

TEACHING PLAN FOR THEORY

Subject Teacher: Mr. O.R.Ukarde

| Subject: 301005: Fluid Mechanics-II Class: TE (A) | | | Branch: Civil | Year 2017-2018 |
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| Lecture No | Scheduled Date | Topics to be covered on the scheduled date | | |
| | | Syllabus Discussion, Discussion on course objective & course outcome | | |
| Unit-1: (08 Hrs) | | | | |
| 1 | 15/6/2017 | Practical problems involving fluid flow around submerged objects | | |
| 2 | 15/6/2017 | Definitions and expressions for drag, lift, drag coefficient, lift coefficient, types of drag. | | |
| 3 | 20/6/2017 | Drag on sphere, cylinder, flat plate and Aerofoil, Karman's vortex street, Effects of free surface and compressibility on drag | | |
| 4 | 21/6/2017 | Development of lifts, Lift on cylinder and Aerofoil, Magnus effect, Polar diagram. | | |
| 5 | 22/6/2017 | Types of unsteady flow; Flow through openings under varying head | | |
| 6 | 22/6/2017 | Fluid compressibility, Celerity of elastic pressure wave through fluid medium; | | |
| 7 | 27/6/2017 | Water hammer phenomenon; Rise of pressure due to water hammer | | |
| 8 | 28/6/2017 | Surge Tanks and their functions. | | |
| Unit II : (08 Hrs) | | | | |

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| 1 | 29/6/2017 | Classification of channels, and Channel flows. Basic governing equations of Channel flow viz. |
| 2 | 29/6/2017 | continuity equation, energy equation and momentum equation, One dimensional approach |
| 3 | 4/7/2017 | Geometric elements of channel, Velocity distribution in open channel flow |
| 4 | 5/7/2017 | Introduction to notches and weirs ((Rectangular, Triangular, Trapezoidal). . |
| 5 | 6/7/2017 | Specific energy, Specific force Specific energy diagram, Specific force diagram, Depth discharge Diagram, |
| 6 | 6/7/2017 | Critical depth, Conditions for occurrence of critical flow; Froude's number, . |
| 7 | 11/6/2017 | Flow classification based on it, Important terms pertaining to critical flow viz. section factor |
| 8 | 12/6/2017 | concept of first hydraulic exponent; Critical flow computations; channel transitions |
| Unit-III: (08 Hrs) | | |
| 1 | 13/7/2017 | Characteristics and establishment of uniform flow, uniform flow formulae :Chezy's and Manning's formulae; |
| 2 | 13/7/2017 | Factors affecting Manning's roughness coefficient; Important terms pertaining to uniform flow |
| 3 | 18/7/2017 | viz. normal depth, conveyance, section factor, concept of second hydraulic exponent, |
| 4 | 19/7/2017 | Uniform flow computations. Most efficient channel sections (rectangular, triangular, trapezoidal and circular) |
| 5 | 20/7/2017 | Phenomenon of hydraulic jump; Location and examples of occurrence of hydraulic jump; Assumptions in the theory of hydraulic jump |

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| 6 | 20/7/2017 | Application of momentum equation to hydraulic jump in rectangular channel: Conjugate depths and relations between conjugate depths |
| 7 | 25/7/2017 | Energy dissipation in hydraulic jump; Graphical method of determination of energy dissipation, |
| 8 | 26/7/2017 | Classification of hydraulic jump; Practical uses of hydraulic jump, venture flume, standing wave flume |

UNIT IV: (08 Hrs)

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| 1 | 27/7/2017 | Force and work done due to impact of jet on stationary and moving |
| 2 | 27/7/2017 | flat and curved surfaces using linear momentum principle. |
| 3 | 1/8/2017 | : General classification of pumps, Centrifugal pumps- Classification, |
| 4 | 2/8/2017 | , theory working, Selection of pumps, |
| 5 | 3/8/2017 | Centrifugal head, Work done by impeller, Heads and efficiencies, |
| 6 | 3/8/2017 | minimum starting speed, Cavitation in centrifugal pumps |
| 7 | 8/8/2017 | multistage pumping, Introduction to submersible pumps |
| 8 | 9/8/2017 | reciprocating pumps,, |

Unit V : (08 Hrs)

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| 1 | 10/8/2017 | Elements of hydropower plant; hydraulic turbines- Classification, heads and efficiencies |
| 2 | 16/8/2017 | Design and governing of Pelton Wheel |
| 3 | 22/8/2017 | , Francis turbine-parts and working. |
| 4 | 23/8/2017 | Cavitation in hydraulic turbines- |
| 5 | 24/8/2017 | Prediction of performance in terms of unit quantities |
| 6 | 24/8/2017 | specific quantities, Specific speed, Characteristic curves |
| 7 | 29/8/2017 | Dimensional analysis as applied to hydraulic turbines |
| 8 | 30/8/2017 | selection of turbines |
| UNIT VI: (08 Hrs) | | |
| 1 | 31/8/2017 | Definition and types of non-uniform flow; Gradually Varied Flow (GVF) and Rapidly Varied Flow (RVF) |
| 2 | 5/9/2017 | Basic Assumptions of GVF; Differential equation of GVF - |
| 3 | 6/9/2017 | Alternative forms; Classification of channel bed slopes |
| 4 | 7/9/2017 | Various GVF profiles, their general characteristics and examples of their occurrence; Control section |
| 5 | 7/9/2017 | Methods of GVF computations |
| 6 | 12/9/2017 | Direct Step method, Graphical Integration method |

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| 7 | 13/9/2017 | Standard Step method, |
| 8 | 14/9/2017 | VenTe Chow method |