COURSE NAME

Name: **GEOTECHNICAL ENGINEERING**
Code: 101205
Curriculum: **DEGREE IN ENERGY ENGINEERING AND MINERAL RESOURCES** Year: 3
Name of the module to which it belongs: SPECIFIC TO MINING
Subject: GEOTECHNICAL ENGINEERING
Nature: OBRIGATORY Duration: FIRST SEMESTER
ECTS Credits: 5 Classroom hours: 50
Face-to-face classroom percentage: 40% Non-contact hours: 75

FACULTY DETAILS

Name: DAZA SÁNCHEZ, ANTONIO SERAFIN (Coordinator)
Department: MECHANICS
Area: GROUND ENGINEERING
Location of the office: GROUND ENGINEERING LABORATORY
E-Mail: me1dasaa@uco.es Phone number: 957213061

Name: GUTIÉRREZ-RAVÉ CABALLERO, JESÚS
Department: MECHANICS
Area: GROUND ENGINEERING
Location of the office: GROUND ENGINEERING LABORATORY
E-Mail: jgutierrezrave@uco.es Phone number: 957213062

SKILLS

CB2	Have and understand current and cutting-edge knowledge of the field of mining engineering.
CB4 CB5	Solve problems within the study area of Mining Engineering. Gather and interpret relevant data within the study area of mining engineering in order to make judgments that include reflection on social, scientific or ethical issues.
CB6	Transmit information, ideas, problems and solutions to both specialized and non-specialized audiences.
CB7	Possess learning skills necessary to undertake further studies with a high degree of autonomy.
CU2	Know and refine the user level of ITs.
CU3	Promote active job search habits and entrepreneurship skills.
CEEM4	Geotechnical Studies applied to mining, construction and civil works.
CEEM5B	Geotechnical tests. Sampling Techniques.

OBJECTIVES

Give the students the ability to analyse, calculate and operate geotechnical works: foundations, slopes, walls, dams, underground space and building pathology.

Carry out geotechnical tests in a geotechnical laboratory and in situ, also for soil characterisation, geomechanical classification of the rock mass, and terrain modelling and investigation.

CONTENTS:

1. Theoretical contents

TOPIC-1. INTRODUCTION. COMPONENTS. PARAMETERS.
TOPIC-2. ELASTIC AND DEFORMATION PROPERTIES.

TOPIC-3. COMPACTION AND PROCTOR, CBR, PLATE LOAD, COMPRESSION AND LAMBE TESTS.
TOPIC-4. FAILURE CRITERIA. SHEAR STRENGTH. TRIAXIAL TESTS.
TOPIC-5. SURVEYING FOR FOUNDATIONS, AND GROUND PRESSURES AND DEFORMATION.
TOPIC-6. SOIL CONSOLIDATION AND OEDOMETER TESTING FOR FOUNDATIONS.
TOPIC-7. GEOTECHNOLOGY OF ROCK REMOVAL. GEOMECHANICAL CHARACTERISATION. GEOTECHNICAL PLANNING APPLIED TO CIVIL WORKS.
TOPIC-8. SLOPE FAILURE MECHANISMS. SLOPE STABILITY.
TOPIC-9. HOEK-BROWN FAILURE CRITERIA.
TOPIC-10. GEOMECHANICAL CLASSIFICATIONS FOR TUNNELS. DESIGN AND CONSTRUCTION OF GEOTECHNICAL WORKS. GEOTECHNICAL STUDIES IN UNIQUE WORKS.
TOPIC-11. TUNNEL GEOTECHNICS. SUSTAINING THE UNDERGROUND SPACE
TOPIC-12. MINING, METALLURGICAL AND ENERGY WASTE DAMS

2. Practical contents.

Sampling and techniques. In situ static penetration tests.
Geotechnical rock tests: point load, bending, Brazilian and deformation.
In situ plate load test and visit to the geotechnical laboratory.
Lambe test, triaxial test and friction test on discontinuities and faults.
Oedometer and swelling pressure test. Calculation of settling and foundations.
Geomechanical stations. Sclerometer measurements and ***compass fracturing***. Geotechnical survey of trial pits and slopes.
Boreholes with continuous core. Geotechnical logging. Obtaining the Rock Mass Rating (RMR). Calculating the underground space support. Other geomechanical classifications.
Geomechanical stations for monitoring and surveillance. Visits to geotechnical works and unique works.
Analytical calculation of slopes, gradients and spoil tips. Flat, circular and polygonal failures. Kinematic and vector analysis. Push on walls.