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Assignment 1 – Intro to Subsea BOP Control Equipment and Systems

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EDLD-5318 _ **Instructional Design**

Lamar University

Course Name: Introduction to Subsea BOP Control Equipment and Systems
Course Goal: Learners will understand the purpose, function, similarities, and differences of Blow Out Preventors (BOPs) used in onshore and offshore operations.

LEARNING GOALS	LEARNING ACTIVITIES	ASSESSMENT ACTIVITIES
Week 1- Foundational 1: Learners will review the beginnings of onshore drilling history and analyze the operational concerns that brought about the need for the Blow Out Preventer (BOP).	**Read**: Blowout Preventer, 4th Edition https://petex.utexas.edu/publications/books/drilling/387-blowout-prevention-4th **Watch**: History of Oil Part 1, 2, 3 of 5 • https://www.youtube.com/watch?v=s_52IcYY8bQ • https://www.youtube.com/watch?v=q9cd29Dxfzw • https://www.youtube.com/watch?v=nil52OqvwQs Oil Men – Tales from The South Texas Oil Patch • https://www.youtube.com/watch?v=ojKxgCZ7NlM How Does a Blowout Preventer Work? • https://www.youtube.com/watch?v=La0-ewozyK4 • https://www.youtube.com/watch?v=7cgoxVhsK5o	**Reflect**: On the progression of oil and gas drilling, and the before and after impact of BOP operations. **Discussion** Participate in a class discussion with your peers in reviewing the challenges of drilling for oil that led to the rise of pressure control safety equipment. Points to consider: - The relationship between *depth* and *pressure* - Is this relationship *directly* or *inversely* proportional?
Week 2- Foundational 2: Learners will analyze the operational concerns that brought about the need for industry standards, classification of, and design changes for BOPs used offshore versus onshore.	**Read**: Code of Federal Regulations (CFR) • Subpart D – Oil and Gas Drilling Operations, Section 250.440, • Subpart P – Sulphur Operations, Sections 250.1610 & 250.1611 *Blowout Preventer Requirements:* https://www.govinfo.gov/content/pkg/CFR-2011-title30-vol2/pdf/CFR-2011-title30-vol2-chapII-subchapB.pdf	**Reflect**: - On the similarities and differences of BOPs used onshore and offshore. - On the role of Bureau of Safety and Environmental Enforcement (BSEE) **Discussion** Participate in a discussion with your peers in reviewing: - What is the function of the BSEE?

	Review and discuss the validity of the concerns and why the needed changes.	- Why is the BSEE's role critical to operations conducted within the Outer Continental Shelf?
Week 3- Application: Learners will analyze, evaluate, and identify the situational factors of Mobile Offshore Drilling Units (MODUs) mitigating impact on the BOP's operations.	**Read**: Given articles on Jack-up, semi-submersible, and drill ships. Review the critical auxiliary systems needed for effective operation of the BOP on each of the different MODUs. **Watch**: *MODUs:* *https://www.wartsila.com/encyclopedia/term/mobile-offshore-drilling-unit-(modus)*	**Reflect**: On the geographical locale offshore impacting the choice selection of drilling MODUs. **Discussion** Participate in a class discussion addressing the importance of BOPs, what is the difference between land and offshore systems, and why the need for the design differences.
Week 4- Integration 1: Leaners will analyze, develop, and justify a response to a given offshore case study scenario for utilizing a class of BOP. **Week 4- Integration 2**: Learners will analyze a disassembled BOP and effectively reassemble given the classification nomenclature.	**Read**: Review and study a given real world case scenario requiring a BOP. Create and develop a response for the class of BOP selected discussing the necessary stack components and auxiliary systems. **Watch**: *Stack Components and auxiliary systems:* • *https://www.youtube.com/watch?v=ahaANaR4lBw* • *https://www.youtube.com/watch?v=wUtRTUuC9tQ* • *https://www.youtube.com/watch?v=vhsjQeFd3-o* • *https://www.youtube.com/watch?v=wUtRTUuC9tQ*	**Discussion**: Participate in a peer group discussion and review activity on - The differences between an Annular BOP vs a Ram BOP.
	Activity: Correctly match disassembled parts in the correct sequence in successfully reconstructing the BOP	**Assessment**: Complete an online graphic activity: Mix & Match" BOP stack components in the correct assembly order.
Week 5 - Human Dimensions /Caring: Learners will analyze their role response to the importance of human factors impacting the	**Activity:** Review and study a given real world case scenario detailing the disaster and failure of the BOP. **Watch**:	**Discussion:** Peer group discussion and review activity of case study disaster causes and effects, and the regulatory response.

Health, Safety (HSE) and Environment of all parties concerned.	*Deepwater Horizon Macando Video:* *https://www.youtube.com/watch?time_continue=38&v=FCVCOWejlag&feature=emb_logo* *Deepwater Horizon Macando Explosion & Fire, Volumes 1 & 2* • https://www.csb.gov/assets/1/7/vol_1_final.pdf • https://www.csb.gov/assets/1/7/20140605_macondo_vol2_(0605v1).pdf Code of Federal Regulations Subpart D – Oil and Gas Drilling Operations, Section 250.440 *Blowout Preventer Requirements* https://www.govinfo.gov/content/pkg/CFR-2011-title30-vol2/pdf/CFR-2011-title30-vol2-chapII-subchapB.pdf	**Reflect**: Reflecting on the Macando disaster, create, develop, and submit a response identifying the failure of mechanical and human factors contributing to the blowout.

1. Specific Context of the Teaching/Learning Situation

a. How many students are in the class? - Minimum 1, Maximum 12

b. What is the course level? - Post-secondary, undergraduate

c. How long and frequent are the class meetings? - 5 days from course start

d. How will the course be delivered? - Blended, online

e. What physical elements of the learning environment will affect the class? - Not Applicable

f. What technology, networking and access issues will affect the class? - Accessible by desktop, tablet, or mobile phone, content responsively adaptable to either media.

2. General Context of the Learning Situation

What learning expectations are placed on this course or curriculum by:

Course meets International Accreditation of Drilling Contractors (IADC) for onboarding personnel entering the field of subsea operations.

Course satisfies continuing education units (CEUs) and professional development hours (PDHs) for engineering professionals needing mandatory hours to maintain credentialed licensing.

3. Nature of the Subject

a. Is this subject primarily theoretical, practical, or a combination? - Both, Combination

b. Is the subject primarily convergent or divergent? - Convergent

c. Are there important changes or controversies occurring within the field? - Safety Concerns/Challenges and Cost Impact are driving (fast tracking) the integration of Artificial Intelligence operations automation

4. Characteristics of the Learners

a. What is the life situation of the learners (e.g., socio-economic, cultural, personal, family, professional goals)?
- Typically, already working in and around the related industry; ethnically and culturally truly diverse; range from Generation X to Generation Z; single, married; very goal orientated with well-defined entry and exit strategies within the field.

b. What prior knowledge, experiences, and initial feelings do students usually have about this subject?
- Entry level hands-on experience, knowledge shared from family members and friends in the field, enter this profession for the high lucrative returns and the favorable mobilization and demobilization work schedules.

c. What are their learning goals and expectations?
- Seeking to master a narrowing scope field of high expertise, intending to maximize earning potential in a comparatively/relatively short period of time.

5. Characteristics of the Teacher

What beliefs and values does the teacher have about teaching and learning?

- My learning philosophy: https://xtl-education.online/?page_id=91

- What is his/her attitude toward: the subject? students?

  I am passionate, intentionally immersive, and actively involved on the latest developments, happenings, and current regulatory compliance issues regarding BOPs.

  My attitude is that students taking this course have made a significant financial investment in registering for the course, subsequently they have a vested interested in wanting to learn as much as possible about this subject matter. It is my responsibility to create and facilitate a significant learning environment populated with the critical concepts and through the Socratic approach cognitively enable students to connect the dots in walking away with an authentic learning experience meeting with industry expectations.

- What level of knowledge or familiarity does he has with this subject? What are his strengths in teaching?

  Homer Stewart has more than 30 years of oil and gas experience in downstream and upstream operations with more than 15 years working with subsea well control equipment and systems.

Mr. Stewart, has taught internationally onsite customer locales since 2004, locally in Houston Community College (2005-2009); certified instructor with the Texas Education Agency (TEA, 2005 - present) for purposes of teaching matriculating high school students into the field of oil and gas; successfully worked on and developed curriculum with the TEA for 9 – 12 grade students; and as senior curriculum developer, designed courses for subsea oil and gas personnel for onboarding new personnel into the related field, for which courses are listed as approved for multiple oil and gas operating companies and the federal applicable governing body in the United States.

He has been frequently recognized for his ability to facilitate and meaningfully engage students in discussions of real world case scenarios modeling critical soft skills for students, cognitively connecting the concepts learned crucial for field applications and to function effectively as a team member in a specialized offshore community.