Professional Diploma in Oil and Gas Course Syllabus

Year 1	**ECTS**	**SEMESTER**	**Periods per Week**
Compulsory Modules			
English Language I	5	A	2
English Language II	5	B	2
Introduction to Mechanics	5	A	2
Mathematics for Technicians	10	A	4
Introduction to Petrochemistry, Petrochemical Processes and Petroleum Geology	10	A	4
General Workplace Health and Safety	5	B	2
Midstream and Downstream Activities and Petrochemical Processing	10	B	4
Optional Modules			
Non Destructive Testing	5	B	2
Introduction to Material Science	5	B	2
Electrical Fundamentals	10	B	4
Year 2			
Compulsory Modules			
Reading Technical Drawings	5	A	2
Safety in Oil and Gas Fields and Environmental Awareness	5	B	2
Optional Modules			
Lathe and Milling Machines	10	A	4
Industrial and Field Machine Elements	5	A	2
Advanced Material Technology	5	B	2
Fluid Mechanics	10	B	4
Machinery Maintenance	10	B	4
Fundamentals of Drilling Operations, Processes and Equipment	10	A	4
Casing and Cementing	5	A	2
Applied Well Technology and Well Control	10	YL	4
AC Electric Circuits	5	A	2
Instrumentation	10	A	4
Digital Systems and Electronic Devices	10	A	4
Power Systems and Motor Controls	10	B	4
Control	5	B	2
Electrical Installations and Regulations	10	YL	4
Welding Processes and Equipment	10	A	4
Fundamentals of Metallurgy	5	A	2
Blueprint Reading for Welders and Pipefitters	5	A	2
Practical Welding I	10	A	16
Weldability and Material Behaviour	5	B	2
Basic Pipefitting Skills	5	B	2
Practical Welding II	10	B	16

Module Content

English Language I

This is the first integrated skills module which has been designed to help students improve their competence in English in terms of language reading, writing, listening and speaking, and to develop effective communication skills in the English language, particularly in technical writing and oral presentations. Students will improve their ability to convey technical content clearly and convincingly in both writing and speaking in a work environment.

English Language II

This is the second integrated skills module which has been designed to help students improve their competence in English in terms of language reading, writing, listening and speaking, and to develop effective communication skills in the English language, particularly in technical writing and oral presentations related to Oil & Gas Technology.

Introduction to Mechanics

The module introduces students to the basic concepts of engineering science, mechanical engineering systems and electrical engineering. It builds on these principles to then develop students' knowledge and understanding of fundamental engineering principles and of the main processes used in the oil and gas industry.

Mathematics for Technicians

This module provides an understanding of the concepts and basic principles of mathematics for solving engineering problems. The mathematical skills developed in this module will be applied in other areas of study on the program

Introduction to Petrochemistry, Petrochemical Processes and Petroleum Geology

The module is focused at new graduates wanting to gain a broad and applied technical background that prepares them for a professional career in the petroleum industry. The course aims to build upon some of the fundamental hydrocarbon geology and to cover the entire breadth of the E&P domain. It spans core disciplines that include: Basic hydrocarbon chemistry, Petroleum Geology, Exploration play concept, Offshore Facilities, Production, Oil and Gas Processing, etc.

General Workplace Health and Safety

This module introduces students to the fundamental principles and legislation for health, safety and environmental protection. Students will be familiarized with health, safety and environmental regulations and practices in the petrochemical industry and for working in dangerous environments, including offshore, drilling platforms and petrochemical plants.

Midstream and Downstream Activities and Petrochemical Processing
This module develops students' knowledge and basic understanding of the midstream and downstream activities involved in the oil and gas industry, while introducing common concepts, technology, operations, processes and supply chain structures.

Non-Destructive Testing
The module aims to provide the students with a preliminary understanding of Non-Destructive Testing methods. It focuses on outlining the different testing techniques and corresponding equipment as well as the factors affecting the performance of certain testing methods.

Introduction to Material Science
This module introduces and extends a range of mechanical principles including the mechanics of solid structures and the mechanics of machines providing to the students the ability to develop problem solving techniques by analyzing the design and operation of mechanical engineering systems, focusing on subsea and offshore equipment and structures.

Electrical Fundamentals
This module aims to provide knowledge on fundamental theory of Electrical theory, applicable for understanding and solving simple DC and AC circuits.

Reading Technical Drawings
This module is designed to introduce students with basic knowledge on technical drawing and engineering symbols and provide them with the ability to interpret technical and engineering drawings and diagrams. Additionally, students will be able to practice their skills on CAD software.

Safety in Oil and Gas Fields and Environmental Awareness
This module provides an understanding of health, safety and environmental concerns in the hydrocarbon sector and be able to follow appropriate HSE management systems to improve performance.

Lathe and Milling Machines
This module offers the students the ability to to draw and read technical drawings and eventually to develop their practical skills using Lathe and Milling machines.

Industrial and Field Machine Elements
The module introduces students to the basic concepts of industrial and field machine elements in order to develop students' knowledge and understanding of these elements used not only in the oil and gas sector but in the domestic industry as well.

Advanced Material Technology
This module focuses on the corrosion science and mechanisms, with particular reference to the potential problems caused by corrosion in the oil and gas industry as well as to the underlying principles and applications concerning heat transfer and insulation of process equipment and fabrication.

Fluid Mechanics
The basic concept of this module is to raise students' awareness of some fundamental aspects of fluid motion, including important fluid properties, regimes of flow, pressure variations in fluids at rest and in motion, fluid kinematics and methods of flow description and analysis.

Machinery Maintenance
This module aims to develop theoretical knowledge and practical skills relevant to the maintenance and inspection of machines and plant commonly employed in the upstream and midstream aspects of the petrochemical industry.

Fundamentals of Drilling Operations, Processes and Equipment
This module aims to develop students' knowledge in drilling operations and equipment by investigating the areas of power systems, hoisting systems, rotating systems, circulating systems, well control and safety issues.

Casing and Cementing
This module aims to develop students' knowledge in casing and cementing practices during onshore and offshore drilling operations and to evaluate and solve casing and cementing design criteria that meet requirements at the lowest cost possible and application of relevant IT technique.

Applied Well Technology and Well Control
This module aims to enable students to develop their knowledge and applications of well technology and well control techniques, to review and evaluate the principles, procedures and equipment used to control well kicks, blowouts and apply techniques related to under balanced drilling. As well as to assess anticipated hole-problems and rock mechanics in planning a well, taking into account methods of preventing and curing.

AC Electric Circuits
This module aims at providing a comprehensive understanding of the fundamental theory of electric circuits. It is designed to build on aspects of AC theory studied in the Science module and will provide the basis of further study of electrical principles. The module relies on the use of mathematical analysis to support the underlying theory and the practical work.

Instrumentation
This module aims to develop an understanding of the concepts of instrumentation systems, the ability to analyze systems, the ability to select appropriate systems and equipment and the competence in analyzing results of tests effectively.

Digital Systems and Electronic Devices
This module is an introduction to basic Analysis and design techniques of digital circuits and systems. Topics include types of codes, number systems and arithmetic, Boolean algebra and logic simplification, combinational logic design, functions of simplification, combinational logic devices (PLD's) and finite state machines including counters.

Power Systems and Motor Controls
This module provides an understanding of electrical principles, electrical power systems and power distribution and the advantages and disadvantages of alternative energy sources as well as the economics of each component.

Control
The module aims to develop an understanding of the concepts of control systems, to develop the ability to analyse systems, to develop the ability to select appropriate systems and equipment and to develop competence in analysing results of tests effectively.

Electrical Installations and Regulations
This module aims at providing a comprehensive understanding of the fundamental theory of electric circuits that will be used to analyse the electricity and electrical services in building. This module also provides an understanding of the main principals of electrical supply and distribution in Building.

Welding Processes and Equipment
The aim of the module is to improve the general knowledge of the students on the basic principles and terminology of Welding Technology. This module focuses on the basic parameters of welding and the safety aspects of performing fabrications in a workshop. Active participation is encouraged through hands-on experiments and case studies, as well as an open discussion format.

Fundamentals of Metallurgy
The aim of this module is to offer essential and vital information regarding the industrial common type of steel and steel forming, in depth explanation of the effect of heat on steel, the effect of hydrogen & hydrogen scales, carbon equivalent, pre-heat and post heat as well as the weld-ability of steel, mechanical and physical properties of steel.

Blueprint Reading for Welders and Pipefitters
The aim of this course is to simplify the communication between the designer and the welder and covers welding symbols and their application to welding prints and practices.

Weldability and Material Behaviour
The purpose of this module is to introduce students to materials science and technology and to provide them an understanding of the characteristics and weldability of different materials, ranging from steels to non-ferrous materials.

Basic Pipefitting Skills
This module covers the basic, common, and core competencies required to competently perform task in pipefitting, such as cut, bevel and thread pipes, perform tack welding, install and fit-up overhead piping system.

Practical Welding I and II
The aim of this course is to develop an understanding of the theory, principles and applications of welding processes and to develop practical experience and competency in common welding techniques employed in industry.