RAMDEOBABA UNIVERSITY,

NAGPUR

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RAMDEOBABA UNIVERSITY, NAGPUR

Formerly Shri Ramdobaba College of Engineering & Management (RCOEM) Est. 1984

Multidisciplinary Minor [MDM]

2025-2026

Civil Engineering Department

(SchoolofEngineering and Science)

MDM (Multi-Disciplinary Minor) courses Scheme

Track:Civil Engineering for Sustainable Development

Sr. No.	Sem	Course Code	Course Title	Hours/week			Credits	Maximum marks			ESE Duration (Hrs)
				L	T	P		Continuous Evalu	End Sem Exam	Total	
1	III	24ES01TH0305	Fundamentals of Civil Infrastructure and Construction	3	0	0	3	50	50	100	3
2	IV	24ES01TH0404	Construction Materials and Technology	3	0	0	3	50	50	100	3
3	V	24ES01TH0506	Green Building Construction and Environmental Systems	3	0	0	3	50	50	100	3
4	VI	24ES01TH0607	Building Construction Methods and Management	3	0	0	3	50	50	100	3
			TOTAL	**12**	**0**	**0**	**12**				

Ramdeobaba University, Nagpur
Department of Civil Engineering
Syllabus for Semester B.Tech III

Course Code: 24ES01TH0305
Course Name: Fundamentals of Civil Infrastructure and Construction
L :3 Hrs., T: hr P :0 Hrs., Per Week 3 Credits: 3

Courses Outcome

Understanding Civil Infrastructure:This course focuses on explaining the fundamental elements of infrastructure such as roads, bridges, buildings, dams, and utilities, and their roles in society.

Module-I

Importance of Civil engineering in infrastructure development of the country.
Introduction to types of buildings as per NBC, Selection of site for buildings, Components of a residential building and their functions, Introduction to Industrial buildings and types. Building Planning – Basic requirements, elements, introduction to various building area terms, computation of plinth area, carpet area.

Module-II

Building Construction – Foundations, Classification, Bearing Capacity of Soil and related terms (definition only), Masonry Works – classifications, definition of different technical terms, Brick masonry – types, bonds, general principle, Roofs – functional requirements, basic technical terms, roof covering material, Floors – function, types, flooring materials (brief discussion), Plastering and Painting – objectives, types, preparation and procedure of application.Finishing, Services and Special constructions
Wall Finishes: Plastering, pointing, distempering and painting: Purpose, methods, defects and theirsolutions. Vertical communication: Stairs: Terminology, requirements of good staircase,

Module-III

Other Infrastructure – Introduction to highway, types of highways, various other modes of transportation.

Module-IV

Water Supply Engineering – Introduction, different types ofhydraulic structures, dam and weirs, types of dam, purpose and functions.

Text Books:
1. Basic Civil engineering, Gopi, S., Pearson Publication
2. Basic Civil Engineering, Bhavikatti, S. S., New Age.
Reference Books:
3. Construction Technology, Chudley, R., Longman Group, England
4. Basic Civil and Environmental Engineering, C.P. Kausik, New Age.
5. American Society of Civil Engineers (2011) ASCE Code of Ethics – Principles Study and Application.

Ramdeobaba University, Nagpur
Department of Civil Engineering
Syllabus for Semester B.Tech IV

Course Code:24ES01TH0404
Course Name: Construction Materials and Technology
L :3 Hrs., T: hr P :0 Hrs., Per Week 3 Credits: 3

Courses Outcome

Construction materials and technology: Understanding construction materials and technology for civil engineers to design, construct, and maintain infrastructure that meets quality, safety, and sustainability requirements.

Module-I

Basic Building Materials I

Aggregate: Classification, Physical and mechanical properties,

Bricks and Masonry Blocks: Types, properties and field and laboratory tests to evaluate quality Lime: classification, properties Cement: types, Portland cement:

fly ash: properties and use in manufacturing of bricks and cement.

Module-II

Mortar: Types and tests on mortars.

Concrete: Production, mix proportions and grades of concrete,

fresh, mechanical and durability properties of concrete, factors affecting properties of concrete, tests on concrete,

Module-III

Basic Building Materials II

Building stone: classifications, properties and structural requirements; Wood and Wood products: introduction to wood products- veneers, plywoods,
Metals: Steel: Important properties and uses of Iron (Cast iron, wroght iron and steel), Important tests on steel rebar,
Glass: types and uses,
Module-IV [other Materials]

paint: types, distemper, varnish, Adhesive: Types, Bitumen: types, properties and tests.

Reference Books:
1. A Text-Book of Building Construction, S.P.Bindra and S.P.Arora, Dhanpat Rai Publications
2. Building Materials and Construction, Jena and Sahu, Mc. Graw Hill.
3. Materials for Civil and Construction Engineers, Mamlouk and Zaniewski, Pearson
4. Building Materials and Building Construction, by P C Verghese
5. Building Construction, by B. C. Punmia, , Laxmi Publicaton

Ramdeobaba University, Nagpur

Department of Civil Engineering

Syllabus for Semester B.Tech V

Course Code: 24ES01TH0506
Course Name: Green Building Construction and Environmental Systems
L :3 Hrs., T: hr P :0 Hrs., Per Week 3 Credits: 3

Courses Outcome

Green Building construction, green building principles entails using environmentally friendly materials, optimizing energy efficiency, implementing renewable energy systems, and managing water resources efficiently.

Module-I

Solar energy fundamentals & practices in building design- solar astronomical relations and radiation physics and measurements. Elements of design of energy efficient building, Climate responsive process of design, Climate responsive process of design. Sun Path Diagram

Module-II (HVAC)

Heating and ventilation design: Human thermal comfort, climatological factors, material specifications and heat transfer principles Heat loss from buildings, design of insulators.

Thermal performance evaluation for energy efficient materials. Advances in construction components pertaining to thermal comfort in building. Various wall treatments to the existing structures. Passive cooling features.

Module-III

Energy efficient lighting system design: Basic terminologies and standards, Day lighting and artificial lighting design, auditing. Design of artificial ventilation system. Natural lightening systems types.

Module-IV

Renewable energy sources: Solar and wind. Simple design calculations. Advances in computational energy conservation- implementation of computer energy simulation programs into building designs. e.g. TRNSYS, Design Builder etc. 195 Building Code
Norms of Energy Conservation Building code. Introduction to Green Rating Systems. Its factors. Any Case study for green certified building.

Text Books 1.

1. Ministry of Power, Energy Conservation Building Code 2018, Revised Version, Bureau of Energy Efficiency, 2018, https://beeindia.gov.in/ news-events/energy-conservation-building-code-rules2018
2. Handbook of functional requirement of buildings, SP: 41:1987.

3. Indian Building Congress, Practical Handbook on Energy Conservation in Buildings, 1 st ed. Nabhi Publication, 2008.
4. Energy and the Environment JM Fowler, McGraw Hill, New York, 2nd Ed 1984

Reference Books

Mr.vinod B R & Mrs.shobha R, Building Construction Methods and Management.

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Department of Civil Engineering
Syllabus for Semester B.Tech VI

Course Code: 24ES01TH0607
Course Name: Building Construction Methods and Management
L :3 Hrs., T: hr P :0 Hrs., Per Week 3 Credits: 3

Courses Outcome

Construction Engineering &Processes: Construction Engineering & Processes involves efficient project planning, sanctioning execution, and management to deliver structures that meet quality standards within budget and time constraints.

Module-I

Specifications building accessories like plumbing, flooring & roofing materials etc in buildings.

Module-II

Types of steel section/steel pipes used in building, Methods of approximate estimate of buildings.

Module-III

Contract, Types of contracts, Tender notice, EMD, SD, Techno commercial condition of Contract.

Module-IV

Construction projects: their methods of execution; role of client and contractor.Construction Planning, Project planning.CPM,PERT and Line of Balancing Techniques

Text Books:

1.B. N. Dutta , Estimating and costing ,Publisher S. Dutta & company lucknow, Feb 1999 edition. UBS publisher distributors Ltd, 5, Ansari road ,Newelhi.
2.S. P. Chandola&V.N.Vazirani, Estimating and costing , Edition 2010 and latest , khanna Publishers, 2-B, Nath market, Naisarak,elhi.
3. S.C. Rangwala Estimating Costing and valuation , edition 2011, Charotar publishing house, opposite Amul dairy, Court roadAnand
4. F. Hall, Roger Greeno, Building Services Handbook: Incorporating Current Building and Construction Regulations.