NIRMA UNIVERSITY

Institute:	School of Engineering, Institute of Technology	
Name of Programme:	M. Tech. in Civil Engineering	
_	(Construction Technology and Management)	
Course Code:	6CL251	
Course Title:	Equipment & Material Management	
Course Type:	[(☑ Core/□Value Added Course/ □Departmental Elective/	
	Institute Elective/	
	Elective Any other)	
Year of introduction:	2022-23	

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Course Learning Outcomes (CLOs):

At the end of the course, the students will be able to -

1.	choose the most appropriate plants and equipment for construction projects	(BL5)
2.	plan and manage the use of equipment for construction activities	(BL3)
3.	examine various aspects of material management	(BL4)
4.	identify scientific methods of inventory management.	(BL3)

Syllabus:

Teaching hours: 45

Unit	Syllabus	Teaching hours
Unit-I	Construction Equipment	12
	Need of equipment, advantages and disadvantages, classification,	
	study of construction operations as dynamic production processes.	
	Utilization of equipment and other resources to achieve highest levels	
	of productivity, safety, and quality. Earth Moving equipment,	
	Excavating equipment, hauling equipment, Compacting Equipment,	
	Finishing equipment, Equipment for Dredging, Trenching, Drag line	
	and clamshells, Tunnelling Equipment for Drilling and Blasting, Pile	
	driving Equipment, Erection Equipment, Types of pumps used in	
	Construction, Equipment for Dewatering and Grouting, Equipment	

Unit-II Management of Equipment

for Demolition, Asphalt and Concrete Plants.

Need of equipment management, Engineering fundamental of equipment, planning and selection of equipment, factors affecting selection of equipment, forecasting equipment, extent of mechanisation, procurement, purchase and import procedures, installation, Economics of equipment - owning & operating cost of equipment, time value of money concept, economic life of equipment, decision on buy, rent, lease. Maintenance and repair of the equipment – objectives, planning and phases of maintenance, maintenance workshop, breakdown maintenance, preventive maintenance, spare

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part management, repair record of maintenance and repair, Replacement of Equipment, Replacement analysis, Safety and insurance at site.

Unit-III Introduction to Materials Management

Material management concept, definition, importance, advantages of material management, supply chain management concept, integrated approach for material management, role of materials manager, Functions of material management - material requirement planning, procurement, identification of sources of procurement, vendor analysis, purchase procedure, material specification, Quality Control - Conventional methods of quality control of Construction materials, Statistical method of quality control, sampling techniques quality control in process, quality management and its economics, material custody, safety measures, material accounting, transportation, Classification and Codification of materials, Standardization in materials and their management, disposal, waster & scrap control, recycling, use of Materials Management Systems (MMS) in materials planning, procurement, inventory, control, cost control etc. Application of software in Material Management, material management policy.

Unit-IV Inventory Management

Inventory Control basics, objective, transaction motive, organising inventory, concept of operating cycle, Economic Order Quantity (EOQ), Advantages and limitation of use of EOQ, Periodic ordering, order point control, safety stock, reserve stock, stock outs, periodic review system, application of AC analysis in inventory control, concept of Just in time management (JIT), Indices used for assessment of effectiveness of inventory management. Stores Management: Receipt and inspection, care and safety in handling, loss on storage, wastage, Bulk purchasing, site layout and site organization, scheduling of men, materials and equipment.

Self Study:	The self-study contents will be declared at the commencement of semester. Around 10% of the questions will be asked from self-study contents.
Suggested Readings/ References:	 Gopalakrishnan P., Sundaresan M., Materials Management: An Integrated Approach, PHI. Sharma, S.C., Construction Equipments and its Management, Khanna publishers. Robert Peurifoy, Clifford J. Schexnayder, Aviad Shapira, Construction Planning, Equipment and Methods, McGraw Hill Education. Schaufelberger J. and Migliaccio, G. C., Construction Equipment Management, Routledge. J. Singh, Heavy Construction-Planning, equipment and methods, Oxford & IBH Publishing.

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- Kumar S.S., *Construction Management and Equipment*, S.K.Kataria & Sons Publishing.
- Gransberg, D. D., Popescu, C. M., Ryan, R.. Construction equipment management for engineers, estimators, and owners. CRC Press.

Suggested List of Experiments: -

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Suggested Case List: