

FACULTY OF **ENGINEERING**

DEGREE COURSE: **INDUSTRIAL ENGINEERING BS**

SUBJECT: ENGINEERING DRAWING

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OBJECTIVES

The course aims to teach how to read and produce engineering drawings thanks to the knowledge of the main relative international standards.

CONTENTS

Engineering drawing: Engineering role during the design/manufacture stages, technical product documentation, vocabulary, terms related to engineering drawings, fundamental principles and types of drawings, title block, position references and BOM, scale, line thickness and application, squaring, folding of sheets.

Standards and unification: historical outline, reasons, standards.

Types of projection: Projections of points to a plane, deformation factor, types of projection, perspective projection, axonometric projection, orthographic projection.

Orthographic projection: choices and arrangement of views, first and third angle projections, execution methods, particular views, local views, fillets, conventional representations.

Sections: definition, fundamental principles, cutting planes, part and half sections, revolved and removed sections, hatching, un-sectioned components.

Dimensioning: Definition, dimensioning methods, projection and dimensions lines, dimensioning guidelines, dimensioning types and conventions, functional dimensioning, dimensioning and associated tolerances.

Roughness, dimensional and geometrical tolerances: Surface textures, roughness parameters, machining symbols, fundamental principles for tolerancing, general tolerances, ISO limits and fits, geometrical tolerancing and datums, applications of geometrical tolerances, maximum material principle.

Threads and threaded elements: Fundamental principles, definitions, standard threads, Whitworth threads, Gas threads, representation of threads, threaded elements (screws, nuts, bolts, studs, ...).

Connections and weldings: connections through threaded elements, shaft-hub connections, representations of welds, permanent and elastic connections.

Guideways: Prismatic and rotational guideways, bearings, transmissions.

CAD systems: Introduction, CAD systems features, role in the development process, modelling of surfaces and solids

LEARNING OUTCOMES

At the end of the course students:

- are expected to be able to read engineering drawings of components as well as of assemblies
- will understand orthogonal projections, representation conventions, dimensioning indications, manufacturing tolerance prescriptions
- will be able to draw dimensioned sketches of components and assemblies following the international engineering drawing standards
- will demonstrate their capacity of recognizing and describing components and solutions which are commonly used in the mechanical and industrial field.

ASSESSMENT

Written exam: multiple choice and open questions

RECOMMENDED TEXTBOOKS

Colin H. Simmons, Neil Phelps, Dennis E. Maguire, "Manual of Engineering Drawing: Technical Product Specification and Documentation to British and International Standards". Eds. Butterworth-Heinemann, Fourth Edition, 2012. ISBN: 978-0-08-096652-6. Available for Kindle.
