# Master of IT in Business

## Course Description

### Table of Contents

<table>
<thead>
<tr>
<th>COURSE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Banking Processes, IT &amp; Architecture</strong></td>
<td></td>
</tr>
<tr>
<td>A.1 Banking Products &amp; Processes</td>
<td>2</td>
</tr>
<tr>
<td>A.2 Retail Banking Technology &amp; Operations</td>
<td>2</td>
</tr>
<tr>
<td>A.3 Corporate Banking Technology &amp; Operations</td>
<td>2</td>
</tr>
<tr>
<td>A.4 Financial Markets Technology &amp; Operations</td>
<td>2</td>
</tr>
<tr>
<td>A.5 Trading Technology &amp; Operations</td>
<td>3</td>
</tr>
<tr>
<td>A.6 Payment Technology &amp; Operations</td>
<td>3</td>
</tr>
<tr>
<td>A.7 Assets Management Technology &amp; Operations</td>
<td>3</td>
</tr>
<tr>
<td>A.8 Lifecycle Implementation of Banking Products</td>
<td>4</td>
</tr>
<tr>
<td>A.9 FS Operational Risk I: Foundation &amp; Framework</td>
<td>4</td>
</tr>
<tr>
<td>A.10 FS Operational Risk II: Technology, &amp; Systems</td>
<td>4</td>
</tr>
<tr>
<td><strong>B. Analytics Technology &amp; Applications</strong></td>
<td></td>
</tr>
<tr>
<td>B.1 Analytics Framework &amp; Business Context</td>
<td>5</td>
</tr>
<tr>
<td>B.2 Data Analytics Lab</td>
<td>5</td>
</tr>
<tr>
<td>B.3 Customer Analytics &amp; Applications</td>
<td>5</td>
</tr>
<tr>
<td>B.4 Operations Analytics &amp; Applications</td>
<td>5</td>
</tr>
<tr>
<td>B.5 Cloud and Big Data Analytics</td>
<td>6</td>
</tr>
<tr>
<td>B.6 Visual Analytics &amp; Applications</td>
<td>6</td>
</tr>
<tr>
<td>B.7 Text Analytics &amp; Applications</td>
<td>6</td>
</tr>
<tr>
<td>B.8 Social Analytics &amp; Applications</td>
<td>6</td>
</tr>
<tr>
<td>B.9 Mobile Analytics &amp; Applications</td>
<td>6</td>
</tr>
<tr>
<td>B.10 Business Analytics Practicum</td>
<td>6</td>
</tr>
<tr>
<td><strong>C. Information Technology Management</strong></td>
<td></td>
</tr>
<tr>
<td>C.1 Innovation Management</td>
<td>7</td>
</tr>
<tr>
<td>C.2 Spreadsheet Modelling for Technology &amp; Operations Decision</td>
<td>7</td>
</tr>
<tr>
<td>C.3 IT Project &amp; Vendor Management</td>
<td>7</td>
</tr>
<tr>
<td>C.4 Global Sourcing of Technology &amp; Processes</td>
<td>7</td>
</tr>
<tr>
<td><strong>D. General Management</strong></td>
<td></td>
</tr>
<tr>
<td>D.1A Financial Accounting for Financial Services</td>
<td>8</td>
</tr>
<tr>
<td>D.1C Management Accounting for Technology &amp; Operations Managers</td>
<td>8</td>
</tr>
<tr>
<td>D.2 Strategy &amp; Organisation</td>
<td>8</td>
</tr>
<tr>
<td>D.3 Finance for Technology &amp; Operations Managers</td>
<td>9</td>
</tr>
<tr>
<td>D.4 HRM for Technology &amp; Operations Managers</td>
<td>9</td>
</tr>
<tr>
<td><strong>E. Capstone Project</strong></td>
<td></td>
</tr>
<tr>
<td>E.1 Project</td>
<td>9</td>
</tr>
<tr>
<td>E.2 Project Delivery</td>
<td>9</td>
</tr>
</tbody>
</table>
A.1 Banking Products & Processes

Technology and operations professionals need to understand banking products, control requirements, customers' and management's needs in order to design the necessary processes and systems that will lead to superior delivery through various channels and media. Students will learn to view selected retail and wholesale banking products and services from this perspective.

Three aspects to our approach for this course distinguish it from the more commonly found treatments of banking product overviews.

- We define and analyze products in the context of our Unified Banking Process Framework. This makes it possible to link specific examples to an overarching conceptual framework, and provides a consistent approach to understanding products and processes across all segments of banking.
- We have a strong process and data orientation. We look at a product in terms of how it flows from end-to-end through the bank and larger financial system, and in terms of data generation and data management associated with the product.
- We emphasize how the processes and data associated with a product relate to meeting external customers' and internal management's needs.

The course also introduces As-Is and To-Be analysis of banking processes, and provides the required foundation for the other Banking Processes, IT & Architecture series of electives.

A.2 Retail Banking Technology & Operations

Students will view and analyse selected retail banking products and services, and view them from the solutions and architecture perspectives, spanning the front to the back office.

These solutions include core banking, branch platforms and delivery channels such as ATM, internet and mobile banking. The design and flow of different types of consumer payment systems - cheque, debit and credit cards and stored value facilities will be examined. This course does not involve hands-on programming and low-level implementation. Students will gain in-depth knowledge on system and application architecture and functionality, through in-class lectures and walkthroughs and demonstrations provided by vendors. Topics such as customer analytics, security and retail banking technology trends will also be included.

A.3 Corporate Banking Technology & Operations

This course explores corporate and institutional banking (C&IB) and architecture. It begins by reviewing core principles of solution development including systems architecture and business process management. These considerations are then examined in different C&IB business contexts. Specifically, the product areas of cash management, trade finance, corporate treasury and derivatives are covered. The later part of the course examines other types of C&IB solutions, such as customer relationship management, channels, and risk management. Emphasis is placed throughout the course, on analyzing real-world situations using case studies and gaining hands-on experience with banking systems.

A.4 Financial Markets Technology & Operations

This course reviews the technology architectures and solutions that support financial market transactions. The product lifecycle and trading flows for equities, bonds, foreign exchange, futures, and other derivatives are compared. Likewise, the function of and interactions between core trading systems - market data, order routing, position management, clearing and settlement, and risk management - are also analyzed. The course will provide hands-on exercises with trading system technology. It will also explore current issues, such as the design of event-driven architectures and high-performance systems.
A.5 Trading Technology & Operations

Details for the launch dates for A.5 Trading Technology & Operations will be announced later.

A.6 Payment Technology & Operations

Details for the launch dates for A.6 Payment Technology & Operations will be announced later.

A.7 Assets Management Technology & Operations

Details for the launch dates for A.7 Assets Management Technology & Operations will be announced later.

A.8 Lifecycle Implementation of Banking Products

All banking products go through the lifecycle stages of i) product design & set up, ii) customer engagement, iii) customer order acquisition, iv) transaction fulfilment, v) maintenance, vi) reviews, and vii) product wind-down & phase out.

In the other courses in the Banking Processes, IT & Architecture series, we assume the product already exists, and we focus on the various aspects of product execution ranging from ii) customer engagement through to vi) product and customer reviews.

In this course, we look at the complete lifecycle of a banking product, with special emphasis on the design & set up tasks that are required for product creation, as well as on the product wind-down and phase out tasks that are part of product retirement.

The nature and complexity of the processes and requirements for product creation and product retirement can be quite different, depending on the particulars of the type of product and type of customers involved. To give students an overview of this landscape, we look at selected examples across retail banking, wealth management, corporate & institutional banking, and capital markets. For these examples, we examine the processes, data and systems associated with planning, designing and setting up a new product, as well as technology and operational issues related to scaling up and transitioning to steady state execution, and to eventually winding down and retiring the product.

A.9 FS Operational Risk I : Foundation & Framework

Operational risk is risk arising from a financial institution's business functions and from the practical implementation of the management’s strategy. It can be defined as the risk of loss resulting from inadequate or failed internal processes, people, systems and management or from external events.

It is relatively straightforward for an organisation to set and observe specific, measurable levels of market risk and credit risk. In contrast however, it is relatively difficult to identify or assess levels of operational risk and its many sources. Historically, organisations have accepted operational risk as an unavoidable cost of doing business.
The objectives of the course are to enable students to develop and maintain the operational risk management framework, policies and standards with emphasis on how to devise and update a framework based on the key elements like governance, policies, processes and procedures along the what, where, when, how and who dimensions. Students will also learn to develop, implement and maintain operational risk methodologies and tools and create and sustain awareness of operational risk management thought an institution. The course will also cover the relevant legislations, regulations and codes of practice.

A.10 FS Operational Risk II : Data, Information, System & Architecture

Operational Risk is inherent in all banking activities, not only in the business it conducts but also from the fact that it is a business - an employer, owning and occupying property, and holding assets, including information, belonging to itself and its clients. A blogger once remarked, without an operational risk management system, a bank is like driving blind in a blizzard of incidents that increases its potential for losses and diminishes its performance.

Today more than ever, it is vital that a bank's management has the information, tools and answers they need to fulfill their fiduciary duties. No operational risk framework is designed to eliminate risk per se but, rather, to contain it within acceptable levels as determined by senior management. It is therefore absolutely essential to ensure that a bank has sufficient information, in a timely manner, for making informed decisions about additional controls, adjustments to controls, or risk mitigation efforts.

This course examines the information, the knowledge needed in managing operational risk on a bank-wide basis. It focuses on the components of risk infrastructure needed to enable banks to systematically collect, manage and distribute real-time risk content *. The course will look into the data, the models that transformed the data into information, as well as the knowledge needed to interpret and translate information into decision and action. The course will challenge students to think Operational Risk Oriented Architecture that brings together the necessary data, models, processes and solutions.

* Risk content ranges from price data, position/exposure information, alerts from security agency, to business continuity policies, emergency response procedures, control standards, facilities and IT assets, baselines, threats/vulnerabilities.
B. Analytics Technology & Applications

(For AT students: B.1 and B.2 are compulsory; select 3 other B course units)

B.1 Analytics Framework & Business Context

While each service sector has its unique flavour of processes and operations, there are commonalities in most of the business processes of this sector. This course introduces the students to the service industry processes and stakeholders (both internal and external) that are working to meet customer needs. The concept of Unified Service Sector process framework, a framework to manage service sector industry operations, will be introduced and few industry specific frameworks will be examined and expanded as part of the course. Healthcare, Retail, Airport Operations and Telco are the service sector industries that are covered at varying level of detail.

The course will use lectures, class discussions, assignments and external speakers to cover the material and provide introduction to service industry business processes and data management.

B.2 Data Analytics Lab

This course is about data analytics techniques and data-driven business knowledge discovery. It aims to convey the principles, concepts, methods and best practices from both statistics and data mining, with the goal of discovering knowledge and actionable insights from business data. In this course, students will be exposed to a collection of data analytics techniques and gain hands-on experiences in using these techniques. Student will focus their attention on the use and valuation of these techniques and solution to discover new knowledge from data and how to make data-driven decisions in an intelligent and informed manner. You will be also trained to understand the statistics rigour and data requirements of these techniques. Techniques discussed in this course form the foundation of the subsequent courses.

B.3 Customer Analytics & Applications

The goals of this course are for students to (a) develop a strong understanding of the concepts and techniques of customer focused and data driven analytics, and supporting systems and (b) apply that understanding in creating cutting-edge business analytics applications and IT solutions for service industry companies to gain customer insights. This includes using these applications and solutions to analyse customer’s attitudes, behaviour, profitability and risk. This involves topics such as i) customer focused analytical reasoning, ii) methods and applications to support analytic tasks and analytic challenges in specific industry contexts, iii) evaluating and improving the usefulness and usability of data analytics applications. Several case studies on customer focused data analytics and related IT projects are studied. Emerging “next-practices” of real time, adaptive data analytics in the context of customers are explored. Linkages across processes, data, operations, analytics, technology and architecture are highlighted.

B.4 Operations Analytics & Applications

Every service sector business is faced with operations related problems including demand forecasting, inventory management, distribution management, capacity planning, resource allocation, work scheduling, and queue & cycle time management. This course is build on the processes that are learnt in “Service Sector Processes & Data Framework”.

In this course, students will be exposed to the Data and Decision Analytics Framework which helps the analyst identify the actual cause of business operation problems by collecting, preparing, and exploring data to gain business insights, before proposing what objectives and solutions can and should be done to solve the problems. Such a framework combines identification of the root causes by data analytics, and proposing solutions supported by decision analytics.

The objectives of this course are for students to (a) develop a strong understanding of the theory, concepts and techniques of operations management and data driven analytics, and (b) apply that understanding in creating cutting-edge business analytics applications and IT solutions for service industry companies to gain operation insights and business improvements. Students will apply the Data and Decision Analytics Framework to solve several operations focused case studies. This framework is an expansion of a typical operations management solution methodology to include data analytics so as to exploit the linkages across processes, data, operations, analytics and technology, to offer businesses alternative solutions to operations problems.
The data generated by modern society is now growing faster than Moore’s law. Everyday individuals produce a large amount of data through their interactions with the real and virtual world. Behind all of these continually growing volumes of data, businesses hope to learn from them, in the shortest time possible, so as to better understand their customers and thus align their strategies to the needs of the marketplace. As the cost of generating and storing data has quickly fallen, the technology and skills to work with large amounts of data has lagged behind. This course will look at the latest best practices and technology that are emerging to enable professionals to work with large and real-time datasets as easily as they once worked with data that could be analyzed in a single system in a spreadsheet. This course will take a more in-depth look at how to use cloud computing to analyze very large dataset in a cost effective and time-sensitive manner.

The course will use lectures, class discussions, assignments and external speakers to cover the material and provide introduction to cloud computing and massive data analytics.

B.5 Cloud and Big Data Analytics

B.6 Visual Analytics & Applications

Details for the launch dates for B.6 Visual Analytics & Applications will be announced later.

B.7 Text Analytics & Applications

Details for the launch dates for B.7 Text Analytics & Applications will be announced later.

B.8 Social Analytics & Applications

Details for the launch dates for B.8 Social Analytics & Applications will be announced later.

B.9 Mobile Analytics & Applications

Details for the launch dates for B.9 Mobile Analytics & Applications will be announced later.

B.10 Business Analytics Practicum

Bringing real-world complex problems with multiple data analytics perspective together with a sponsoring company (e.g. Accenture, IBM or Oracle) into the class room. The class room environment aims to emulate the exact case with excessive data and ill-defined problem scope. Students will have a chance to hear from the company sponsor to learn about the problem and objective and to propose new initiatives which can help to solve the problem and achieve the desired business objectives.
C.1 Innovation Management

This course will empower the students to use innovation methodologies for identifying innovation opportunities and make them aware of the resulting intellectual property rights related issues.

Distinctive features of the course's pedagogy include: (i) Active learning through individual exploration, discovery and sharing (ii) Harnessing group intelligence through peer-led presentations and discussions (iii) Written assignments that require analysis and synthesis, not just knowledge transfer. (iv) Instructor as "coach on the sidelines" as opposed to "sage on the stage."

Upon completion of the course, students will have gained knowledge related to Innovation Management. Students will also develop their learning-to-learn and collaboration skills, as well as their presentation and writing skills. They will be able to: (a) identify new innovations relevant to their companies (b) prioritize investments into innovation opportunities and evaluate their relative value to their business divisions. (c) translate selected innovation opportunities into project proposals that will fit the IT governance frameworks of their companies (d) identify the needs and means of intellectual property protection for the innovations (e) position business IT proposals for successful adoption by their companies.

C.2 Spreadsheet Modelling for Technology & Operations Decisions

Very often, managers need to quickly make important decisions related to managing IT investments, assets, operations and projects. Understanding how to analyze trade-offs between alternatives is difficult to do without a good model. This course focuses on using Microsoft Excel as a spreadsheet tool to build such decision models and to perform business analysis. Students will be able to analyze trade-offs and understand the sensitivity impact of uncertainties and risk. The key emphasis of this course is on developing the art and intuition of modeling, more so than just learning about the long list of available models, in the context of managing IT resources and operations.

C.3 IT Project & Vendor Management

IT projects never go according to plan and project managers must exercise good judgment and effective management skill to ensure success. Students will learn of the many decisions and tradeoffs that project managers make daily, namely managing schedules, team dynamics, resource scheduling, quality issues, schedule delays, cost overruns, to name a few. Students will be introduced to best practices promoted by Project Management Institute (PMI) and documented in "A Guide to the Project Management Body of Knowledge" (PMBOK® Guide).

Case studies of real world IT projects, computer-based simulation games and role playing negotiation exercises will be used in class to help students understand and practice project management skills of managing conflicts, responding to unexpected project problems and negotiating a win-win contract agreements between client and vendor.

IT projects inevitably involve vendors, and increasingly IT operations and IT infrastructures are outsourced to third-party service providers. The ability to manage vendors and negotiate favorable contract terms are essential skills for project managers. Determining when to use and how to select a vendor effectively can make or break even the most carefully planned projects. Students will learn and practise activities that are essential to effective vendor management.
C.4 Global Sourcing of Technology & Processes

Standardising business processes, advances in information and communication technologies, and the continuous improvement of the capabilities of IT service providers around the world, among other factors, have led to an intense impetus to “strategise” IT sourcing. In this course we will investigate how enterprise IT services are (out/in) sourced in the financial services industry. We will also draw relevant examples and lessons learnt from other industries.

Students will develop an understanding of the core issues involved in a variety of sourcing strategies (out/in/co-sourcing), the industry best practices in managing IT sourcing (through case-studies and guest lectures), and the emerging governance schemes for IT sourcing. The other side of sourcing will be analysed, that is, the vendor’s perspectives on managing sourcing relationships and how they deliver their promise of low-cost and high-quality services. Students will have the opportunity to practise forming sourcing decisions - writing Request For Proposals (RFPs), bidding on RFPs, designing contracts, and the like.

D. General Management for Technology & Operations

D.1A Financial Accounting for Financial Services

The course aims to equip students with basic knowledge of accounting basics and the ability to better understand a set of financial statements. The course covers issues such as accrual versus cash systems of accounting, measurement difficulties, and timing judgment involved with assets, liabilities, revenues and expenses amongst others. Equipped with the language of business and students will hence enhance their communications with the finance people and will be able to justify project implementation on the basis of cost-benefits analysis as well as discounting the cash flows.

The course also provide students with the essential skills needed to improve analytical skills through problem solving using accounting information such as fixed versus variable costs and the use of this distinction to conduct a Cost-Volume-Profit (CVP) Analysis. Students are also required to understand relevant costs for decisions such as make versus buy and segment analysis. The course will also introduce students to costing systems, performance measures, cost allocation, planning and performance budgets, and how these accounting tools help organisations to be more effective.

This is a half module delivered once a week over 7 weeks.

D.1C Management Accounting for Technology & Operations Managers

This course helps students understand why management accounting is important for daily business decision, and how managers can use management accounting to plan, evaluate and control operations of organisations. It also aims to provide appropriate management accounting knowledge for IT and operations specialists in the financial and service sectors.

Students are required to link class learning to their work experience and share it with their cohort. Through interactive contributions from all participants, all students should increase their understanding and exposure of management accounting practices and their potential impacts on individual and company performances.

This is a half module delivered once a week over 7 weeks.
D.2 Strategy & Organisation

This course is designed to help students understand how the development of strategies and the organizational changes and leadership necessary to create competitive success. A key aspect of strategic success is execution, without which ideas remain only ideas and not vehicles for value creation. The topics of execution by way of the organization, management and change leadership will be discussed in detail. Lectures, case studies, readings, simulations, tools and their practical use, as well as class participation will be the primary vehicle to create the appropriate learning environment. The outcome of this course will be an effective theoretical and practical understanding by the students of strategic analysis, formulation, execution, and the role and practice of leadership, management and organization.

D.3 Finance for Technology & Operations Managers

Students will be exposed to key financial concepts and tools commonly used by managers in making sound financial decisions. These include ratio analysis, time value of money, risk-return trade-off analysis, capital budgeting, stocks, bonds, and option pricing. In addition, the course also covers the terminology, characteristics and features of various financial instruments transacted in the financial services industry. This helps the students interact effectively with the finance professionals in the different product areas.

D.4 HRM for Technology & Operations Managers

The aim of this module is to allow students to understand the importance of soft skills that must go hand in hand with technical competencies. Given the reality of globalization, this course attempts to highlight key areas that embraces the dynamics of self-management and working with others. Hence, the coverage spans over a broad range of topics designed to meet the HRM needs at the workplace. The course aims to enhance the building of knowledge and relevant soft skills through seminars and the use of case studies, articles and self-assessment tools in order to develop personal and professional skills in working with others. The course is also intended to be interactive so as to foster a learning environment that facilitates creative thinking in the process of peer learning.

This is a half module delivered once a week over 7 weeks.

E. Capstone Project
(equivalent to 2 course units)

E.1 Project

- Project Definition, development and critique workshops
- Industry expert seminars and company site visits

E. 2 Project Delivery

Students must complete a Capstone Project sponsored by an industry partner as partial fulfillment of the MITB (Financial Services) Programme. The project will enable the students to apply and integrate what they have learnt and give them an opportunity to delve in greater depth, into one or more of the topics covered in the courses.
Students work on the projects individually, in collaboration with a sponsoring company, under the supervision of an SMU appointed advisor. In cases where the project scope is large enough to allow for the involvement of more than one student, two may work on the project provided each student makes a distinct contribution towards the project. Each student is expected to commit at least 182 hours on the project, including meeting time with the company and SMU advisors.

Students may be expected to work on-site at the sponsoring company if necessary, to understand the business domain, problem definition and even to gain access to systems, documents and resources available at the company. Students may be paid a sum of money by the sponsoring company at the discretion of the company.