MASTER IN INFORMATION SYSTEMS
HEALTH ANALYTICS TRACK

I.   PROGRAM DESCRIPTION

The Master in Information Systems (MIS) is a graduate program intended to prepare students for strategic decision-making skills in the implementation of information systems in any organization. It is a program with a flexible curriculum that supports two unique professional path which is the Data Science Track and Health Analytics Track.

Health Analytics Track Specialization
The health analytics specialization operates at the convergence of IT and health care, where evidence-based medicine, intelligent medical records, and data are leveraged to fuel more efficient, patient-centered health care, and improved population health. Assessing health analytics needs from clinical, technical, operational, and financial perspectives, students gain familiarity with the use of standards, information architecture, standard terminologies, and decision analysis in complex health care organizations. Students develop insights into clinical care processes and how IT impacts patients, health care providers, caregivers, and other key stakeholders in a rapidly evolving health care environment.

II.   COURSE DESCRIPTION

REMEDIAL COURSES

Course Name	MIS003: Concepts and Practice on Clinical Thinking
Course Description	This course focuses on health care data and documentation, develops the basics of clinical reasoning, the use of diagnostic tools, health care quality and error reduction, and the use of data to improve health.
Number of Units	3 units

Course Name	MIS004: Healthcare Organization Operations
Course Description	This course examines the entire information technology needs of every part of health care organization and management, including patient access services, ambulatory care, clinical practice, and organization, nursing services, managing facilities and resources, personnel and staffing. Fundamentals of Health Information Technology including electronic health records, health information exchanges, clinical decision support and foundational healthcare data sources for the providers, patients and payers will be covered.
Number of Units	3 units

IS CORE COURSES (12 Units)

Course Name	MIS101: IS Organization, Management and Administration
Course Description	This course introduces the key challenges and responsibilities of managing information systems and an information systems organization. Students gain knowledge of the various facets of managing information technology including how to develop an IT/IS strategy aligned with business strategy. Topics covered include the IT/IS solution lifecycle, IT/IS service management, IT/IS supplier management and sourcing, ongoing IT/IS technology operations, governance, business continuity, budgeting, benchmarking, and industry standard management frameworks.
Number of Units	3 units

Course Name	MIS102: IT Project and Change Management

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Course Description	This course provides knowledge on the managerial and technical skills that are applicable to information systems software development lifecycle (SDLC) including requirements, analysis/design, implementation, and testing. The student applies the fundamental concepts and techniques of project management like schedule and budget estimation, resource allocation, progress monitoring, risk mitigation and contingency planning to IT projects in the software industry. It includes hands-on experience with traditional project management methodologies and modern project management methodologies like Agile project management. Standards for quality assurance and quality control, like ISO 9000 family of standards, will be discussed and explained to assess the maturity of the development organizations and the development processes for the IT projects. Business Communication and IT budgeting moves projects and innovation forward, focusing on application to real-world initiatives.
Number of Units	3 units

Course Name	**MIS103: Advanced Financial and Managerial Accounting**
Course Description	This course teaches students advanced theory and practice of contemporary accounting issues. The course deals with advanced financial accounting, inter-corporate investments, business combinations, financial statements, foreign currency translation, leases, pensions, and stock options. Advanced managerial accounting, accounting information systems, advanced costing models, activity-based costing, balanced scorecard, and economic value added (EVA) will also be studied.
Number of Units	3 units

Course Name	**MIS104: IS Policy and Strategy**
Course Description	This course introduces effective frameworks and methods for developing information technology and systems strategies that focus on meeting enterprises business objectives and on leveraging IT to competitively extend business capabilities. Topics covered include business driver identification and business and IT alignment; key technology components of the IT strategy, including enterprise architecture, enterprise systems, Service Oriented Architecture and other integration technologies, networks, and data management; portfolio management; sourcing and hosting alternatives; emerging technologies and entrepreneurship.
Number of Units	3 units

IS SPECIALIZATION COMMON COURSES (9 Units)

Course Name	**MIS105: Advanced Enterprise Data Management**
Course Description	This course explores enterprise data systems and sources, taking a holistic approach to knowledge management within organizations. This course will introduce enterprise and management-level information systems that support business processes including enterprise resource planning (ERP), decision support systems (DSS), supply chain management (SCM), knowledge management systems (KMS), customer relationship management (CRM), and human resources information systems (HRIS). Students will explore the impact of the Internet on traditional IT systems management with particular focus on the technical and policy impact personal smart devices and the unique security issues raised by mobile applications, social media, and cloud-based systems. The course will also introduce students to the fundamentals of logical data models and database design.

Number of Units	3 units

Course Name	**MIS106: Advanced Data Analysis and Visualization**
Course Description	Data analysis and visualization is an emerging field concerned with analyzing, modeling, and visualizing complex high dimensional data. This course will introduce state-of-the-art modeling, analysis and visualization techniques. It introduces students to design principles for creating meaningful displays of quantitative and qualitative data to facilitate managerial decision-making. It considers visualization as a component of systems for data science and presents examples of exploratory data analysis, visualizing time, networks, and maps. It reviews methods for static and interactive graphics and introduces tools for building web-browser-based presentations. It will emphasize practical challenges involving complex real-world data and include several case studies and hands-on work with the R/Python programming language, Rapid Miner, Weka and Tableau.
Number of Units	3 units

Course Name	**MIS 107: IS Research Methods**
Course Description	The course provides knowledge about dominant research methods and approaches in the field of Information Systems. It offers a discussion of the basics of scientific research in IS, the debate among the qualitative and the quantitative, a wide range of data collection methods and analysis, foundational research philosophies, design science research in IS, scientific quality and research ethics, and research writing. The aim of the course is to help students in selecting and using research methods and theoretical frameworks in the empirical research process. Knowledge developed in this course is therefore vital for the master capstone project. The course includes lectures, guest lectures by known IS scholars, interactive discussion seminars, and workshops. Activities are based on student group work during which involves student-led lectures and literature summaries as well as writing a final research proposal.
Number of Units	3 units

IS SPECIALIZATION (9 Units)

Course Name	**MISH 201: Advanced Healthcare Data Mining and Predictive Analytics**
Course Description	Healthcare Data Mining and Predictive Analytics provides an in-depth discussion of selected topics of statistical analysis applicable to healthcare data. It is designed to assist graduate students in the application of traditional statistical methodologies to real life healthcare datasets and apply various data mining concepts and algorithms. It emphasizes on classifiers, clustering, and association analysis applicable to the distinct nature of healthcare data.
Number of Units	3 units

Course Name	**MISH 202: Advanced Data Modeling for Health Analytics**
Course Description	This course extends the health analytics conception of predictive modeling with ordinary least-squares regression to the situations of repeated measures, dichotomous responses, and survival times/outcomes. Learners will learn essential topics such as longitudinal data analysis, logistic regression, and survival analyses. Students will explore issues of data preparation, model fit and interpretation, model development strategies, and validation. Students will also model real world healthcare data containing missing values and outliers. This course will provide students with the skills to develop analytical

	features from health datasets. Students will develop an understanding of healthcare data, particularly electronic health record (EHR) data, and use R & SQL to build features for analytical modeling.
Number of Units	3 units

Prescribed course under Special Topics

MISH 203: Health Analytics Leadership

This course is designed as an introduction to health analytics leadership practice, high level project management, customer engagement, and effective communication in health care organizations. Students in analytics-based roles and disciplines will learn organizational strategies for developing and executing a robust Business Intelligence vision and strategic plan. Health care organizations with a strong business intelligence platform enable clinical and business decision making and improve the efficiency of the overall data delivery system. Leadership strategies including data governance fundamentals, elements of the Business Intelligence (BI) maturity model, and key practices to improve organizational data literacy will be examined. The course will also focus on developing effective communication and presentation skills to translate analytics to actionable recommendations that can be used to solve problems in their organizations. Through case scenario exercises, students will deepen their ability to present data analyses and recommendations in a clear and concise manner, evaluate analyses others have done, and articulate the strengths and limitations of their analyses. Students will demonstrate success if they are able to connect and translate their analytics to purpose, process, and people.

MISH 203: Health Data Security, Ethics and Governance

This course provides a working knowledge of the specific considerations for health data and the appropriate application of privacy laws to protect personal health information and maintain confidentiality. This will include oversight of technical, administrative, and physical safeguards needed to maintain a secure environment and minimize the risk of a data breach. Additionally, the course will address ethical concerns and dilemmas in the use and disclosure of health data, such as use in public safety and medical research. Topics include ensuring system specifications and configurations meet regulatory requirements; ensuring cybersecurity risks are mitigated and managing organizational & technical governance.

Course Name	**MIS 204: Capstone 1 IS Project Proposal**
Course Description	The capstone course focuses upon the practice of data science and health analytics. This course is the culmination of the MIS program. It gives students an opportunity to demonstrate their business strategic thinking, communication, and consulting skills. Business cases across various industries and application areas illustrate strategic advantages of analytics, as well as organizational issues in implementing systems for data science and health analytics. Students work in individually generating business plans and project implementation plans focusing on analytics and modelling. Students are expected to come up with a project proposal that needs to be approved by the adviser and the Faculty of MIS program before any subsequent work is started. Approval of proposal does not necessarily mean that the student's work already is an original contribution to knowledge. Any approval at this point means that the students' initial work shows innovative ideas and promise that may lead to that desired significant and original contribution.
Number of Units	3 units

Course Name	**MIS 205: Capstone 2 IS Project Implementation**
Course Description	The capstone course focuses upon the practice of data science and health analytics. This course is the culmination of the MIS program. It gives students an opportunity to demonstrate their business strategic thinking, communication, and consulting skills. Business cases across various industries and application areas illustrate strategic advantages of analytics, as well as organizational issues in implementing systems for data science and health analytics. Students work in individually generating business plans and project implementation plans focusing on analytics and modelling. This course is where refinements to the students' original idea are done and where the actual information systems development takes place. This is the other half of the entire course and therefore the amount of time, energy, and other resources students' need to get the job done is also roughly half the total amount of time required.
Number of Units	3 units