ENGR 1020 FUNDAMENTALS OF MECHANICS (WSTC)

Credit Points 10

Legacy Code 700023

Coordinator Ben Kelley (https://directory.westernsydney.edu.au/search/name/Ben Kelley/)

Description This subject deals with the action and interaction of forces, moments and couples in two and three dimensions, on machine elements and simple structures. It examines the equilibrium of single bodies, of multi-body structures and of mechanisms. It then covers the dynamics of a particle. A systematic approach to solving practical engineering design problems is provided. The subject makes extensive use of vector algebra.

School Eng, Design & Built Env

Discipline Other Engineering And Related Technologies

Student Contribution Band HECS Band 2 10cp

Check your HECS Band contribution amount via the Fees (https://www.westernsydney.edu.au/currentstudents/current_students/fees/) page.

Level Undergraduate Level 1 subject

Pre-requisite(s) Students enrolled in 7034 Diploma in Engineering 7066 Diploma in Engineering Extended or 6033 Diploma in EngineeringBachelor of Engineering Studies must pass PHYS 0003 Foundation Physics 2 before enrolling in this unit

Equivalent Subjects ENGR 1018 - Fundamentals of Mechanics ENGR 1019 - Fundamentals of Mechanics (WSTC Assoc Degree)

Restrictions

Students must be enrolled at Western Sydney University, The College. Students enrolled in Extended Diplomas must pass 40 credit points from the preparatory subjects listed in the program structure prior to enrolling in this University level subject. Students enrolled in the combined Diploma/Bachelor programs listed below must pass all College Preparatory subjects listed in the program structure before progressing to the Year2 subjects.

Learning Outcomes

On successful completion of this subject, students should be able to:

1. Manipulate vectors in 2 dimensions and 3 dimensions
2. Use the equilibrium equations to evaluate unknown reactions and internal loads
3. Evaluate the member forces in planar trusses
4. Evaluate the inter-body forces in planar mechanisms
5. Calculate the acceleration of a body under the action of an unbalanced force or couple
6. Analyse static and kinetic friction
7. Construct bending moment and shear force diagrams
8. Replace a distributed force by a single equivalent force
9. Identify under-constrained and statically indeterminate problems
10. Take measurements in the real world and use them to verify the theory presented in the lectures

Subject Content

1. Statics in two dimensions
- Vectors
- forces Moments and Couples
- Free body diagrams
- Equilibrium
- Friction
- Trusses
- Frames and machines
2. Statics in three dimensions
3. Translational Dynamics
- Acceleration
- The work-energy equation
- potential energy
4. Rotational Dynamics
5. Beam Diagrams
- Internal Loads
- Bending Moments and Shear Force diagrams
- Distributed forces

Assessment

The following table summarises the standard assessment tasks for this subject. Please note this is a guide only. Assessment tasks are regularly updated, where there is a difference your Learning Guide takes precedence.

Type	Length	Percent	Threshold	Individual/ Group Task
Practical	2 hours each	20	N	Both (Individual & Group)
Quiz	30 minutes	15	N	Individual
Intra-session Exam	1 hour	15	N	Individual
Final Exam	2 hours	50	N	Individual

Prescribed Texts

- Hibbeler, RC 2015, Engineering mechanics: statics, 14th Global edn, Pearson, Harlow, England
- Hibbeler, RC 2016, Mechanics for engineers: dynamics, 14th edn, Pearson, Harlow, England

Teaching Periods

Term 1 (2022)
Penrith (Kingswood)
Day
Subject Contact Ben Kelley (https://directory.westernsydney.edu.au/search/name/Ben Kelley/)

View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=ENGR1020_22-T1_KW_D#subjects)

Parramatta City - George St
Day
Subject Contact Ben Kelley (https://directory.westernsydney.edu.au/search/name/Ben Kelley/)

View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=ENGR1020_22-T1_PG_D#subjects)

Term 2 (2022)
Parramatta City - George St
Day
Subject Contact Ben Kelley (https://directory.westernsydney.edu.au/search/name/Ben Kelley/)

View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=ENGR1020_22-T2_PG_D#subjects)

Term 3 (2022)
Penrith (Kingswood)
Day
Subject Contact Ben Kelley (https://directory.westernsydney.edu.au/search/name/Ben Kelley/)

View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=ENGR1020_22-T3_KW_D#subjects)

Parramatta City - George St
Day
Subject Contact Ben Kelley (https://directory.westernsydney.edu.au/search/name/Ben Kelley/)

View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=ENGR1020_22-T3_PG_D#subjects)

Term 1 (2023)
Penrith (Kingswood)
On-site
Subject Contact Ben Kelley (https://directory.westernsydney.edu.au/search/name/Ben Kelley/)

View timetable (https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=ENGR1020_23-T1_KW_1#subjects)

Parramatta City - George St
On-site
Subject Contact Ben Kelley (https://directory.westernsydney.edu.au/search/name/Ben Kelley/)

View timetable (https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=ENGR1020_23-T1_PG_1#subjects)

Term 2 (2023)
Parramatta City - George St
On-site
Subject Contact Ben Kelley (https://directory.westernsydney.edu.au/search/name/Ben Kelley/)

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