MALLA REDDY
VISHWAVIDYAPEETH
(Deemed to be University)

SCHOOL OF DIGITAL HEALTH SCIENCES & TECHNOLOGY

Fellowship in Immersive Technology (AR/VR/MR)

Created in 2025

Academic regulations for fellowship programmes

1. **DEFINITION**

   Fellowship: A fellowship is an advanced, structured programme focused on developing specialized competencies after the completion of a qualifying degree or equivalent experience. It offers structured learning and practical experience in a focused area. The purpose of the fellowship is to develop advanced knowledge, strengthen specialized skills, and prepare participants for professional growth within their chosen field.

2. **AIMS AND OBJECTIVES**

   The aim of the program is to provide program nurtures graduate and postgraduate candidates, building their expertise and skills to drive career excellence and impact in their chosen field.

   Full-Time Candidate: A full-time candidate is an individual who is enrolled exclusively in the fellowship program and is not engaged in any other professional, academic or employment obligations during the training period. These candidates are required to dedicate their time and effort to the structured fellowship programme, meeting the assigned outcomes through full-time participation that ensures immersive training and continuous engagement in all programme activities, including assigned duties, learning sessions, and assessments. Stipends for full-time fellowship candidates will be awarded as per MRV policy.

   Internal Candidate: An internal candidate is an individual currently employed by MRV or its affiliated institutes who wish to enhance their skills through the fellowship during their tenure at the institution. This includes faculty, residents, or staff. Internal candidates are not eligible for a stipend. Applications are subject to institutional approval.

   External Candidate: An external candidate is someone not employed by MRV or its affiliated hospitals and institutes at the time of applying for the fellowship. They may come from other academic institutions, healthcare organizations, or private practice. External candidates are required to complete all fellowship requirements as per MRV guidelines. No stipend will be provided.

   Sponsored Candidate: A sponsored candidate is nominated and financially supported by a recognized institution, organization, or employer such as a government body, healthcare institution, academic organization, or industry partner to pursue a fellowship at MRV. The sponsor typically covers fees or other program-related costs and may require the candidate to fulfill certain obligations, if any, upon completion as required by the sponsor. Employees sponsored by organizations must provide a formal no-objection certificate. Sponsored candidates are not eligible for a stipend.

3. PREREQUISITES

Criteria	Details
Eligibility	To be eligible for admission into the fellowship program at MRV, candidates must meet the following criteria: • Hold a recognized graduate or postgraduate degree with a completion certificate. • The fellowship must align with the candidate's prior qualifications and may require professional registrations. • Detailed eligibility criteria for ach fellowship, including approved qualifications are available on the MRV website.
Duration	• Undergraduate Degrees – Any recognized undergraduate degree – 12 months • Postgraduate Degrees – Any recognized undergraduate degree – 6 months • Super specialty Degrees – Any recognized speciality or advanced degree – 3 months * Duration for any category may be adjusted based on program requirements, as recommended by the Selection Committee.
Mode of Study	Theoretical, Lab-based Development, Simulation Workshops, Clinical Scenario Building, Capstone Project, Practical, Skill, Case-based

4. SELECTION AND COMMENCEMENT OF FELLOWSHIP

Fellowship Committee: The Fellowship Committee is established to uphold principles of transparency, fairness, and meritocracy in the selection process for the MRV Fellowship Program.

Composition of Fellowship Selection Committee

Sr. No.	Role/Position	Description / Designation
1	Chairperson	The Dean of the respective colleges and Schools of Eminence at MRV
2	Subject Expert	A Professor or Associate Professor from the concerned colleges and Schools of Eminence, MRV
3	Guide / Co-Guide	A Professor, Associate Professor, or Assistant Professor from the concerned colleges and Schools of Eminence, MRV
4	Convener	The Fellowship Coordinator of MRV
5	Ex officio Members	The Registrar and the Controller of Examinations,

		MRV

Duties of the Fellowship Selection Committee

- Ensure that the MRV fellowship program commences twice a year in accordance with the academic calendar issued by the university.
- Oversee the preparation and communication of the program schedule, including application deadlines, interview dates, and the start of training through the MRV website and relevant academic departments.
- Thoroughly evaluate all applications to ensure candidates meet the minimum requirements for completion.
- Assess academic credentials, prior qualifications, and overall suitability for the fellowship program.
- Conduct interviews for shortlisted candidates to evaluate knowledge, skills, and overall preparedness.
- Recommend a final list of eligible candidates for approval by the Vice-Chancellor based on the evaluation and interview outcomes.
- Oversee all aspects of the fellowship program from scheduling, implementation, to completion.

5. FEE STRUCTURE

Program Fees: The basic fee structures for each fellowship program are available on the respective program on the MRV website.

6. PROCEDURE FOR SELECTION AND ADMISSION

- **Eligibility Check:** Verify that applicants meet the basic eligibility criteria, including academic qualifications, professional experience, and relevant skills.
- **Document Review:** The Selection Committee reviews all applications for completeness and ensures they satisfy the program's eligibility requirements.
- **Personal or Virtual Interviews:** Shortlisted candidates may be invited for interviews, either in person or virtually. This allows the Committee to assess communication skills, motivation, and overall suitability for the fellowship.
- **Merit-Based Selection:** The Committee selects the most qualified candidates based on a combination of academic performance, professional experience, interview performance, and alignment of the applicant's goals with the objectives of the fellowship.

7. ALLOTMENT OF FELLOWSHIP GUIDE

Assignment of Guides: The allotment of fellowship Guides shall be undertaken by the Selection Committee, ensuring that only eligible and approved faculty members are assigned as Guides or mentors.

Criteria for Allotment are based on:

- Alignment of the fellow's area of interest with the Guide's specialization
- Availability and consent of the Guide
- Existing rotation or merit-based preferences as determined by the Committee

Role and Responsibilities of the Guide:

- Mentoring the fellow to acquire required skills and academic knowledge
- Providing guidance and support to ensure progress throughout the fellowship

- Conducting regular evaluations and offering academic and professional advice and submit periodic report to the Fellowship coordinator
- Supporting the fellow in meeting program requirements and objectives

External Collaborators: External collaborators from recognized institution may serve as fellowship co-Guides in conjunction with a Guide from MRV.

Change of Guide: Fellows may request a change of Guide, subject to approval by the Selection Committee.

8. FELLOWSHIP PROGRAM DESIGN

The fellowship program is designed to provide a structured and comprehensive learning experience that develops relevant skills, knowledge, and professional competencies. Upon completion, they should demonstrate proficiency in core skills, apply their knowledge effectively in professional settings, maintain professional standards, and document their progress.

Logbook Maintenance: Fellows must maintain a logbook throughout the program. The required entries may vary depending on the fellowship. The logbook will be reviewed and evaluated on a daily or weekly basis by the assigned Guide. Regular face-to-face feedback sessions with the Guide will be conducted to monitor progress and provide guidance.

Final Assessment and Exit Examination:

The final assessment by the assigned guides includes the following components:

1. Multiple Choice Questions (MCQs): 25 marks
2. Practical Skills Assessment: Three case scenarios with discussion; each case carries 20 marks (total 60 marks)
3. Logbook Maintenance: 15 marks

The candidate must appear and secure a minimum of 50% marks in each of the above listed components. The total marks are 100, and a minimum aggregate score of 50% is required to successfully complete the fellowship.

Any additional outputs or deliverables may be determined in consultation with the Guide and require prior written approval from the Selection Committee.

9. MINIMUM STANDARD AND CREDITS FOR THE AWARD OF THE FELLOWSHIP

- Fellows must maintain a **minimum of 80% attendance** across all program activities.
- A **minimum overall score of 50%** is required to pass the fellowship.

10. FELLOWSHIP COMPLETION CERTIFICATE

Issued by MRV: Upon successful completion of all training, periodic evaluations, and final examinations, fellows will be awarded a certificate.

The certificate should include details such as:

- Name of the candidate
- Fellowship program details
- Program completion status

Fellowship in Immersive Technology (AR/VR/MR)

Course Overview

The Fellowship in Immersive Healthcare Technology equips learners with advanced knowledge and hands-on capability in designing, developing, and implementing AR, VR, and MR solutions for healthcare. The fellowship blends foundational theory with application-oriented learning, enabling participants to create immersive systems for clinical training, rehabilitation, patient education, healthcare simulation, digital twins, emergency care, and wellness environments.

Participants gain structured exposure to human–computer interaction, UI/UX for health, immersive storytelling, simulation development, sensing and audio systems, AI/ML integration, game-engine programming, and healthcare workflow adaptation. Through practical labs, prototyping exercises, case applications, and a capstone project, learners build the competence to translate immersive concepts into clinically meaningful, safe, user-centric, and scalable healthcare solutions.

Course Objectives

1. To provide foundational and advanced understanding of Immersive Technologies including AR, VR, and MR.
2. To develop competency in immersive system architecture, spatial computing, and interaction design.
3. To enable learners to design user-centered immersive interfaces focusing on usability, accessibility, ergonomics, and engagement.
4. To impart skills in creating immersive simulations, serious games, digital storytelling, and virtual training environments.
5. To build capability in integrating AI/ML, computer vision, sensing systems, immersive audio, and intelligent feedback mechanisms.
6. To train learners in developing prototypes using industry-standard platforms such as Unity, Unreal Engine, and related XR development tools.
7. To strengthen understanding of safety, ethics, human comfort, privacy, and responsible deployment of immersive systems.
8. To apply immersive solutions in real-world domains such as healthcare, education, rehabilitation, emergency response, wellness, and enterprise.
9. To equip participants with innovation capability, research thinking, evaluation, and documentation skills.
10. To prepare learners to conceptualize, develop, validate, and demonstrate a functional immersive project as part of the capstone.

Curriculum with Part-wise Syllabus & Modules

Part 1: Foundations of Medical Devices & Wearables

Module	Topics Covered
Interactive Narrative & Digital Storytelling	Immersive storytelling principles, branching narratives, engagement models, healthcare-centered story design
Human–Computer Interaction for Healthcare	Usability, accessibility, ergonomics, patient-centered interaction, rehabilitation-focused interfaces
UI/UX for Healthcare Immersive Systems	Healthcare-focused UX, inclusive design, interface stability, cognitive load considerations
2D & 3D Animation for Health Communication	Clinical visualization, patient education animations, content development for immersive environments
Applied AI/ML & Computer Vision in Immersive Tech	AI integration with immersive systems, perception modules, adaptive experiences
Programming for Game Engines	Unity/Unreal fundamentals, scripting, immersive interaction logic, prototype development
Practical Labs	UI/UX labs, VR engine labs, AI integration practicals

Part 2: Advanced Informatics, Analytics & Implementation

Module	Topics Covered
Immersive Audio & Sensory Interfaces	Interactive audio environments, haptics, sensory reinforcement
AR/VR/MR for Healthcare Applications	Clinical simulation, patient monitoring, ICU, emergency care, home-care
Simulation Applications in Healthcare	Scenario development, medical training simulation workflows
Digital Twins in Healthcare	Virtual care environments, patient condition virtualization
Immersive Systems for Rehabilitation	Motor & cognitive rehabilitation immersive therapy
Healthcare Workflow Integration & Evaluation	Motor & cognitive rehabilitation immersive therapy
Capstone Project	Design, develop, validate immersive healthcare solution

Program Outcomes

SR.N.	Program Outcome	Detailed Description
1	**Understanding Immersive Ecosystems**	Demonstrate knowledge of immersive system architecture, XR technologies, simulation logic, and application pathways
2	**Immersive Experience & Interaction Competency**	Design meaningful, accessible and user-centric immersive experiences aligned to real-world environments
3	**Intelligent & Data-Driven Immersive Systems**	Integrate AI/ML, analytics, and adaptive interaction within immersive applications
4	**Ethical, Safety & Accessibility Awareness**	Apply safety standards, ethical frameworks, validation requirements, and accessibility considerations
5	**Immersive System Development & Deployment Capability**	Use immersive development tools, engines and platforms to produce functional outputs
6	**Application Adaptability**	Map immersive technology use cases to healthcare, rehabilitation, education, training, emergency and enterprise solutions
7	**Innovation Orientation**	Apply design thinking and creative engineering for novel immersive solutions
8	**Practical Validation & Reporting**	Demonstrate testing, user evaluation, documentation and presentation of immersive solution performance

Course Outcomes

	Course Outcome	Detailed Description
1	**Explain Fundamentals of Immersive Technologies**	Understand AR/VR/MR concepts, immersive environment architecture, spatial computing principles, and their relevance to real-world applications
2	**Design User-Centric Immersive Interfaces & Experiences**	Build immersive simulations, virtual environments, and interactive storytelling structures for learning, training, healthcare, and engagement
3	**Develop Interactive Simulations & Narratives**	Build immersive simulations, virtual environments, and interactive storytelling structures for learning, training, healthcare, and engagement
4	**Integrate AI, Sensory & Data Intelligence**	Embed AI/ML modules, computer vision, immersive audio, haptics, and adaptive intelligence into immersive systems
5	**Prototype Immersive Applications Using Game Engines**	Use Unity, Unreal or equivalent development platforms to design, build and test functional immersive

		applications
6	**Apply Immersive Systems to Real-World Use Cases**	Implement immersive solutions across healthcare, education, emergency response, training, rehabilitation and enterprise innovation
7	**Apply Immersive Systems to Real-World Use Cases**	Evaluate usability, safety, user comfort, privacy, ethics, and responsible implementation of immersive environments
8	**Demonstrate Applied Innovation Through Capstone Project**	Design, develop, validate and present a real-world immersive project supported by documentation, testing and evaluation

Recommended Books & E-Resources

Textbooks:

- Medical Instrumentation & Design — Webster
- Fundamentals of Wearable Biopotential Monitoring — Huigen
- The Art of Electronics — Horowitz
- Embedded Systems Design — Vahid
- ISO 13485 Handbook — Regulatory Affairs

Journals & E-Resources:

- IEEE Xplore Medical Instrumentation
- IEC Standards Documentation
- CDSCO Guidelines
- FDA Medical Device Technical Resources
- MATLAB Biomedical Toolbox
- ROS/Embedded GitHub Open Libraries