16. MO18-5303 Tubular Joint Design

Module name	Tubular Joint Design
Module level, if applicable	Master
Code, if applicable	MO18-5303
Subtitle, if applicable	-
Course, if applicable	Tubular Joint Design
Semester	3rd Semester
Person responsible for the module	Dr.Eng. Rudi Waluyo Prastianto, S.T., M.T. Nur Syahroni, S.T., M.T.,Ph.D
Lecturer	Dr.Eng. Rudi Waluyo Prastianto, S.T., M.T. Nur Syahroni, S.T., M.T.,Ph.D
Language	Indonesian
Relation to curriculum	Elective course for master degree program in Ocean Engineering
Type of teaching, contact hours	Lecture, <50 students 150 minutes x 16 weeks per semester
Workload	4. Class, 3 × 50’ = 150 minutes per week 5. Independent Study, 3 × 60’ = 180 minutes per week 6. Structured Activities, 3 × 60’ = 180 minutes per week
Credit points	3 CREDITS ~ 4.8 ECTS CREDITS × 1.6 ECTS
Requirements according to the examination regulations	A student must have attended at least 80% of the lectures to sit in the exams.
Recommended prerequisites	-

Learning outcomes **and their corresponding PLOs**	CLO.1. Able to understand about tubular welded joint of offshore structures CLO.2. Able to understand the differences between Uni-planar and Multi-planar tubular joints. CLO.3. Able to understand the methods of measuring the stress at tubular joints (experimental physical & numerical). CLO.4. Able to understand and conduct analysis of the strength of the tubular joint.	LO.3. Able to carry out scientific and technological development in ocean engineering through independent research
	CLO.5. Able to understand and calculating the concept of hot-spot/ maximum stress (hot spot stress) in tubular joint design. CLO.6. Able to understand and calculate stress concentration factor for uni-planar and multi-planar tubular joints. CLO.7. Ale to understand design methodology for tubular joints (uni-planar and multi-planar). CLO.8. Able to understand and calculate fatigue life of tubular joints using computer software based on the Finite Element Method.	

Content	Tubular joint design is an elective course that supports the marine building design area of expertise at the master degree in Department of Ocean Engineering - ITS. This course studies the types, characteristics, strength and fatigue analysis of tubular joints in offshore platform structures and their design methodology. So that finally students have a deep theoretical understanding and are able to perform analysis with skills using computer-based software for the design of tubular connections on offshore structures that refer to applicable standards and regulations. This course contains of following materials: 1. Review of welded tubular joints in offshore structures. 2. Methods of measuring the stress at tubular joints (experimental physical & numerical). 3. Analysis of the strength of the tubular joint. 4. Uni-planar and Multi-planar tubular joints. 5. Concept of Hot-spot/Maximum Stress (hot spot stress) in tubular joint design. 6. Formula for stress concentration factor for uni-planar tubular junctions. 7. Stress concentration factor for multi-planar tubular junctions. 8. Design Methodology for tubular joints (uni-planar and multi-planar). 9. Fatigue at the Tubular Joint. 10. Local modeling and analysis of tubular joints using computer software based on the Finite Element Method.
Study and examination requirements and forms of examination	17. In-class exercise 18. Assignment 19. Mid-term exam 20. Final exam
Media employed	Offline: LCD, whiteboard, PowerPoint presentation Online: websites (myITS Classroom), Zoom, Microsoft Teams, PowerPoint presentation.

Reading list	1. "Background to new fatigue design guidance for steel welded joints in offshore structures', Report of the Department of Energy Guidance Notes, Revision Drafting Panel. HSMO, London, 1984. 2. "Marine Structural Design", Bai, Y. and Jin, W., Butterworth-Heinemann, 2015 3. Dover, W.D. and Glinka, G., *Fatigue of Offshore Structures*, EMASBOOKS: Offshore Structures Series, London, UK, 1988 4. DNV-RP-C203, *Fatigue Design of Offshore Structures*, Norway, 1988 5. API-RP2A WSD, Recommended Practice for Planning, Designing & Constructing Fixed Offshore Platforms – Working Stress Design, 21st Ed, USA, 2001 DNV-RP-C206, Fatigue Methodology for Offshore Ships of Offshore Structures, Norway, 2007 6.