronology, paleoecology and paleoclimatology. The course aims to provide knowledge in the field of methodologies for the use of microfossils in oil research |
| **TEACHING METHODS** | Lectures 40 h, laboratory 12 h |
| **SUGGESTED BIBLIOGRAPHY** | Modern Benthic Foraminifera - Barun Sen Gupta, 1999, Kluver Academic Publishers pp.371<br>Evolution and Geological Significance of Larger Benthic Foraminifera, Marcelle K. BouDagher-Fadel, 2008, Elsevier, pp. 515<br><br>Atlanti per la consultazione<br>Pratical Manual of Oligocene to Middle Miocene Planktonic Foraminifera, 2005, Iaccarino S. & Premoli-Silva I. pp.124<br>Pratical Manual of Neogene Planktonic Foraminifera, 2007, Iaccarino S. & Premoli-Silva I. pp.122,, 39 plates<br>Pratical Manual of Mesozoic Planktonic Foraminifera, 2007, Iaccarino S. & Premoli-Silva I. pp.122,, 39 plates<br>Plantkon Stratigraphy, Bolli, H.M., Saunders, J.B. Perch-Nielsen, K. Cambrideg University<br><br>Appunti forniti dal Docente |

## SYLLABUS

| Hrs | Frontal teaching |
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| 3 | The first microorganisms on earth and evolution of unicellular organisms. Foraminifera, unicellular organisms appeared over 1 billion years ago. |
| 3 | The Fitoplancton. Compositional characters. Diatoms, Silicoflagellatse, Coccolithophorids, Dinoflagellates. trophic chain. Bio-geochemical role. |
| 2 | Radiolarians, structure and calcification. Ecology. Ostracods, ecology |

# SYLLABUS

| Hrs | Frontal teaching |
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| 2 | The foraminifers, the reproductive cycle. Ecology. Composition e<br>and types of tests |
| 2 | Systematic classification of the most important groups of benthic foraminifera. Allogromiina, Textulariina, Miliolina, |
| 2 | Systematic classification of the most important groups of benthic foraminifera. Fusulinina |
| 3 | Systematic classification of the most important groups of benthic foraminifera. Orbitolinidi, Alveolinidi |
| 3 | Systematic classification of the most important groups of benthic foraminifera. Orbitoidids, Nummulitids |
| 2 | Systematic classification of the most important groups of benthic foraminifera (Rotaliina) |
| 3 | Systematic classification of planktonic foraminifers. Stratigraphic ecology distribution and their importance in climatic reconstructions |
| 3 | Systematic classification at the genus-level of the benthic foraminifera of the Mesozoic |
| 3 | Systematic classification of the Cenozoic planktonic foraminifera (Paleogene-Oligocene) |
| 3 | Systematic classification at the genus-level of the benthic foraminifera of the Cenozoic (Neogene) |
| 3 | Eco-biostratigraphy applied to the paleo-environmental and paleoclimatic recostrunctions |
| 3 | Planktonic foraminiferal biostratigraphic schemes of the Meso-Cenozoic |

| Hrs | Workshops |
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| 2 | Microscopic recognition of test types in benthic foraminifers, ostracods, radiolarians, diatomes and coccolithophorids |
| 2 | Microscopic recognition of the benthic foraminiferal genera |
| 4 | Microscope recognition of the Mesozoic planktonic foraminifera |
| 4 | Microscope recognition of the Cenozoic planktonic foraminifera |