

# 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 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; FMECA, 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 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.