

**17BPE421 - Hydrocarbon Contracts and Asset Management**

| Teaching Scheme |   |   |   |          | Examination Scheme |    |    |           |         |             |
|-----------------|---|---|---|----------|--------------------|----|----|-----------|---------|-------------|
| L               | T | P | C | Hrs/Week | Theory             |    |    | Practical |         | Total Marks |
|                 |   |   |   |          | MS                 | ES | IA | LW        | LE/Viva |             |
| 3               | 0 | 0 | 3 | 3        | 25                 | 50 | 25 | -         | -       | 100         |

**Unit I** **Hours : 9**

Life cycle of Petroleum Project, Fiscal System in hydrocarbon industry (Progressive, regressive fiscal policy tax and non-tax components of Fiscal Policy), Basic elements of Contracts, Basic terminologies of contract and legal. Basics of Upstream and Downstream regulatory Laws and Policies, Fundamentals of Oil and gas accounting: Capex, Opex, Cost classification, Depreciation depletion and amortization (DDA), Cash flow, internal rate of return, Net Present value

**Unit II** **Hours : 12**

Upstream Agreements (Concessionary, Production sharing, Risk sharing,), Indian policy on Hydrocarbon Exploration and Licensing Policy (HELP). Drilling Contracts, Farm-in and Farm-out, Joint ventures, Comingling allocation and attribution agreement, Gas sale and supply agreement. LNG Agreement

**Unit III** **Hours : 8**

Hydrocarbon trading-Oil trading, Physical and Paper; Crude oil Markets- Spot, Barter, Future and forward. Oil pricing mechanism, short term and long term Oil Pricing.

**Unit IV** **Hours : 10**

Asset Integrity Management Introduction to concept of Asset Management & Asset Integrity Management, The Asset Management System – Asset Management Policy – Asset Management Strategy – (Strategic) Asset Management Plans – line of sight; International standard on Asset Management: ISO 55000; Risk & Risk Assessment Approaches Used for Asset Integrity Management; Identification & assessment of risk; Risk management: using the risk matrix, risk register & hazard log; Risk Based Maintenance Deterioration: the way assets could fail the seven steps of Risk Based Maintenance (RBM) / Reliability Centred Maintenance (RCM) incl. Failure Mode Effects & Criticality Analysis; Failure behaviour of onshore & offshore systems.

**Total Hours : 39**

**Texts and References:**

1. Shippey, K. C. (2009) A short course on international Contracts, 4 th Ed. World Trace press.
2. Tordo, S (2007) Fiscal System in Hydrocarbons: design issues. The World Bank
3. Ministry of P & G (Government of India) Model Production Sharing Contracts and HELP,
4. Johnston, D (1994) International petroleum fiscal system and Production sharing contracts, Penn Well books
5. Wright, C. J and Gallum, R. A. (2008) Fundamentals of Oil and Gas accounting 5<sup>th</sup> Edition Pennwell
6. Millar, M. P (2015) Asset Integrity management handbook
7. Jennings Anthony (2002) Oil and Gas Exploration contracts
8. Jennings Anthony (2002) Oil and Gas Production contracts
9. David M. R. (1999) Oil and Gas infrastructure and mid-stream agreement
10. David M. R. (1999) Natural gas Agreement

**17BPE422 - Health, Safety and Environment**

| Teaching Scheme |   |   |   |          | Examination Scheme |    |    |           |         |             |
|-----------------|---|---|---|----------|--------------------|----|----|-----------|---------|-------------|
| L               | T | P | C | Hrs/Week | Theory             |    |    | Practical |         | Total Marks |
|                 |   |   |   |          | MS                 | ES | IA | LW        | LE/Viva |             |
| 3               | 0 | 0 | 3 | 3        | 25                 | 50 | 25 | --        | --      | 100         |

**Unit I** **Hours: 10**  
 Physical Hazards Noise, Heat, Vibration, Illumination, Radiation, extreme climatic conditions etc, Chemical Hazards Hydrogen sulfide gas, Hydrocarbons, Ammonia, Chlorine, Formaldehyde, Hydrochloric Acid, Methanol, Sulphur, Sulphuric acid, Sodium Hydroxide, etc. Biological Hazards, Psychological Hazards, Ergonomic Hazards, Injuries, Burns etc Prevention & Remedial controls of Occupational Hazards In Oil & Gas Industry for each type of Hazards Engineering Control, Administrative Control, Medical Control, Use of Personal Protective Equipment (PPE) Understanding Fire: Fire triangle/tetrahedron, Stages of development of fire Flammability, Concept of flash / Fire point, volatility, Flammable Limits, Fire Detection; Fire signature, Smoke, Heat, Flame, Combustible Gas Detection Fire Prevention, Fire suppression , Process Safety: Safety Analysis Table, Safety Analysis Checklist & SAFE Chart( ref API 14 C)

**Unit II** **Hours: 10**  
**Hazard & Risk Analysis**  
 Risk Matrix, HAZID, HAZOP, QRA (API 14 J, OISD) ,Safe Work Practices :PTW, MOC, SIMOPS etc (ref API RP 75,OISD, OMR) , Electrical Safety;, Classification of Hazardous locations, use of electricity I Hazardous area ( Ref IER, OISD, OMR, API RP 500 & 14 F) Accident Investigations:Study of major accidents like Piper Alpha, Flixborough, Bhopal etc., Investigation techniques Emergency Response planning Audits & Inspection. Audit methodology, protocol, typical check lists for Drilling rigs, Work over activities, logging, etc (ref OISD Standards)

**Unit III** **Hours: 9**  
**HSE Management System**  
 OISD, API RP 75, ISO 14000, ISO 9000, OSHAS 18000 Standards, OMR and Petroleum Rules (by PESO).

**Unit IV** **Hours: 10**  
**Environment**  
**Environment Concepts:** Effect on eco-system; Air, Water, & Soil of HC"s. Impact of Exploration & Exploitation of Hydrocarbon on Environment Environmental studies (Off shore & On Shore) - Environmental Impact Assessment Oil Spills Control and their management. State, Government of India and international Maritime Environmental Rules & Regulations. Drilling / Oil Storage / Effluent water / waste (solid & sludge) treatments their disposal and remediation of soil etc.  
**Upstream safety:** Implementing Agency OISD(for on-land blocks)Directorate of Mine Safety (for Off Shore Blocks), Safety in Rig operation; Safety in Exploration and Production.  
**Downstream Safety:** Implementing Agency PNGRB; Safety Regulations(Technical Standard, Specification and Safety Standards T4S), Emergencies, Mutual Aida; Emergency Response and Disaster Management Plan ERDMP).

**Total Hours: 39**

**Texts and References:**

1. Less, F. P., Loss Prevention in the Process Industries, 2nd ed., Butterworth Heinemann, UK.
2. Peavy, H. S., Rowe, D. R. and Tchobanoglous, G., Environmental Engineering, McGraw Hill, New York.
3. Sanders, R. E., Chemical Process Safety, Butterworth Heinemann, UK, Year.
4. NFPA, API 14 G & OISD Standards.
5. Marchell, V. and Ruchemann, S., Fundamentals of Process Safety, Institution of Chemical Engineers, Warwickshire, UK.

**17BPE423 - Project**

| Teaching Scheme   |    |    |   |          | Examination Scheme |     |       |
|---|----|----|---|----------|--------------------|-----|-------|
| L   | T  | P  | C | Hrs/Week | Report writing     | V/V | Total |
| --  | -- | 12 | 6 | 12       | --                 | --  | --    |
| <p><b>Aim:</b> To address specific industry and research related problems.</p> <p><b>Unit 1:</b> Experimentation and data analysis and Synthesis</p> <p><b>Unit 2:</b> Outcome, discussion and conclusion</p> <p><b>Unit 3:</b> Report Writing, Presentation and Viva-Voce</p>  |    |    |   |          |                    |     |       |
| <p><b>Text Books&amp;RecommendedSoftware:</b></p> <ol style="list-style-type: none"><li>1. Kothari, C. P. (2008) Research Methodology: Methods and techniques,</li><li>2. Murray, R (2002) How to write a thesis, McGrawal Hill Publication</li><li>3. Recent ENDNOTE Software for referencing</li><li>4. JABREF for Referencing.</li></ol> |    |    |   |          |                    |     |       |