

SSEN - SUBSEA ENGINEERING

SSEN 630 Fundamentals of Subsea Engineering

Credits 3. 3 Lecture Hours. Orientation to subsea engineering fundamentals; includes SURF (Subsea, Umbilicals/Controls, Risers, Flowlines) equipment and configurations; exposure to practical, industry focused problems; subsea equipment components; design considerations and design drivers; subsea production operations; integrity critical maintenance activities. **Prerequisites:** Graduate classification, enrollment in the College of Engineering or approval of instructor.

SSEN 632 Subsea Project Implementation

Credits 3. 3 Lecture Hours. Overview of the realization of a subsea development project; includes all stages from discovery to pre-commissioning of the subsea infrastructure. **Prerequisite:** SSEN 630 or concurrent enrollment.

SSEN 633 Transition from Fossil Fuels

Credits 3. 3 Lecture Hours. Current status of energy supplies; overview of energy source trends and forecast of what will be seen in the future; examine renewable energy sources, their technology, what the challenges are and how will these be overcome; appraisal of how the transition will be founded on what we are doing now.

SSEN 640 Subsea Hardware Design

Credits 3. 3 Lecture Hours. Basic elements (bolting, seals, flanges & hubs, valves, fittings, connections, and actuators) that make up subsea hardware assemblies; understanding of how these elements work together in a system. **Prerequisites:** SSEN 630 or concurrent enrollment or approval of instructor.

SSEN 641 Subsea Umbilical and Control System Design

Credits 3. 3 Lecture Hours. A practical view of subsea umbilical and controls system project realization from concept selection through installation and offshore acceptance testing. **Prerequisite:** SSEN 630, or concurrent enrollment.

SSEN 642 Subsea Pipeline Design

Credits 3. 3 Lecture Hours. A practical view of pipeline project realization from concept selection through installation and offshore acceptance testing. **Prerequisites:** SSEN 630, or concurrent enrollment, or approval of instructor.

SSEN 643 Subsea Riser Design

Credits 3. 3 Lecture Hours. A practical view of riser project realization from concept selection through installation and offshore acceptance testing. **Prerequisites:** SSEN 630, or concurrent enrollment, or approval of instructor.

SSEN 644 Offshore Installation and Construction

Credits 3. 3 Lecture Hours. Overview of offshore installation and construction scope, equipment, and techniques with practical application on projects from design considerations, scheduling, bidding, detailed design, safety, and offshore operations from cradle to grave.

Prerequisites: SSEN 630, or concurrent enrollment, or approval of instructor.

SSEN 645 The Hydrogen Economy

Credits 3. 3 Lecture Hours. Advances in the hydrogen economy and hydrogen production from renewable sources; hydrogen storage, transport, delivery and utilization of clean energy using decarbonization methods; design and operation of hydrogen production hubs and equipment; integrity of critical maintenance activities; case studies of commercial applications; current technological challenges and innovations; economic and risk analyses and their controls.

Prerequisites: Graduate classification, enrollment in the College of Engineering or approval of instructor.

SSEN 646 Applied Reliability Engineering for Subsea Systems

Credits 3. 3 Lecture Hours. Overview of the application of reliability engineering to subsea system and all stages from discovery to pre-commissioning of the subsea infrastructure; exposure to practical, industry focused problems; risks and mitigation steps to reduce possibility of an accident or hazard; FMEACA, root cause analysis, TRLs, Risk Based Inspection (RBI) and Risk Based Integrity Management concepts, asset integrity and ALARP concepts, fault tree analysis, Principles of Safety Integrity Level (SIL). **Prerequisite:** SSEN 630 or concurrent enrollment, or approval of instructor.

SSEN 650 Flow Assurance and Operability of Subsea Systems

Credits 3. 3 Lecture Hours. Hydrocarbon production and transport from offshore fields to the host facilities, including prevention and remediation of phenomena that hinder fluid flow in production systems; subsea architecture, hydrodynamic and thermal considerations, reservoir fluid characterization and analysis, solids management, thermal hydraulics and production chemistry. **Prerequisites:** SSEN 630 or concurrent enrollment, or approval of instructor.

SSEN 651 Subsea Production Operations

Credits 3. 3 Lecture Hours. Multiphase hydrocarbon production and transport from offshore fields to host facilities under both steady-state and transient conditions; includes reservoir and SURF system management through chemical gas and water injection, surface and subsea processing, testing and maintenance through all phases of a subsea development. **Prerequisites:** SSEN 630 or concurrent enrollment, or approval of instructor.

SSEN 681 Professional Development Seminar-Subsea Engineering

Credit 1. 0 Lecture Hours. 1 Other Hour. Professional seminar introducing students to the latest topics in subsea engineering. Must be taken on a satisfactory/unsatisfactory basis. **Prerequisite:** SSEN 630 or current enrollment, or approval of instructor.

SSEN 684 Professional Internship

Credits 1 to 10. 0 Lecture Hours. 1 to 10 Other Hours. Supervised experience of one academic year in industry where students can learn to apply their textbook-based skills to problems in the real-world environment. Must be taken on a satisfactory/unsatisfactory basis.

Prerequisite: SSEN 630 or approval of instructor.

SSEN 685 Directed Studies

Credits 1 to 6. 1 to 6 Other Hours. Design or research problems related to subsea engineering. **Prerequisite:** Graduate classification; approval of program director or designate.

SSEN 689 Special Topics In...

Credits 1 to 4. 1 to 4 Other Hours. Selected topics in an identified area of subsea engineering. May be repeated for credit. **Prerequisites:** Graduate classification; approval of instructor.

SSEN 691 Research

Credits 1 to 23. 1 to 23 Other Hours. Research in the area of subsea engineering. Must be taken on a satisfactory/unsatisfactory basis.

Prerequisite: Graduate classification; approval of program director or designate.