NATIONAL UNIVERSITY OF ENGINEERING

COLLEGE OF PETROLEUM AND PETROCHEMICAL ENGINEERING

PETROLEUM AND NATURAL GAS ENGINEERING PROGRAM

PH111 – TECHNICAL DRAWING

I. GENERAL INFORMATION

CODE	**:**	PH111 Technical Drawing.
SEMESTER	**:**	1
CREDITS	**:**	2
HOURS PER WEEK	**:**	4 (Theory–Practice)
PREREQUISITES	**:**	None
CONDITION	**:**	Compulsory

II. COURSE DESCRIPTION

The course aims to provide students the basic knowledge of technical drawing required for the graphical representation of objects in engineering fields. Students carry out different geometric constructions, construct the main views of spatial objects, and draw basic planes properly using drawing instruments and software applications.

III. COURSE OUTCOMES

At the end of the course, students:

1. Knows and use main drawing tools and instruments, as well as drawing software applications.
2. Construct geometric figures properly using geometric methods.
3. Apply standard sizing techniques in the representation of simple objects.
4. Interpret planes and drawings according to standards.
5. Construct the three main views of a three-dimensional object.
6. Applies the concepts of total section, semi-section and stepped in the representation of three-dimensional objects.
7. Know the representation of union elements, as well as identify electrical, hydraulic and pneumatic planes.

IV. LEARNING UNITS

1. INTRODUCTION

Drawing instruments / Formats and sizing standards / Scales: enlargement, reduction, natural size / Tracing regulations: standard lines, letters and numbers / Geometric figures tracing / Division of segments and angles / Union of two straight lines by a circular arc of radius “r” / Union of two circular arcs by a circular arc of radius “r” / Union of a circular arc and a straight line by a circular arc of radius “r”.

2. DIMENSIONING, PERSPECTIVES AND REPRESENTATION SYSTEMS

Dimensioning standards / Dimensioning types: plane reference, axis of symmetry / Cavalier and cabinet projections / Dimetric and isometric projections / ISO-E system features / ISO-A system features / Six views development / Three main views.

3. SECTION VIEW

Total section / Semi-section / Partial section / Section representation of different materials.

4. REPRESENTATION OF UNION ELEMENTS

Inner thread / Outer thread / Front and side threads representation / Outer, inner and invisible threads in section representation / Dimensioning of threads / Bolts, screws and hexagonal nuts representation / Inner and outer thread representations in section assemble.

5. ENGINEERING PLANES

Assembling and dismounting planes / Electrical planes / Hydraulic planes / Construction planes / Instrumental knowledge / Plane development / Topography altimetry and planimetry.

V. PRACTICAL EXPERIENCES

Session 1: Applied geometry
Session 2: Projections
Session 3: Sections
Session 4: Union elements
Session 5: Planes

VI. METHODOLOGY

The course takes place in theory and practice sessions. In theory sessions, faculty presents the concepts, methods and applications. In practice sessions, students complete practice works on projections, sections, projections and planes properly using drawing instruments, software applications, and applying proper norms and standards. Student active participation is promoted.

VII. GRADING FORMULA

The Final Grade PF is calculated as follow:

PF = PP

PP: Average of Practical Works

VIII. BIBLIOGRAPHY

1. LOMBARDO J. JHONSON L. SHORTW.
   Technical Drawing, Continental Engineering Co.
2. SHNIEDER W.
   Technical Drawing - Manual, Reverte Editorial.
3. SCHMIDT O.
   Technical Drawing, Leipzing Editorial.