PROGRAM OUTCOME (POs)	
Course Code	**M.Sc. Health Informatics**
PO1	Apply foundational knowledge in health and medical sciences to develop informatics solutions
PO2	Utilize biostatistics and research methodology to drive data driven healthcare innovations and conduct research
PO3	Implement health information management practices in various healthcare settings
PO4	Harness Advanced Computing Skills to Develop and Manage Innovative Health Informatics Projects
PO5	Demonstrate effective communication skills within healthcare environments, critical thinking and ethical reasoning to address societal challenges, uphold human rights, manage crises, and apply bioethical principles in healthcare and research.
PO6	Integrate healthcare financing principles in health informatics initiatives
PO 7	Employ data analytics and machine learning techniques for improved healthcare outcomes
PO8	Design and develop web and mobile applications for healthcare purposes and identify business opportunity.
COURSE OUTCOMES (COs)	
SEMESTER I	
MHIMT 101 T	**Basics of Health Informatics & Health Information Management**
CO1	Develop a comprehensive understanding of healthcare systems and the role of health information in improving patient care.
CO2	Gain proficiency in managing health records, including the legal aspects, documentation, and quality control.
CO3	Demonstrate mastery in the use of health informatics technologies, such as EHRs, CDSS, and HIE, and ethical, legal, and regulatory issues associated with health information and informatics.
CO4	Explore emerging trends in health informatics and their implications for future healthcare.
CO5	Apply theoretical knowledge to practical scenarios in health information management and informatics.
MHIMT 102 T	**Hospital Administration and Healthcare Financing**
CO1	Understand and apply healthcare management principles and policies.
CO2	Analyze the financial management strategies and budgeting within healthcare organizations.
CO3	Implement quality improvement and patient safety protocols.
CO4	Navigate health economics, healthcare finance, and insurance systems.
CO5	Develop skills in resource tracking, management, and financial auditing in the healthcare sector.
CC 001 T	**Research Methodology & Biostatistics (Core Course)**
CO1	Understand the basic concepts of biostatistics and their application in research
CO2	Describe the appropriate statistical methods required for a particular research design
CO3	Develop an appropriate framework for research studies and Data Analysis
MHIMT 103 E	**Fundamentals of Computer Application**
CO1	Understand the basics of computer hardware and software, various windows accessories and the functioning of the control panel
CO2	Demonstrate Skill in essential Microsoft Office applications
CO3	Apply database management system concepts when designing the different database objects.
CO4	Demonstrate Skill in Using Computer Networks, network topologies and Devices.
CO5	Understanding about emerging computer technologies like Blockchain, Machine Learning.
MHIMT 104 P	**Python Basics**
CO1	Develop a solid understanding of Python's syntax and semantics, including data types, variables, operators, and basic control structures.
CO2	Demonstrate Competency in working with Python's core data structures, including lists, ranges, tuples, dictionaries, and sets.
CO3	Handle input and output operations in Python, including reading from and writing to files, and interacting with user input in a robust manner.
CO4	Apply the principles of modular programming by defining and using functions, including the use of parameters, return values, and variable scope.
CO5	Acquire the ability to implement object-oriented programming concepts in Python, such as classes, objects, inheritance, and polymorphism, to create reusable and maintainable code.
CO6	Master the techniques for managing errors and exceptions in Python, ensuring that programs can handle unexpected situations gracefully and continue to operate correctly.
C07	Explore the use of regular expressions in Python for pattern matching and text processing, gaining the ability to handle complex string manipulation tasks.

SEMESTER II	
MHIMT 105 T & MHIMT 109 E	**Advanced Health Informatics & HI Practicum**
CO1	Understand the management of various advanced health informatics applications
CO2	Interpret the application of health informatics for managing patient data and supporting healthcare professionals in making a quality decision
CO3	Describe the content and features to be included in the informatics application to the application developer in making advance and expert informatics application
CO4	Identify the trends and emerging technology for informatics application in healthcare settings.
CO5	Recognize the future requirement using various approaches and prediction tools
CO6	Develop awareness, understanding and capacity in the specific roles and responsibilities of a health information management professional
CO7	Understand through an intensive experience the nature of hospitals and health care settings as workplaces and their associated values, routines and cultures
CO8	Develop skill and professional capacity for managing the health information system of a health care setting
C09	Develop competency to plan, implement, and carry out a clinical audit in the quality assurance cell
CO10	Demonstrate competency to plan, implement, and carry out a claims processing in the health insurance department
MHIMT 106 T	**Clinical Workflow, Process Redesigning & Clinical Documentation Improvement (CDI)**
CO1	Understand the concepts and importance of clinical workflow and process redesign, including the role of Clinical Documentation Improvement (CDI) programs and CDI specialists.
CO2	Identify focus areas for medical documentation improvements and the benefits of CDI programs.
CO3	Apply workflow analysis techniques to evaluate and document clinical processes, creating process maps to visualize workflows.
CO4	Identify bottlenecks, inefficiencies, and areas for improvement in clinical processes, and apply knowledge of CDI metrics to measure improvement outcomes.
CO5	Develop & Implement a plan for clinical process redesign, incorporating change management strategies to facilitate workflow optimization.
CO6	Apply various processes of a CDI program in both inpatient and outpatient settings, leveraging technology to enhance clinical workflow.
CO7	Evaluate the role of technology in clinical workflow enhancement and apply CDI principles to improve documentation practices and quality metrics.
MHIMT 107 T & MHIMT 110 P	**Medical Language & International Classification of Disease Coding**
CO1	Describe medical terminologies and their components, including stem words/root, prefixes, and suffixes.
CO2	Explain the concepts of body systems and identify the terminologies related to body systems, diseases, diagnostic, therapeutic tests, and procedures.
CO3	Enumerate surgical procedures, diseases, disorders, and dysfunctions.
CO4	Develop an understanding of medical abbreviations, signs and symptoms and common medical terms.
CO5	Apply the principles of medical coding using various coding systems.
CO6	Explain how the disease classification system integrates with health information systems and supports healthcare data management.
MHIMT 108 T & MHIMT 111 P	**Medical Transcribing & Editing**
CO1	Understand medical report formats, transcription principles, editing and proofreading rules specific to medical content.
CO2	Develop skill and knowledge to accurately transcribe and edit health-related information
CO3	Demonstrate Skill in using natural language processing and other transcription software and applications in Medical Transcribing.
DISCIPLINE SPECIFIC ELECTIVE	
DSE 001 P	**Web Development Basics (Optional 1)**
CO1	Understand the fundamental concepts of web development.
CO2	Demonstrate skill in front-end and back-end web development.
CO3	Develop Skill to create responsive and dynamic websites.
DSE 002 P	**Advanced Python (Optional 2)**
CO1	Understanding the core principles and exploring advanced features and libraries of Python
CO2	Develop ability to implement multithreaded programs in Python, intricacies of concurrent execution and thread management to improve application performance.
CO3	Demonstrate Skill in using Python for database interactions, including connecting to databases, executing queries, and managing data using libraries such as SQLite, MySQL, and Postgre SQL.
CO4	Utilize Python for data analysis tasks, including data manipulation, statistical analysis, and visualization using libraries such as NumPy, pandas, and Matplotlib.

MGM SCHOOL OF BIOMEDICAL SCIENCES, NAVI MUMBAI

(A constituent unit of MGM INSTITUTE OF HEALTH SCIENCES)

(Deemed University u/s 3 of UGC Act 1956)

Grade "A++" Accredited by NAAC

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CO PO Mapping
Programe - M.Sc. Health Informatics
Semester I and II

PO1	Apply foundational knowledge in health and medical sciences to develop informatics solutions
PO2	Utilize biostatistics and research methodology to drive data driven healthcare innovations and conduct research
PO3	Implement health information management practices in various healthcare settings
PO4	Harness Advanced Computing Skills to Develop and Manage Innovative Health Informatics Projects
PO5	Demonstrate effective communication skills within healthcare environments, critical thinking and ethical reasoning to address societal challenges, uphold human rights, manage crises, and apply bioethical principles in healthcare and research.
PO6	Integrate healthcare financing principles in health informatics initiatives
PO7	Employ data analytics and machine learning techniques for improved healthcare outcomes
PO8	Design and develop web and mobile applications for healthcare purposes and identify business opportunity.

PO Mapping same with correlation level 3,2,1 The notation of 1 - low, 2 - moderate , 3 - high

Semester	Course / Course Code	Course Outcome	Course Outcome	Health Informatics Solutions	Data Research	Information Management	Computing Solutions	Effective Communication, critical thinking & ethical reasoning	Financial Integration	Analytics & AI	App Development	Average
				PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	
Semester 1	Basics of Health Informatics & Health Information Management (MHIMT 101 T)	CO1	Develop a comprehensive understanding of healthcare systems and the role of health information in improving patient care.	3	--	3	--	--	--	--	--	3.0
		CO2	Gain proficiency in managing health records, including the legal aspects, documentation, and quality control.	3	--	3	--	--	--	--	--	3.0
		CO3	Demonstrate mastery in the use of health informatics technologies, such as EHRs, CDSS, and HIE, and ethical, legal, and regulatory issues associated with health information and informatics.	3	--	3	--	--	--	--	--	3.0
		CO4	Explore emerging trends in health informatics and their implications for future healthcare.	2	--	2	--	--	--	--	--	2.0
		CO5	Apply theoretical knowledge to practical scenarios in health information management and informatics.	2	--	2	--	--	--	--	--	2.0
		Average		2.6		2.6						2.6
	Hospital Administration and Healthcare Financing (MHIMT 102 T)	CO1	Understand and apply healthcare management principles and policies.	--	--	2	--	--	--	--	--	2.0
		CO2	Analyze the financial management strategies and budgeting within healthcare organizations.	--	--	--	--	--	2	--	--	2.0
		CO3	Implement quality improvement and patient safety protocols.	--	--	3	--	3	--	--	--	3.0
		CO4	Navigate health economics, healthcare finance, and insurance systems.	--	--	--	--	--	2	--	--	2.0
		CO5	Develop skills in resource tracking, management, and financial auditing in the healthcare sector.	--	--	2	--	--	2	--	--	2.0
		Average				2.3		3.00	2.00			2.2

	Research Methodology & Biostatistics (Core Course)(CC 001 T & CC 001 P)	CO1	Understand the basic concepts of biostatistics and their application in research	--	3	--	--	--	--	--	--	3.0
		CO2	Describe the appropriate statistical methods required for a particular research design	--	2	--	--	--	--	--	--	2.0
		CO3	Develop an appropriate framework for research studies and Data Analysis	--	2	--	--	--	--	--	--	2.0
		Average			2.3							2.3
	Fundamentals of Computer Application (MHIMT 103 E)	CO1	Understand the basics of computer hardware and software, various windows accessories and the functioning of the control panel	--	--	--	3	--	--	--	--	3.0
		CO2	Demonstrate Skill in essential Microsoft Office applications	--	--	--	3	--	--	--	--	3.0
		CO3	Apply database management system concepts when designing the different database objects.	--	--	--	2	--	--	--	--	2.0
		CO4	Demonstrate Skill in Using Computer Networks, network topologies and Devices.	--	--	--	1	--	--	--	--	1.0
		CO5	Understanding about emerging computer technologies like Blockchain, Machine Learning.	--	--	--	2	--	--	--	--	2.0
		Average					2.2					2.2
	Python Basics (MHIMT 104 P)	CO1	Develop a solid understanding of Python's syntax and semantics, including data types, variables, operators, and basic control structures.	--	--	--	3	--	--	--	--	3.0
		CO2	Demonstrate Competency in working with Python's core data structures, including lists, ranges, tuples, dictionaries, and sets.	--	--	--	2	--	--	--	--	2.0
		CO3	Handle input and output operations in Python, including reading from and writing to files, and interacting with user input in a robust manner.	--	--	--	2	--	--	--	--	2.0
		CO4	Apply the principles of modular programming by defining and using functions, including the use of parameters, return values, and variable scope.	--	--	--	3	--	--	--	--	3.0
		CO5	Acquire the ability to implement object-oriented programming concepts in Python, such as classes, objects, inheritance, and polymorphism, to create reusable and maintainable code.	--	--	--	2	--	--	--	--	2.0
		CO6	Master the techniques for managing errors and exceptions in Python, ensuring that programs can handle unexpected situations gracefully and continue to operate correctly.	--	--	--	3	--	--	--	--	3.0
		CO7	Explore the use of regular expressions in Python for pattern matching and text processing, gaining the ability to handle complex string manipulation tasks.	--	--	--	2	--	--	--	--	2.0
		Average					2.4					2.4
Semester 2	**Advanced Health Informatics & HI Practicum (MHIMT 105 T & MHIMT 109 E)**	CO1	Understand the management of various advanced health informatics applications	3	--	3	--	3	--	--	--	3.0
		CO2	Interpret the application of health informatics for managing patient data and supporting healthcare professionals in making a quality decision	2	--	3	--	2	--	--	--	2.3
		CO3	Describe the content and features to be included in the informatics application to the application developer in making advance and expert informatics application	3	--	3	--	3	--	--	--	3.0
		CO4	Identify the trends and emerging technology for informatics application in healthcare settings.	2	--	2	--	2	--	--	--	2.0
		CO5	Recognize the future requirement using various approaches and prediction tools	2	--	3	--	2	--	--	--	2.3
		CO6	Develop awareness, understanding and capacity in the specific roles and responsibilities of a health information management professional	3	--	3	--	3	--	--	--	3.0
		CO7	Understand through an intensive experience the nature of hospitals and health care settings as workplaces and their associated values, routines and cultures	3	--	2	--	3	--	--	--	2.7
		CO8	Develop skill and professional capacity for managing the health information system of a health care setting	2	--	3	--	3	--	--	--	2.7

	CO9	Develop competency to plan, implement, and carry out a clinical audit in the quality assurance cell	2	--	2	--	2	--	--	--	2.0
	CO10	Demonstrate competency to plan, implement, and carry out a claims processing in the health insurance department	2	--	2	--	2	2	--	--	2.0
	Average		2.4		2.6		2.5	2.0			2.5
Clinical Workflow, Process Redesigning & Clinical Documentation Improvement (CDI) (MHIMT 106 T)	CO1	Understand the concepts and importance of clinical workflow and process redesign, including the role of Clinical Documentation Improvement (CDI) programs and CDI specialists.	2	--	3	--	--	--	--	--	2.5
	CO2	Identify focus areas for medical documentation improvements and the benefits of CDI programs.	2	--	3	--	--	--	--	--	2.5
	CO3	Apply workflow analysis techniques to evaluate and document clinical processes, creating process maps to visualize workflows.	2	--	3	--	--	--	--	--	2.5
	CO4	Identify bottlenecks, inefficiencies, and areas for improvement in clinical processes, and apply knowledge of CDI metrics to measure improvement outcomes.	2	--	3	--	--	--	--	--	2.5
	CO5	Develop & Implement a plan for clinical process redesign, incorporating change management strategies to facilitate workflow optimization.	2	--	3	--	--	--	--	--	2.5
	CO6	Apply various processes of a CDI program in both inpatient and outpatient settings, leveraging technology to enhance clinical workflow.	2	--	3	--	--	--	--	--	2.5
	CO7	Evaluate the role of technology in clinical workflow enhancement and apply CDI principles to improve documentation practices and quality metrics.	2	--	3	--	--	--	--	--	2.5
	Average		2.0		3.0						2.5
Medical Language & International Classification of Disease Coding (MHIMT 107 T & MHIMT 110 P)	CO1	Describe medical terminologies and their components, including stem words/root, prefixes, and suffixes.	3	--	2	--	--	--	--	--	2.5
	CO2	Explain the concepts of body systems and identify the terminologies related to body systems, diseases, diagnostic, therapeutic tests, and procedures.	3	--	2	--	--	--	--	--	2.5
	CO3	Enumerate surgical procedures, diseases, disorders, and dysfunctions.	3	--	3	--	--	--	--	--	3.0
	CO4	Develop an understanding of medical abbreviations, signs and symptoms and common medical terms.	3	--	3	--	--	--	--	--	3.0
	CO5	Apply the principles of medical coding using various coding systems.	3	--	3	--	--	--	--	--	3.0
	CO6	Explain how the disease classification system integrates with health information systems and supports healthcare data management.	2	--	3	--	--	--	--	--	2.5
	Average		2.8		2.7						2.8
Medical Transcribing & Editing (MHIMT 108 T & MHIMT 111 P)	CO1	Understand medical report formats, transcription principles, editing and proofreading rules specific to medical content.	3	--	2	--	--	--	--	--	2.5
	CO2	Develop skill and knowledge to accurately transcribe and edit health-related information	3	--	2	--	--	--	--	--	2.5
	CO3	Demonstrate Skill in using natural language processing and other transcription software and applications in Medical Transcribing.	3	--	2	--	--	--	--	--	2.5
	Average		3		2						2.5
Web Development Basics (DSE 001 P)	CO1	Understand the fundamental concepts of web development.	--	--	--	--	--	--	--	3	3.0
	CO2	Demonstrate skill in front-end and back-end web development.	--	--	--	--	--	--	--	3	3.0
	CO3	Develop Skill to create responsive and dynamic websites.	--	--	--	--	--	--	--	3	3.0
	Average									3.0	3.0
Advanced Python (DSE 002 P)	CO1	Understanding the core principles and exploring advanced features and libraries of Python	--	--	--	--	--	--	3		3.0
	CO2	Develop ability to implement multithreaded programs in Python, intricacies of concurrent execution and thread management to improve application performance.	--	--	--	--	--	--	3		3.0

		CO3	Demonstrate Skill in using Python for database interactions, including connecting to databases, executing queries, and managing data using libraries such as SQLite, MySQL, and Postgre SQL.	--	--	--	--	--	--	3		3.0
		CO4	Utilize Python for data analysis tasks, including data manipulation, statistical analysis, and visualization using libraries such as NumPy, pandas, and Matplotlib.	--	--	--	--	--	--	3		3.0
		Average								3.0		3.0

PROGRAM OUTCOME (POs)	
Course Code	**M.Sc. Health Informatics**
PO1	Apply foundational knowledge in health and medical sciences to develop informatics solutions
PO2	Utilize biostatistics and research methodology to drive data driven healthcare innovations and conduct
PO3	Implement health information management practices in various healthcare settings
PO4	Harness Advanced Computing Skills to Develop and Manage Innovative Health Informatics Projects
PO5	Demonstrate effective communication skills within healthcare environments, critical thinking and ethical reasoning to address societal challenges, uphold human rights, manage crises, and apply bioethical principles in healthcare and research.
PO6	Integrate healthcare financing principles in health informatics initiatives
PO7	Employ data analytics and machine learning techniques for improved healthcare outcomes
PO8	opportunity.
Course Outcomes (COs)	
Course Code	**M.Sc. Health Informatics**
SEMESTER III	
MHIMT 112 T	**Entrepreneurship and Health IT Project Management**
CO1	Analyze the process of innovation and new idea generation and explain the business environment to identify business opportunities.
CO2	Evaluate and apply different entrepreneurial strategies and assess the new venture feasibility and risk evaluation.
CO3	Explain project management process, lifecycle and its organization.
CO4	Explain the monitoring, evaluation and control process involve in the project management.
MHIMT 113 T	**Managing Health Information Systems**
CO1	Plan, Monitor, organization and control the health Information system and its resources required for managing patient data.
CO2	Demonstrate the leadership role in healthcare IT projects and related activities.
CO3	Analyze the Benefits, Cultural Challenges, and issues in adopting health information system and application.
CO4	Demonstrate the application of knowledge management system in healthcare organization.
CO5	Develop various QA approach in implementing and managing health information system
CO6	Apply the concept of Information Governance in managing healthcare and healthcare data management.
MHIMT 114	**Research Project / Dissertation**
CO1	Develop healthcare informatics solutions that align with industry standards and regulatory requirements.
CO2	Evaluate healthcare challenges and design innovative IT-based interventions.
CO3	Implement secure and interoperable health information systems using industry frameworks.
CO4	Demonstrate project management skills to plan, execute, and optimize healthcare IT projects.
CO5	Collaborate effectively with multidisciplinary teams to integrate healthcare and IT expertise.
CO6	Assess system performance through testing and optimization to improve cybersecurity and efficiency.
MHIMT 115 P	**Database Management System**
CO1	Understand the core principles of database management systems, including data modeling, database architecture, and normalization techniques.

CO2	Develop proficiency in using Structured Query Language (SQL) for data definition, manipulation, and querying within MySQL.
CO3	Learn to design and implement databases that are efficient, scalable, and secure, applying best practices in data modeling and normalization.
CO4	Apply theoretical knowledge through practical lab sessions and projects, developing real-world databases and solving complex data management problems.
MHIMT 116 P	**Advanced Web Development**
CO1	Understanding of advanced web development concepts.
CO2	Gain expertise in modern web technologies and frameworks.
CO3	Develop the ability to build complex, scalable, and secure web applications
MHIMT 117 P	**Mobile Application Development for Health Care**
CO1	Understand the fundamentals of mobile application development in the healthcare context
CO2	Gain proficiency in modern mobile development technologies and frameworks.
CO3	Develop the ability to design, implement, test, and deploy secure and effective mHealth applications.
MHIMT 118 P	**Machine Learning in Health Care**
CO1	Understand the fundamental concepts and techniques of machine learning.
CO2	Gain proficiency in implementing machine learning algorithms using modern tools and frameworks.
CO3	Learn to train, evaluate and improve machine learning models.
MHIMT 119 P	**Data Visualization and Reporting in Health Care**
CO1	Understand the fundamentals of data visualization and reporting in the healthcare context.
CO2	Gain proficiency in using modern data visualization tools and technologies and to learn best practices for data reporting and presentation
CO3	Develop the ability to create clear and effective visualizations that communicate complex healthcare data.
SEMESTER IV	
MHIMT 120 T	**Bioethics, IPR, and Biosafety**
CO1	Evaluate ethical concerns in biomedical and biotechnological practices.
CO2	Understand different types of IPR and their applications.
CO3	Apply various national and international guidelines in biomedical and health research.
MHIMT 114	**Research Project / Dissertation**
CO1	Develop healthcare informatics solutions that align with industry standards and regulatory requirements.
CO2	Evaluate healthcare challenges and design innovative IT-based interventions.
CO3	Implement secure and interoperable health information systems using industry frameworks.
CO4	Demonstrate project management skills to plan, execute, and optimize healthcare IT projects.
CO5	Collaborate effectively with multidisciplinary teams to integrate healthcare and IT expertise.
CO6	Assess system performance through testing and optimization to improve cybersecurity and efficiency.
MHIMT 121	**Internship**
CO1	Develop healthcare informatics solutions that align with industry standards and regulatory requirements.
CO2	Apply health informatics methods to clinical workflows and care processes.
CO3	Understand the practical health IT deliverable that meets local requirements and best industry practices.
CO4	Analyze the data quality, privacy & governance and communicate findings to stakeholders
CO5	Exhibit improved professional skills including communication, teamwork, adaptability, and workplace ethics.

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CO PO Mapping
Programe - M.Sc. Health Informatics
Semester III and IV

PO1 **Apply foundational knowledge in health and medical sciences to develop informatics solutions**
PO2 **Utilize biostatistics and research methodology to drive data driven healthcare innovations and conduct research**
PO3 **Implement health information management practices in various healthcare settings**
PO4 **Harness Advanced Computing Skills to Develop and Manage Innovative Health Informatics Projects**
PO5 **Demonstrate effective communication skills within healthcare environments, critical thinking and ethical reasoning to address societal challenges, uphold human rights, manage crises, and apply bioethical principles in healthcare and research.**
PO6 **Integrate healthcare financing principles in health informatics initiatives**
PO7 **Employ data analytics and machine learning techniques for improved healthcare outcomes**
PO8 **Design and develop web and mobile applications for healthcare purposes and identify business opportunity.**

PO Mapping same with correlation level 3,2,1 The notation of 1 - low, 2 - moderate , 3 - high

Semester	Course / Course Code	Course Outcome	Course Outcome	Health Informatics Solutions	Data Research	Information Management	Computing Solutions	Effective Communication, critical thinking & ethical reasoning	Financial Integration	Analytics & AI	App Development	Average
				PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	
Semester 3	Entrepreneurship and Health IT Project Management (MHIMT 112 T)	CO1	Analyze the process of innovation and new idea generation and explain the business environment to identify business opportunities.	3	--	--	--	--	--	--	2	2.5
		CO2	Evaluate and apply different entrepreneurial strategies and assess the new venture feasibility and risk evaluation.	3	--	--	--	--	--	--	2	2.5
		CO3	Explain project management process, lifecycle and its organization.	--	--	2	--	--	--	--	--	2.0
		CO4	Explain the monitoring, evaluation and control process involve in the project management.	--	--	3	--	--	--	--	--	3.0
		Average		3.0		2.5						2.5
	Managing Health Information Systems (MHIMT 113 T)	CO1	Plan, Monitor, organization and control the health Information system and its resources required for managing patient data.	2	--	3	--	--	--	--	--	2.5
		CO2	Demonstrate the leadership role in healthcare IT projects and related activities.	--	--	3	--	3	2	--	--	2.7
		CO3	Analyze the Benefits, Cultural Challenges, and issues in adopting health information system and application.	3	--	--	--	--	--	--	--	3.0

	CO4	Demonstrate the application of knowledge management system in healthcare organization.	1	--	3	--	--	--	--	--	2.0
	CO5	Develop various QA approach in implementing and managing health information system	2	--	3	--	--	--	--	--	2.5
	CO6	Apply the concept of Information Governance in managing healthcare and healthcare data management.	1	--	3	--	--	--	--	--	2.0
	Average		1.8		3.0		3.00	2.00			2.4
Research Project / Dissertation (MHIMT 114)	CO1	Develop healthcare informatics solutions that align with industry standards and regulatory requirements.	3	--	--		--	--	--	3	3.0
	CO2	Evaluate healthcare challenges and design innovative IT-based interventions.	3	--	--		--	--	--	3	3.0
	CO3	Implement secure and interoperable health information systems using industry frameworks.	3	--	--		--	--	--	3	3.0
	CO4	Demonstrate project management skills to plan, execute, and optimize healthcare IT projects.	3	--	--		--	--	--	3	3.0
	CO5	Collaborate effectively with multidisciplinary teams to integrate healthcare and IT expertise.	3	--	--		--	--	--	3	3.0
	CO6	Assess system performance through testing and optimization to improve cybersecurity and efficiency.	3	--	--		--	--	--	3	3.0
	Average		3							3.0	3.0
Database Management System (MHIMT 115 P)	CO1	Understand the core principles of database management systems, including data modeling, database architecture, and normalization techniques.	--	--	--	3	--	--	--	--	3.0
	CO2	Develop proficiency in using Structured Query Language (SQL) for data definition, manipulation, and querying within MySQL.	--	--	--	3	--	--	--	--	3.0
	CO3	Learn to design and implement databases that are efficient, scalable, and secure, applying best practices in data modeling and normalization.		--		3					
	CO4	Apply theoretical knowledge through practical lab sessions and projects, developing real-world databases and solving complex data management problems.	--	--	--	3	--	--	--	--	3.0
	Average					3.0					3.0
Advanced Web Development (MHIMT 116 P)	CO1	Understanding of advanced web development concepts.	--	--	--	--	--	--	--	3	3.0
	CO2	Gain expertise in modern web technologies and frameworks.	--	--	--	--	--	--	--	3	3.0
	CO3	Develop the ability to build complex, scalable, and secure web applications	--	--	--	--	--	--	--	3	3.0
	Average									3.0	3.0

	Mobile Application Development for Health Care (MHIMT 117 P)	CO1	Understand the fundamentals of mobile application development in the healthcare context	--	--	--	--	--	--	--	3	3.0
		CO2	Gain proficiency in modern mobile development technologies and frameworks.	--	--	--	--	--	--	--	3	3.0
		CO3	Develop the ability to design, implement, test, and deploy secure and effective mHealth applications.	--	--	--	--	--	--	--	3	3.0
		Average									3.0	3.0
	Machine Learning in Health Care (MHIMT 118 P)	CO1	Understand the fundamental concepts and techniques of machine learning.	--	--	--	--	--	--	3	--	3.0
		CO2	Gain proficiency in implementing machine learning algorithms using modern tools and frameworks.	--	--	--	--	--	--	3	--	3.0
		CO3	Learn to train, evaluate and improve machine learning models.	--	--	--	--	--	--	3	--	3.0
		Average								3.0		3.0
	Data Visualization and Reporting in Health Care (MHIMT 119 P)	CO1	Understand the fundamentals of data visualization and reporting in the healthcare context.	--	--	--	--	--	--	3	--	3.0
		CO2	Gain proficiency in using modern data visualization tools and technologies and to learn best practices for data reporting and presentation	--	--	--	--	--	--	3	--	3.0
		CO3	Develop the ability to create clear and effective visualizations that communicate complex healthcare data.	--	--	--	--	--	--	3	--	3.0
		Average								3.0		3.0
Semester 4	**Bioethics, IPR, and Biosafety (MHIMT 120 T)**	**CO1**	Evaluate ethical concerns in biomedical and biotechnological practices.	--	--	--	--	3	--	--	--	3.0
		CO2	Understand different types of IPR and their applications.	--	--	--	--	3	--	--	--	3.0
		CO3	Apply various national and international guidelines in biomedical and health research.	--	--	--	--	3	--	--	--	3.0
		Average						3.0				3.0
	Research Project / Dissertation (MHIMT 114)	CO1	Develop healthcare informatics solutions that align with industry standards and regulatory requirements.	3	--	--	--	--	--	--	3	3.0
		CO2	Evaluate healthcare challenges and design innovative IT-based interventions.	3	--	--	--	--	--	--	3	3.0
		CO3	Implement secure and interoperable health information systems using industry frameworks.	3	--	--	--	--	--	--	3	3.0
		CO4	Demonstrate project management skills to plan, execute, and optimize healthcare IT projects.	3	--	--	--	--	--	--	3	3.0
		CO5	Collaborate effectively with multidisciplinary teams to integrate healthcare and IT expertise.	3	--	--	--	--	--	--	3	3.0
		CO6	Assess system performance through testing and optimization to improve cybersecurity and efficiency.	3	--	--	--	--	--	--	3	3.0
		Average		3.0							3.0	3.0

	Internship (MHIMT 121)	CO1	Develop healthcare informatics solutions that align with industry standards and regulatory requirements.	3	--	--	3	--	--	--	--	3.0
		CO2	Apply health informatics methods to clinical workflows and care processes.	--	--	3	3	--	--	--	--	3.0
		CO3	Understand the practical health IT deliverable that meets local requirements and best industry practices.	3	--	--	--	--	--	--	--	3.0
		CO4	Analyze the data quality, privacy & governance and communicate findings to stakeholders	--	--	3	--	--	--	--	--	3.0
		CO5	Exhibit improved professional skills including communication, teamwork, adaptability, and workplace ethics.	--	--	--	--	3	--	--	--	3.0
		Average		3.0		3.0	3.0	3.0				3.0