

Academic Year: ( 2022 / 2023 )

Review date: 05/09/2022 09:28:53

Department assigned to the subject: Physics Department

Coordinating teacher: RAMIREZ JIMENEZ, RAFAEL

Type: Basic Core ECTS Credits : 6.0

Year : 1 Semester : 1

Branch of knowledge: Engineering and Architecture

## DESCRIPTION OF CONTENTS: PROGRAMME

1. Kinematics of the particle: velocity and acceleration. Rectilinear and curvilinear motion. Tangential and normal components of the acceleration.
2. Dynamics of the particle: forces. Newton's laws. Friction and Tension. Energy and work. Impulse and linear momentum. Conservative forces. Potential energy. Central forces. Angular momentum.
3. relative motion
4. Kinematics and dynamics of a system of particles: Center of mass. Reduced mass. Center-of-mass reference system. Energy, linear and angular momentum of a system of particles.
5. Kinematics and Dynamics of a rigid body: Angular momentum, moment of inertia and gyration radius. Equation of motion of the rigid body. Rotation kinetic energy.
6. Oscillations: the harmonic oscillator. Damped harmonic oscillator. Forced harmonic oscillator. Resonances. Normal modes. Small oscillations.
7. Waves: wave equation. Harmonic waves. Standing waves. Travelling waves. Phase velocity and Group velocity.

## LEARNING ACTIVITIES AND METHODOLOGY

AF1. THEORETICAL-PRACTICAL CLASSES. Knowledge and concepts students must acquire. Receive course notes and will have basic reference texts. Students partake in exercises to resolve practical problems

AF2. TUTORING SESSIONS. Individualized attendance (individual tutoring) or in-group (group tutoring) for students with a teacher. Subjects with 6 credits have 4 hours of tutoring/ 100% on-site attendance.

AF3. STUDENT INDIVIDUAL WORK OR GROUP WORK. Subjects with 6 credits have 98 hours/0% on-site.

AF8. WORKSHOPS AND LABORATORY SESSIONS. Subjects with 3 credits have 4 hours with 100% on-site instruction. Subjects with 6 credits have 8 hours/100% on-site instruction.

AF9. FINAL EXAM. Global assessment of knowledge, skills and capacities acquired throughout the course. It entails 4 hours (approx), 100% on-site

AF8. WORKSHOPS AND LABORATORY SESSIONS. Subjects with 3 credits have 4 hours with 100% on-site instruction. Subjects with 6 credits have 8 hours/100% on-site instruction.

MD1. THEORY CLASS. Classroom presentations by the teacher with IT and audiovisual support in which the subject's main concepts are developed, while providing material and bibliography to complement student learning

MD2. PRACTICAL CLASS. Resolution of practical cases and problem, posed by the teacher, and carried out individually or in a group

MD3. TUTORING SESSIONS. Individualized attendance (individual tutoring sessions) or in-group (group tutoring sessions) for students with teacher as tutor. Subjects with 6 credits have 4 hours of tutoring/100% on-site.

MD6. LABORATORY PRACTICAL SESSIONS. Applied/experimental learning/teaching in workshops and laboratories under the tutor's supervision.

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## ASSESSMENT SYSTEM

<b>% end-of-term-examination/test:</b>	60
<b>% of continuous assessment (assignments, laboratory, practicals...):</b>	40

SE1. FINAL EXAM. Global assessment of knowledge, skills and capacities acquired throughout the course. The final exam's weight is 60%. The final exam grade should be higher than 3 points out of a maximum grade of 10 points.

SE2. CONTINUOUS EVALUATION. Assesses papers, projects, class presentations, debates, exercises, internships and Lab reports. The weight of this part is 40%, of which 25% correspond to three midterm exams and the remaining 15% correspond to the works assigned during the Lab sessions. The attendance to Lab sessions is compulsory to pass the subject.

## BASIC BIBLIOGRAPHY

- P. Tipler & G. Mosca Physics for scientists and engineers, Freeman, 2003
- R.A Serway and J.W. Serway Physics for scientist and engineers, Thomson Brooks, 2004