The Hong Kong University of Science and Technology

UG Course Syllabus Template

Course Title: Introduction to engineering composite materials

Course Code: MECH3400

No. of Credits: 3 credits

Pre-/co-requisites: Mechanics of materials, Matrix algebra or equivalent

Name of Instructor: Fan SHI

Email: maefanshi@ust.hk

Course Description

[Briefly describe the course content, key topics or themes, objectives, methods of instruction, e.g., lectures, discussions, projects].

ME3400 mainly cover the following aspects: (1) Introduction to composite and engineering materials, including definition, types, manufacturing process and applications; (2) Micromechanics for lamina, including rule of mixture and a series of physical models; (3) Macromechanics of lamina, including general anisotropic model, stiffness/compliance matrix and the use for modelling strain/stress; (4) Lamina strength and failure, including failure modes and mechanisms, strength under different loading conditions; (5) Inspection and maintenance of composite structures, including various Non-destructive evaluation methods for assessing the structural integrity and quality of composite materials. The main objective is to let the students be familiar with the basic ingredients of composite materials, learn how to analyse the mechanics of composite using different models, and learn basic NDE methods for inspecting composite structures particularly used for aerospace applications. The course will include two lab demonstrations for mechanical load tests of composite lamina and ultrasonic inspection of defects in composite products. The course will also include a site visit to a local industrial company for the students to have more in-depth understanding of engineering applications in real world.

Assessments:

[List specific assessed tasks, exams, quizzes, their weightage]

Assessment Task	Contribution to Overall Course grade (%)
Homework	30%
Midterm	20%
Final project	40%
Lab and site visit	10%

Required Texts and Materials

[List required textbooks, readings, and any other materials]

Engineering Mechanics of Composite Materials, IM Daniel & O Ishai, 2nd, 2006

[Optional] Additional Resources

[List any additional resources, such as online platforms, library resources, etc.]: N.A.