MALLA REDDY
VISHWAVIDYAPEETH
(Deemed to be University)

SCHOOL OF DIGITAL HEALTH SCIENCES & TECHNOLOGY

Fellowship in Immersive Health Care Design and Development

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 Health Care Design and Development

Course Overview

The Fellowship in Immersive Health Care Design & Development equips learners with advanced skills in designing, developing, and implementing immersive technologies—Virtual Reality (VR), Augmented Reality (AR), Mixed Reality (MR), and Simulation-based Training Systems—for healthcare education, clinical training, patient engagement, and digital therapeutics.

The program blends principles of instructional design, 3D modelling, human-computer interaction, simulation engineering, clinical scenario design, and immersive technology integration within healthcare workflows. Inspired by global best practices in XR education and high-fidelity simulation, the fellowship prepares learners to conceptualize, prototype, and deploy immersive learning solutions for hospitals, medical colleges, nursing schools, and public-health training environments.

Course Objectives

1. To introduce foundational concepts of immersive technologies (VR, AR, MR, XR) and their applications in healthcare.
2. To build skills in 3D modelling, interaction design, simulation scripting, and immersive content development.
3. To train learners to design clinical training modules, virtual procedures, anatomy visualizations, and skill-based simulation experiences.
4. To provide practical understanding of healthcare education frameworks, competency-based training, and scenario-based learning.
5. To equip learners to use XR for clinical decision support, surgical rehearsal, patient education, and rehabilitation workflows.
6. To develop technical abilities in Unity/Unreal development, motion capture, haptics, sensory feedback systems, and XR hardware integration.
7. To train learners in usability testing, validation, safety, ethics, and regulatory considerations in immersive healthcare solutions.
8. To prepare professionals to conceptualize and lead the development of immersive simulation labs, XR learning programs, and digital health innovations.

Curriculum with Part-wise Syllabus & Modules

Part 1: Foundations of Immersive Technologies in Healthcare

Module	Topics Covered
Introduction to XR in Healthcare	Types of immersive technology (AR, VR, MR, XR); role in healthcare learning; anatomy visualization; workflow integration; global case studies; benefits & limitations
Instructional & Simulation Design for Healthcare	Educational psychology for XR; competency-based learning; scenario design; fidelity levels; debriefing models; simulation frameworks; patient safety principles
3D Modelling & Environment Design	Basics of 3D assets, mesh modelling, textures, lighting; anatomy and procedure modelling; simulation environment architecture; working with Blender/3ds Max
Interaction Design & User Experience in XR	Human–Computer Interaction (HCI), affordances in XR, gesture control, voice interaction, haptics, feedback loops, accessibility in immersive systems
Ethics, Safety & Regulatory Aspects	Privacy, psychological safety in VR, motion sickness management, safety protocols in simulation, copyright for 3D assets, guidelines for clinical XR systems

Part 2: XR Development, Simulation Engineering & Clinical Applications

Module	Topics Covered
XR Development Tools (Unity / Unreal Engine)	Introduction to XR development; scripting interactions; adding physics; integrating models; optimizing performance; publishing to XR headsets
Clinical Scenario Simulation & Digital Patients	Virtual standardized patients; communication simulations; emergency scenarios; surgical simulations; task-based skills training; multi-user environments
Multi-modal Imaging & Data Fusion + Sensing Integration	Hospital operations data: admissions, bed occupancy, staffing, supply chain; optimizing workflows; cost analytics; quality metrics; performance dashboards; operational decision support
XR for Clinical Practice, Education & Rehabilitation	XR for surgical rehearsal, VR therapy, pain distraction, cognitive rehabilitation, physiotherapy simulation, tele-XR, remote collaboration
Hardware Ecosystem & Emerging Technologies	VR headsets, AR smart glasses, MR devices, motion capture suits, eye-tracking, haptics; mixed-modality sensing; AI-enabled XR; digital twin integration
Capstone Project	Develop an immersive healthcare solution: choose a clinical domain, design scenario, develop 3D assets, build interactive XR application, test with users, document & present findings

Program Outcomes

SR.N.	Program Outcome	Detailed Description
1	**Understanding of Immersive Healthcare Ecosystems**	Demonstrate comprehensive knowledge of XR technologies, simulations, workflows, and their role in training, education, and clinical practice
2	**Competence in 3D Design & XR Asset Creation**	Build 3D models, environments, and interactive elements for healthcare simulations
3	**Proficiency in XR Development Tools**	Develop functional immersive applications using Unity/Unreal, integrating interactions, animations, and sensory feedback
4	**Ability to Design Clinical Training Simulations**	Create effective, safe, competency-based clinical scenarios for immersive learning
5	**Integration of XR with Healthcare Practices**	Apply XR solutions for surgical practice, patient education, rehabilitation, and remote care
6	**Evaluation & Validation Skills**	Assess usability, learning outcomes, safety, and clinical relevance of XR applications
7	**Ethical, Legal & Safety Awareness**	Apply ethical principles, privacy requirements, and regulatory norms to immersive healthcare designs
8	**Leadership in Immersive Health Innovation**	Lead XR-based development projects, manage simulation labs, and collaborate with clinical and technical teams to implement immersive solutions

Course Outcomes

	Course Outcome	Detailed Description
1	**Explain Immersive Technologies & Applications**	Understand VR/AR/MR fundamentals, device ecosystems, and clinical use cases
2	**Build 3D Models & XR Environments**	Create healthcare-specific environments, anatomical models, and surgical spaces in 3D
3	**Develop Interactive XR Applications**	Implement user interactions, simulation sequences, and training workflows using XR engines
4	**Design Clinical Scenarios for XR Training**	Develop realistic, measurable, and competency-oriented simulation scenarios
5	**Integrate XR into Healthcare Workflows**	Apply XR to procedures, rehabilitation, patient engagement, and medical education
6	**Conduct Usability & Simulation Evaluation**	Measure learning outcomes, identify design flaws, conduct debriefings, and refine XR modules

7	**Ensure Safety, Ethics & Compliance**	Apply privacy, psychological safety, and regulatory guidelines in immersive design
8	**Produce a Working XR Capstone System**	Deliver a complete immersive prototype solving a real healthcare problem, ready for demonstration

Recommended Books & E-Resources
Textbooks:

- Virtual Reality in Healthcare – CRC Press
- Designing XR Experiences – Erin Pangilinan
- Healthcare Simulation: A Practical Guide – Jeffries et al.
- Human Factors in Healthcare Simulation – Lioce, Lopreiato