

VISION OF THE DEPARTMENT

The Department will be an internationally recognized centre for value based learning, research and consultancy in Civil Engineering and will produce competent Civil Engineers having commitment to national development.

MISSION OF THE DEPARTMENT

1. To impart high quality Civil Engineering education through competent faculty, modern labs and facilities.
2. To engage in R & D activities and to provide state-of-the-art consultancy services addressing Civil Engineering challenges of the society.
3. To nurture social purpose in Civil Engineers through collaborations.

PROGRAMME EDUCATIONAL OBJECTIVES

Civil Engineering graduates are expected to attain the following program educational objectives (PEOs) 3-5 years after Post-Graduation. Our Postgraduate will be professionals who will be able to:

PEO1: Deliver competent services in the field of Water Resources Engineering, and contribute to knowledge transfer;

PEO2: Contribute to enhancement of knowledge through innovative practices and research;

PEO3: Possess a flair for lifelong learning; contribute to technological advancement and sustainable development of the society.

PROGRAMME SPECIFIC OUTCOMES

Graduates of the Programme will have:

PSO1: Fundamental and contemporary knowledge necessary to analyze problems associated with water resources;

PSO2: Ability to think originally, and to conceptualize and provide potential solutions to problems in the context of global, societal and cultural domains;

PSO3: Flair for research and development in the global scenario, with the ability to present and communicate technical findings.

GRADUATE ATTRIBUTES

1. **Scholarship of knowledge**

Acquire in depth knowledge of specific discipline or professional area, including wider and global perspective, with an ability to discriminate, evaluate, analyse and synthesize existing and new knowledge and integration of the same for enhancement of knowledge.

2. **Critical thinking**

Analyze complex engineering problems critically; apply independent judgment for synthesizing information to make intellectual and/or creative advances for conducting research in a wider theoretical, practical and policy context.

3. **Problem solving**

Think laterally and originally, conceptualize and solve engineering problems, evaluate a wide range of potential solutions for those problems and arrive at feasible, optimal solutions after considering public health and safety, cultural, societal and environmental factors in the core areas of expertise.

4. **Research skill**

Extract information pertinent to unfamiliar problems through literature survey and experiments, apply appropriate research methodologies, techniques and tools, design, conduct experiments, analyze and interpret data, demonstrate higher order skill and view things in a broader perspective, contribute individually/in group to the development of scientific/technological knowledge in one or more domains of engineering.

5. **Usage of modern tools**

Create, select, learn and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **Collaborative and multidisciplinary work**

Possess knowledge and understanding of group dynamic, recognize opportunities and contribute positively to collaborative- multidisciplinary scientific research, demonstrate a capacity for self-management and teamwork, decision making based on open-mindedness, objectivity and rational analysis in order to achieve common goals and further the learning of themselves as well as others.

7. **Project management and finance**

Demonstrate knowledge and understanding of engineering and management principles and apply the same to one's own work, as a member and leader in a team, manage projects efficiently in respective disciplines and multidisciplinary environments after consideration of economical; and financial factors.

8. **Communication**

Communicate with the engineering community, and with society at large, regarding complex engineering activities confidently and effectively such as, being able to comprehend and write effective reports and design documentation by adhering to appropriate standards, make effective presentations, and give and receive clear instructions.

9. **Life-long learning**

Recognize the need for, and have the preparation and ability to engage in life-long learning independently, with a high level of enthusiasm and commitment to improve knowledge and competence continuously.

10. **Ethical practices and social responsibility**

Acquire professional and intellectual integrity, professional code of conduct, ethics of research and scholarship, consideration of the impact of research outcomes on professional practices and an understanding of responsibility to contribute to the community for sustainable development of society.

11. Independent and reflective learning

Observe and examine critically the outcomes of one's actions and make corrective measures subsequently, and learn from mistakes without depending on external feedback.

PROGRAMME OUTCOMES

The M.Tech. (Hydraulics Engineering) graduates from the Department will have:

- PO1:** An ability to independently carry out research/ investigation and development work to solve practical problems in the field of Hydraulics Engineering
- PO2:** An ability to write and present a substantial technical report/document
- PO3:** Students should be able to demonstrate a degree of mastery in the field of Hydraulics Engineering
- PO4:** An ability to use the modern tools to model and design Hydraulic and Hydrological Engineering systems.
- PO5:** An ability to apply the principles of engineering, management and finance to execute/ implement/ accomplish water resources and multidisciplinary projects in the context of rapid technological advances.

SUGGESTED PLAN OF STUDY

Semester →	I	II	III	IV
Sl. No				
1	AEM1C01	MHY2C01	MHY3MOXX	MHY4C01
2	MHY1C01	MHY2C02	MHY3MXX	-
3	MHY1C02	MHY2C03	MHY3C02	-
4	MHY1C03	MHY2C04	MHY3C03	-
5	MHY1E1XX	MHY2E3XX	MHY3C04	-
6	MHY1E2XX	MHY2E4XX	-	-
7	MHY1CRM	MHY2IXX	-	-
8	MHY1L01	MHY2L01	-	-
Total Credits	27	27	19	15

TABLE OF TOTAL CREDITS TO BE EARNED BY A STUDENT**Degree Requirements:**

Category of courses	Minimum credits to be earned by regular students
Core Courses	38
Credits for Departmental Elective	12
Credits for Industry Driven Elective	2
Credits for Open Elective	2
Credits for Research Methodology	2
Credits for Engg. Management, Engg. Economics, Financial Management & Ethics	3
Credits for Seminar/Paper presentation	1
Credits for Internship	5
Credits for Project	23
Total Credits	88

LIST OF COURSES OFFERED AS PER CATEGORY

Core -Theory

AEM1C01 Applied Engineering Mathematics	(4-0-0) 4
MHY1C01 Surface Water Hydrology	(4-2-0) 5
MHY1C02 Free Surface flow	(4-2-0) 5
MHY1C03 Ideal Fluid Flow	(3-2-0) 4
MHY1CRM Research Methodology	(2-0-0) 2
MHY2C01 Hydrological Modeling	(4-2-0) 5
MHY2C02 Hydro Power Engineering	(4-0-0) 4
MHY2C03 Ground Water Engineering	(4-2-0) 5
MHY2C04 Real Fluid Flow	(3-2-0) 4

Core -Lab

MHY1L01 Hydraulics and Hydrologic Engineering Laboratory	(0-0-2) 1
MHY2L01 Hydro Systems Computational Laboratory	(0-0-2) 1

Electives

MHY1E1XX Department Elective-1	(3-0-0) 3
MHY1E2XX Department Elective-2	(3-0-0) 3
MHY2E3XX Department Elective-3	(3-0-0) 3
MHY2E4XX Department Elective-4	(3-0-0) 3
MHY2IXX Industry Driven Elective	(2-0-0) 2
MHY3MOXX Open Elective	(2-0-0) 2
MHY3MXX Engineering Management	(3-0-0) 3

Project, Seminar etc.,

MHY3C02 Seminar/Paper Presentation	(0-0-0) 1
MHY3C03 Internship	(0-0-0) 5
MHY3C04 Project Phase-1	(0-0-0) 8
MHY4C01 Project Phase-2	(0-0-0) 15

Course Numbering Scheme

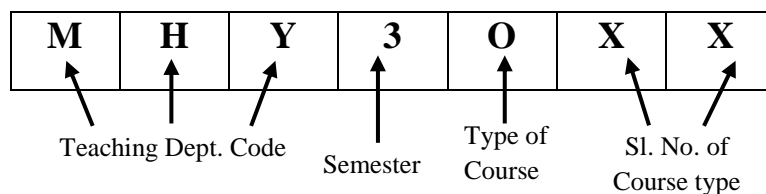
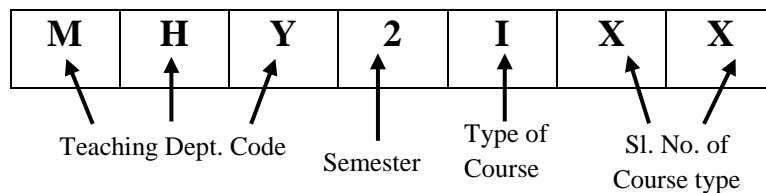
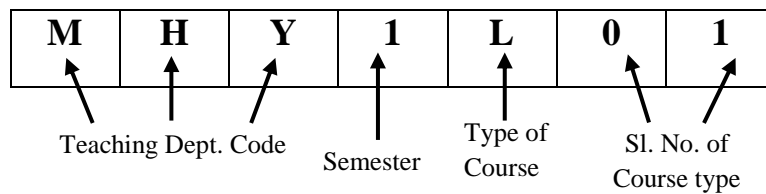
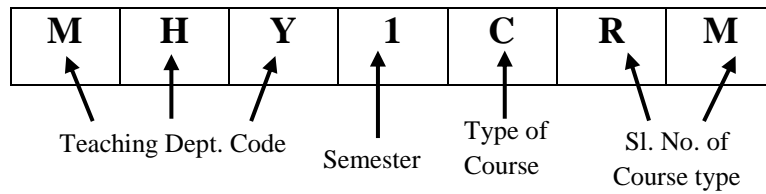
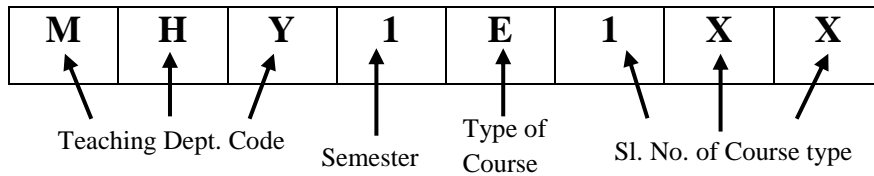
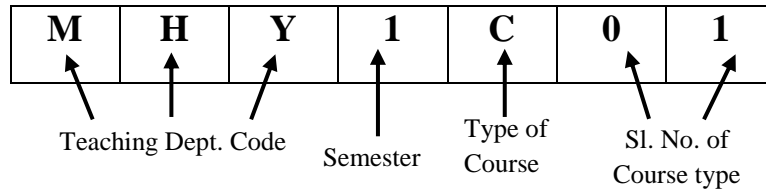


TABLE OF SCHEME AND EXAMINATION FROM 1ST TO 4TH SEMESTER**I SEMESTER**

DEPARTMENT OF CIVIL ENGINEERING SCHEME OF TEACHING AND EXAMINATION I SEMESTER M.Tech. Hydraulics Engineering (AUTONOMOUS SCHEME)						
Sl.No.	Subject Code	Subject	Hrs/week			Credits
			L	T	P	
1	AEM1C01	Applied Engineering Mathematics	4	0	0	4
2	MHY1C01	Surface Water Hydrology	4	2	0	5
3	MHY1C02	Free Surface flow	4	2	0	5
4	MHY1C03	Ideal Fluid Flow	3	2	0	4
5	MHY1E1XX	Department Elective-1	3	0	0	3
6	MHY1E2XX	Department Elective-2	3	0	0	3
7	MHY1CRM	Research Methodology	2	0	0	2
8	MHY1L01	Hydraulics and Hydrologic Engineering Laboratory	0	0	2	1
Total						27

Department Elective-1

Sl.No.	Code	Subject	Hrs/week			Credits
			L	T	P	
1	MHY1E101	Remote sensing and GIS Applications in Water Resource Engineering	3	0	0	3
2	MHY1E102	Irrigation Technology & Irrigation Water Management	3	0	0	3

Department Elective-2

Sl.No.	Code	Subject	Hrs/week			Credits
			L	T	P	
1	MHY1E201	Pipe Network Analysis	3	0	0	3
2	MHY1E202	Mechanics of sediment transport & river hydraulics	3	0	0	3

DEPARTMENT OF CIVIL ENGINEERING SCHEME OF TEACHING AND EXAMINATION II SEMESTER M.Tech. Hydraulics Engineering (AUTONOMOUS SCHEME)						
Sl.No.	Subject Code	Subject	Hrs/week			Credits
			L	T	P	
1	MHY2C01	Hydrological Modelling	4	2	0	5
2	MHY2C02	Hydro Power Engineering	4	0	0	4
3	MHY2C03	Ground Water Engineering	4	2	0	5
4	MHY2C04	Real Fluid Flow	3	2	0	4
5	MHY2E3XX	Department Elective-3	3	0	0	3
6	MHY2E4XX	Department Elective-4	3	0	0	3
7	MHY2IXX	Industry Driven Elective	2	0	0	2
8	MHY2L01	Hydro Systems Computational Laboratory	0	0	2	1
Total						27

Department Elective-3

Sl.No	Code	Subject	Hrs/week			Credits
			L	T	P	
1	MHY2E301	Design of Hydraulic Structures	3	0	0	3
2	MHY2E302	Water Resources Planning and Management	3	0	0	3

Department Elective-4

Sl.No	Code	Subject	Hrs/week			Credits
			L	T	P	
1	MHY2E401	Environmental Management of Water Resources	3	0	0	3
2	MHY2E402	Transport Process and Modelling in aquatic system	3	0	0	3

DEPARTMENT OF CIVIL ENGINEERING SCHEME OF TEACHING AND EXAMINATION III SEMESTER M.Tech. Hydraulics Engineering (AUTONOMOUS SCHEME)						
Sl.No.	Subject Code	Subject	L	T	P	Cr.
1	MHY3MOXX	Open Elective (MOOC) (8 Weeks) from other department	2	0	0	2
2	MHY3MXX	MOOC Elective (12 Weeks) Management Department	3	0	0	3
3	MHY3C02	Technical Seminar	0	0	0	1
4	MHY3C03	Internship	0	0	0	5
5	MHY3C04	Project Phase-I	0	0	0	8
Total Credits						19

Open Elective (MOOC)

Sl. No.	Subject Code	Subject	L	T	P	Cr.
1	MHY3MOXX	Open Elective (MOOC) (8 Weeks) from other department	2	0	0	2

MOOC Elective

Sl. No.	Subject Code	Subject	L	T	P	Cr.
1	MHY3MXX	MOOC Elective (12 Weeks) Management Department	3	0	0	3

IV SEMESTER

DEPARTMENT OF CIVIL ENGINEERING SCHEME OF TEACHING AND EXAMINATION IV SEMESTER M.Tech. Hydraulics Engineering (AUTONOMOUS SCHEME)						
Sl.No.	Subject Code	Subject	L	T	P	Cr.
1	MHY4C01	Project- Phase-2	0	0	0	15
Total Credits						15