

Faculty of Ocean engineering
Subject Code: C1711
Ocean Engineering and Underwater Technology

Module. 1	<p><u>Coastal Engineering</u> Different types of ocean structures and systems (fixed, floating, semi-submersibles, submersibles, pipelines, etc..) for exploitation and production of oil and gas, minerals and energy. Brief outline of planning, design and construction. Towing, launching and installation. Waves in shallow waters – Shoaling, refraction, diffraction and breaking– Interaction currents and waves- near shore currents-wave run-up and overtopping and earth material – platforms – Airborne, space borne – satellites Ocean sat. Optical sensors and thermal sensors – Thermal detectors, thermal radiometer – thermal infrared Satellites - types and sensor & scanner.</p>
Module. 2	<p><u>GIS & Ocean Engineering Sensors</u> Remote sensing: Introduction, principles of remote sensing, EMR interaction with atmosphere and earth material – platforms – Airborne, space borne – satellites Ocean sat. Optical sensors and thermal sensors – Thermal detectors, thermal radiometer – thermal infrared Satellites - types and sensors.... scanner. Introduction to GIS; Basics of ArcGIS; Geographic Coordinates Systems; Data creation (including geo-referencing images and on screen digitization), metadata; Addition of attributes; Geometrical calculations (e.g. calculation of area, perimeters)</p>
Module .3	<p><u>Engineering Mathematics</u> Partial Differentiation, Multiple Integrals - Solutions of Ordinary Differential Equations, Solutions of partial Differential Equations, Fourier series - Rank, Eigen Values and Eigen Vectors, Solution of system of linear equations - Vector Differentiation, Unit Normal, Unit Tangent, Gradient, Directional Derivative Curl, Divergence, Green’s Theorem, Stoke’s Theorem, Divergence Theore - Random Variables, Probability Distributions-Binomial, Poisson and Normal Distributions-Mean and Variance - Newtons’s Raphson Method, Euler’s Method, RungeKutta Method (IVth order).</p>
Module. 4	<p><u>Computer Programming</u> Operating Systems – Processes, Threads, IPC, Concurrency, dead lock, CPU scheduling, memory management, file systems, protection and security. Computer Organization - Evolution of Computer arithmetic, Instruction Format, Control Unit, I/O Organization, Memory Organization, addressing modes, Parallel Programming, cache and main memory.Databases - Database Models, Overview and concepts of Relational Database Model, normalization, Transaction management in Relational Model, Concurrency Techniques, Recovery in Databases Computer Networks - Reference Models: OSI, TCP/IP, Data Link Layer, MAC layer, Network Layer, Transport Layer, Presentation Layer, Session Layer, Application Layer, basic concepts of hubs, switches, gateways and routers.Programming and Data structure – Programming in C, identifiers, data types, operators, stacks, queues, arrays, linked lists, trees.</p>
Module. 5	<p><u>Electronics& Electrical</u> Electronics-Electronic circuits - Analog Circuits& Digital circuits- Communication Systems & network – Signals & System-Signal Processing-AC Fundamentals - laws of magnetic circuits, Phase relations and vector representation. Transformer - D.C. Machine - generator and motor - Measuring Equipment’s: Classification, Characteristics of different electrical measuring systems and equipment’s.</p>
Module .6	<p><u>Basic mechanical and civil engineering</u> Strength of materials, Mechanics of fluids, Thermodynamics, Materials engineering, Thermal engineering, Manufacturing Technology, Geotechnical engineering, Design of structures, IC Engines, Refrigeration and air conditioning system.</p>
Module. 7	<p><u>Basics of Research methodology</u> Foundations of Research, Research Design, Measurement and Scaling Techniques, Methods of Data Collection and Analysis, Techniques of Hypotheses, Parametric or Standard Tests, Analysis of Variance and Co-variance</p>