Indian Institute of Technology
Course Details Report

Course No: OE5560
Course Name: Dredging and reclamation

Course Type:
Theory

Description:
To introduce dredging methods, equipment, principles and reclamation of artificial land using dredged materials.

Course Content:
Introduction to Dredging and dredging equipment; Need for reclamation; Introduction to Engineering aspects of Dredging and Reclamation.

Marine investigations for Dredging and Reclamation – Standards, Requirements and Methods: Hydrographic survey; Geophysical – sidescan, sub-bottom, seabed refraction investigations; Geotechnical investigations; Sea bed and water sample analysis. Use of Marine investigations in Capital and Maintenance Dredging, and reclamation.

Characterization of Soils and Rocks; PIANC guidelines (Report No. WG 144) and other international practices; Interpretation of marine investigation data in the context of characterization of soils for dredging. Methods of estimation of Dredging Production; Estimation cutter power. Dredging equipment selection; cutting tools and power estimation; pumps and capacity; dredging tolerances and dredging methods in river, open sea and inland water bodies; dredging near existing structures; Dredge spoil disposal; spoil dumping ground selection; methods of transportation of dredged spoil.

Reclamation schemes; Burrow pit materials from land; dyke formation and peripheral shore protection; near shore and island reclamation; use of dredged materials for reclamation; direct dumping methods; rainbow discharge; pumping via pipelines; booster stations; layered soil dumping; suitability of materials for reclamation; Methods of ground improvement in reclamation; vibro-compaction etc.

Estimation of cost; rate analysis for dredging; Cost standards (CIRIA C684); Dredging management to protect the environment; risks and cost escalation in dredging; siltation issues; dispersion of silt; silt curtains and containment booms.

Text Books:

1. Vlasblom, WJ. 2007. Dredging equipment and technology, University lecture notes, Delft University of Technology, Delft, The Netherlands.
2. Sape A Miedema. 2019. The Delft Sand, Clay and Rock, Cutting Model, TU Delft Open, ISBN: 978-946-3661-324
3. Bray, N and COHEN, M (Ed.). 2010. Dredging for development, Sixth Ed., Int. Association of Dredging Companies, The Netherlands and Int. Association of Ports and Harbors, Japan, ISBN: 978-9-07525-416-7
4. Bray, RN., Bates, AD and Land, JM. 1996. Dredging: A Handbook for Engineers, Butterworth Heinemann, London, UK, ISBN: 978-0-34054-524-9
5. Vallam Sundar and Sannasiraj, SA. 2019. Coastal Engineering: Theory and Practice, Adv series on Coastal engineering, Vol. 47, World Scientific, Singapore, ISBN: 978-981-3275-90-4

Reference Books:

1. IADC. 2018. Dredging for sustainable infrastructure, Int. Association of Dredging companies, The Netherlands.
2. Offshore Shipping Online, 2009. Dredgers of the world, 7th Ed., Offshore Energy Newsletter, The Netherlands.
3. Bray, RN. 2009. A guide to cost standards of dredging equipment C684, Construction Industry Research and Information Association (CIRIA), ISBN: 978-0-86017-684-8