NICMAR UNIVERSITY PUNE

SCHOOL OF ENGINEERING

Post Graduate Diploma in Ready–Mix Concrete Management (PGD RMCM)







NICMAR University, Pune

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POST GRADUATE DIPLOMA IN READY-MIX CONCRETE (PGD RMC)

Programme Brochure

(2026-27)

Post Graduate Diploma in Ready- Mix Concrete Management

(PGD RMCM)

INTRODUCTION:

Ready-Mix Concrete (RMC) technology is rapidly emerging as a key driver in the construction industry, propelled by urbanization, infrastructure development, and the rising demand for high-quality, durable building materials. NICMAR University, a leader in construction management education, is well-positioned to introduce a specialized Postgraduate Diploma (PGD) in RMC Technology. This program is designed to meet the industry's growing need for skilled professionals in RMC production, quality control, and sustainable concrete practices.

Industry Growth & Demand: The Indian RMC market is projected to grow at a compound annual growth rate (CAGR) of 8% from 2023 to 2027, driven by the following factors:

- The government's increased focus on infrastructure projects, including smart cities, highways, and affordable housing schemes.
- Growing preference for high-quality, durable construction materials to enhance project efficiency and reduce labor-intensive processes.
- The urbanization boom and increasing environmental concerns led to adopting sustainable building practices.
- By 2024, India is estimated to have approximately 2,500 RMC plants, primarily concentrated in urban and semi-urban regions, where construction activity is at its peak.

This program by NICMAR University aims to equip professionals with the expertise to address these industry trends and challenges effectively.

VISION OF SCHOOL OF ENGINEERING

To emerge as a globally recognized school for promoting innovation and sustainability, equipping students with the knowledge and skills to tackle complex modern-day challenges and transforming them into holistic professionals and responsible citizens.

Mission OF SCHOOL OF ENGINEERING

We at the School of Engineering are committed to achieving the vision by,

M1 Provide transformative education by blending academic excellence with hands-on experience

M2 Promote a culture of interdisciplinary research, Industry Interaction, sustainability, quality and ethical values.

M3 Aim to nurture creative thinking in entrepreneurial and intrapreneurial endeavors.

M4 Prepare industry-ready professionals by enhancing industry-institute interactions.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs):

The proposed PGD in Ready-Mix Concrete Technology aims to:

PEO1: Provide in-depth theoretical and practical knowledge of RMC technology.
PEO2: Develop management and leadership skills for effective plant operations and project execution.
PEO3: Enhance student employability in the RMC industry by integrating industry exposure, internships, and project work.
PEO4: Promote sustainability and innovation in concrete technology.

Students shall be employable in the RMC Sector as RMC Plant Managers, Production Engineers, Quality Control Engineers, Project Managers for Infrastructure Projects, and Sustainability and Environmental Specialists in Concrete Production.

Students shall acquire the skill sets of expertise in concrete mix design and plant operations, proficiency in quality assurance and safety protocols, ability to implement sustainable production practices, and leadership in managing teams and projects.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO1: Able to write and present a substantial technical report/ document, enabling them to interact with the stakeholders of RMC projects.

PSO2: Apply the theory and practices of operation, maintenance, managing resources and execution of the RMC plant.

PSO3: Apply digital technologies for operation, maintenance, managing resources and execution of the RMC plant.

PSO4: Demonstrate professionalism, ethical approach, and interpersonal skills to work in multidisciplinary project teams

PSO5: Develop proficiency in Project Communications and Financial skills for business conduct.

DURATION

The programme duration is of one year and is organised into two semesters. The internship is embedded in the second semester.

ELIGIBILITY

Candidates with a regular bachelor's degree in civil engineering or related field from a recognized institution/university are eligible. Candidates seeking admission are required to have secured a minimum of 50% aggregate marks (45% for the candidates from the reserved category) at the graduation level. Final year eligible graduating students can also apply. However, such candidates must have completed (passed) their Graduation before the commencement of programme.

ADMISSION PROCEDURE

Selection of students is made by the selection committee. Those interested in admission to the programmes offered by NICMAR University, Pune may apply online, pay fees and upload documents through our website. All specified documents must be submitted. Incomplete applications will not be considered.

TABLE 1: PGD RMC Program Structure

Course		L	T	P	Credits
Semester 1					
1	Advances in Concrete Technology	2	0	0	2
2	Concrete Materials and Properties	1	1	0	2
3	RMC Plant and Machineries	1	1	0	2
4	Quality and Safety Management	2	0	0	2
5	Business Communication	0	0	1	1
6	Product Marketing and Strategies	1	0	0	1
7	Material Testing and Concrete Mix Design	0	0	1	1
8	Fundamentals of Mechanical & Electrical Systems	2	0	0	2
9	Human Resource Management	1	0	0	1
10	Project Work	0	0	6	6
Semester-1 Total		**10**	**2**	**8**	**20**
Semester 2					
1	Accounting and Cost Management	1	1	0	2
2	Sustainable Practices in RMC Production	2	0	0	2
3	Planning and Execution for RMC Applications	2	0	0	2
4	Production and Operation Management	2	0	0	2
5	IT Applications	1	0	1	2
6	Internship (Work-based learning)	0	0	12	12
Semester -2 Total		**8**	**1**	**13**	**22**
Total Credits		**18**	**4**	**22**	**42**

Note: Semester -2: Three-day Internship at the site and two-day classroom teaching/ or online sessions is offered to the students.

Semester 1 Courses

Advances in Concrete Technology (2 credits)

Objective: This course aims to introduce students to state-of-the-art innovations and modern advancements in concrete technology to enhance the performance, durability, and sustainability of concrete structures.

Syllabus Content: Topics include high-performance concrete (HPC), ultra-high-performance concrete (UHPC), self-compacting concrete (SCC), self-healing concrete, and nanotechnology applications in concrete. It also covers advanced admixtures, fiber-reinforced concrete, and modern curing methods. Students will learn to apply these technologies to practical challenges in construction and infrastructure projects.

Concrete Materials and Properties (2 credits)

Objective: To develop a deep understanding of the materials used in concrete and their influence on concrete's mechanical, physical, and chemical properties.

Syllabus Content: This course covers the types of cements, aggregates, and supplementary cementitious materials (SCMs) like GGBS, fly ash, and silica fume. Rheology and workability, setting time, and strength development of concrete are explored in detail, along with an emphasis on durability factors like permeability, corrosion resistance, and sulfate attack.

RMC Plant and Machineries (2 credits)

Objective: To equip students with knowledge of plant operations, machinery, and technology used in ready-mix concrete production.

Syllabus Content: This course examines batching plants, their components, automation systems, and the technology used for material handling and storage. Topics include weigh batching, conveyors, mixers, concrete transportation systems, and maintenance schedules to ensure efficient plant operation.

Quality and Safety Management (2 credits)

Objective: To instill the importance of quality control and safety practices in RMC production and ensure compliance with industry standards.

Syllabus Content: Topics include statistical quality control methods, on-site testing procedures, and ISO standards for quality and safety. Risk assessment, hazard identification, and mitigation strategies are emphasized, alongside case studies of safety incidents and lessons learned.

Business Communication (1 credit)

Objective: Develop effective communication skills for professionals working in the RMC industry, focusing on business and interpersonal communication.

Syllabus Content: The course includes professional writing (emails, reports, proposals), verbal communication techniques, presentation skills, conflict resolution, and negotiation strategies tailored to business scenarios.

Product Marketing and Strategies (1 credit)

Objective: Introduce marketing principles and strategies to position RMC products effectively in competitive markets.

Syllabus Content: This course covers fundamentals of marketing, customer segmentation, branding, and creating competitive strategies. Students will learn pricing models, market research methods, and developing promotional campaigns specific to RMC products.

Material Testing and Concrete Mix Design (1 credit)

Objective: Provide hands-on experience in testing materials and designing concrete mixes to meet specific performance requirements.

Syllabus Content: Laboratory testing of aggregates, cement, and fresh concrete properties. Principles of mix design (IS, ACI, and BS methods), trial batching, and optimization techniques for strength, durability, and workability are explored.

Fundamentals of Mechanical & Electrical Systems (2 credits)

Objective: Impart basic knowledge of mechanical and electrical systems used in RMC plant operations to ensure smooth functioning and maintenance.

Syllabus Content: This course covers the working principles of pumps, motors, compressors, and conveyors. It includes electrical control systems, circuits, and troubleshooting techniques for machinery commonly used in RMC production.

Human Resource Management (1 credit)

Objective: To develop an understanding of managing human resources effectively in the RMC industry to optimize productivity and workplace harmony.

Syllabus Content: Workforce planning, recruitment, and retention strategies are covered, along with training, performance appraisal systems, and leadership development. It also includes insights into conflict resolution and team-building exercises.

Project Work (6 credits)

Objective: Allow students to apply their knowledge to real-world problems and projects related to the RMC industry.

Syllabus Content: Students identify industry challenges, conduct research, analyze data, and develop innovative solutions. They prepare detailed project reports and present findings, simulating real-life professional scenarios.

Semester 2 Courses

Accounting and Cost Management (2 credits)

Objective: Introduce students to financial and cost management concepts essential for efficient RMC operations.

Syllabus Content: Topics include the basics of accounting principles, cost analysis, budget preparation, cost control measures, and profitability optimization. Real-life case studies help students relate theoretical knowledge to practical financial decision-making in RMC operations.

Sustainable Practices in RMC Production (2 credits)

Objective: To educate students on eco-friendly and sustainable practices in RMC production to minimize environmental impact.

Syllabus Content: Recycling concrete waste, using industrial by-products, energy-efficient processes, and reducing carbon footprints are explored. The course emphasizes regulatory frameworks and green certifications like IGBC or LEED.

Planning and Execution for RMC Applications (2 credits)

Objective: Teach students the skills required to plan, execute, and manage RMC applications in construction projects efficiently.

Syllabus Content: Topics include project scheduling, logistics, resource allocation, and on-site quality assurance. Case studies of successful RMC applications and common challenges in execution are discussed.

Production and Operation Management (2 credits)

Objective: Equip students with skills to manage production and operational processes in RMC plants effectively.

Syllabus Content: Production planning, lean manufacturing, workflow optimization, and process improvement are included. The course highlights the role of technology and analytics in optimizing operations.

IT Applications (2 credits)

Objective: Familiarize students with the use of IT tools and software for streamlining RMC operations and project management.

Syllabus Content: Topics include ERP systems, inventory management software, data analytics for production monitoring, and tools for scheduling and reporting. The practical component involves working with industry-standard IT tools.

Internship (Work-Based Learning) (12 credits)

Objective: Provide real-world exposure to RMC operations, enhancing students' practical knowledge and industry readiness.

Syllabus Content: Students undergo internships at RMC plants, gaining insights into daily operations, problem-solving, and quality assurance. They are required to document their learning and present an internship report summarizing their experience.