



澳門旅遊學院  
INSTITUTO DE FORMAÇÃO TURÍSTICA DE MACAU  
Macao Institute for Tourism Studies

# Master of Science (MSc) in Smart Technologies in Hospitality and Tourism

## Programme Description

The Master of Science (MSc) in Smart Technologies in Hospitality and Tourism focuses on the core areas of technology and interrelated areas of management. The core areas include robotic applications, artificial intelligence-based internet of things (AIoT), business analytics, sustainable design in cities, and environmental technologies. The interrelated areas of management are financial feasibility, adoption/project planning and implementation details of technologies. The programmes are designed to prepare graduates to advance their career in the hospitality and tourism industry, in the context of smart technology and business analytics.

## Programme Aims

The programme aims to provide higher education with an emphasis on knowledge delivery about state-of-the-art technologies applicable in the hospitality and tourism industry. It is hoped that the programme equips graduates with a computational mind and technological skills to work in a technology-enabled and data-driven industry environment.

## Programme Highlights

- ✓ Provide technology-based education that is interdisciplinary and responsive to new developments in the field.
- ✓ Equip students with technical knowledge and skills required to upkeep and upgrade the technological level of the hospitality and tourism industry.
- ✓ Develop students into professionals capable of contributing to the efficient and sustainable development of hospitality and tourism through the use of new technologies.

# Courses

Course Category	Postgraduate Diploma Programme (PgD) (Total: 21 credits)	Master's Degree Programme (MSc) (Total: 36 credits)
<b>Immersion (3 credits)</b> - Preparatory Course on Technologies - Technical Visit	✓	✓
<b>Technology (3 credits / course, total: 18 credits)</b> - Data Analytics and Visualization - AIoT and Robotics - Technologies for Environmental Sustainability - Geographic Information Systems - Smart Destination and Sustainable Tourism Development - Smart Marketing	Any 5 courses (15 credits)	✓
<b>Business and Management (3 credits / course, total: 6 credits)</b> - Strategic Management - Research Methods		✓
<b>Elective (3 credits / course)</b> - Big Data Analysis - Seminar in Emerging Technologies - Finance and Accounting	1 course (3 credits)	
<b>Dissertation (6 credits)</b>	✗	✓

## Remarks:

- Undergraduate business or hospitality degree holders without strong computer science or IT background are also welcomed to apply.
- Some course materials may be co-delivered by a third-party collaborator whereas IFTM assumes the primary responsibility of its teaching quality and excellence.

## Master of Science (MSc )/ Postgraduate Diploma (PgD) Programme in Smart Technologies in Hospitality and Tourism

Module	Course Title	Course Description
Immersion (3 credits)	Preparatory Course on Technologies (2 credits)	Business analytics is a fast-changing field. Its methodology and application tend to improve continually. This course aims at introducing fundamental skills required for analytical studies in this programme, thus suitable for students from different background. With the support of online studying platforms, students will learn state-of-the-art data skills under the guidance of the instructor.
	Technical Visit (1 credit)	This course provides technical visits for students to Information Technology-oriented organisations, trade shows, exhibitions, or hospitality and tourism properties within the context of business analytics and technological applications. This activity encourages students to understand and examine the best practices of business analytics and technologies in different sectors and germinate ideas for their dissertation.

Module	Course Title	Course Description
Technology (18 credits)	Data Analytics and Visualization (3 credits)	In this course, students will learn fundamental techniques to collect and process data from different sources, apply suitable analytic methods, and to finally decode and describe the hidden meanings behind the data with an optimum presentation format to tackle different issues. Topics include visualisation tools such as Tableau Software.
	AIoT and Robotics (3 credits)	<p>Hospitality industry is often a "boot camp" for introducing new technologies to revolutionize its operations. Hotel properties are often innovative labs for new technologies. This course aims at introducing the principle of AI with Internet of Things (AIoT) and Robotics. In addition, practical robotics case studies and solutions will be reviewed. Students will gain experience in designing and deploying smart technologies in this fast-changing industry and generate new ideas for hotels.</p> <p>Topics include: introduction to AI and Internet of Things, overview of sensor technology, operational studies in hospitality and tourism management based on AI and robotics, case studies, and examples.</p>
	Technologies for Environmental Sustainability (3 credits)	<p>Following the green movement in the hospitality industry, this course aims to discuss environmental technologies that are currently or likely to be applied in the hotel and tourism settings. The content embodies three main aspects including management of technologies, engineering and innovation. Relevant case studies are used as illustrative and reference materials in the knowledge delivery.</p> <p>Topics include: clean air technologies, energy efficient and saving facilities, renewable energy technologies, water saving and cleaning technologies, solid waste</p>

		management and technologies, environmental management systems, Part E of ESG (Environmental, Social and Governance) report and internal green guide.
	Geographic Information Systems (3 credits)	This course is designed to familiarise students with the fundamentals of geographic information system (GIS) and how geodata can be applied to solve local and regional problems, where “locations” matter the most. Major topics include computer representation of geodata, the creation and maintenance of GIS databases, spatial analysis, and presentation of data outputs on digital maps. Case studies, management implications, and relevant GIS research papers are also discussed to complement the practical use of GIS applications.
	Smart Destination and Sustainable Tourism Development (3 credits)	Smart Destination is a local system characterised by advanced services, a high degree of innovation through a considerable use of ICTs and the presence of open, multipolar, integrated and shared processes directed at enhancing the quality of life for both residents and tourists. This course is designed to introduce the topic of smart approach in tourism destinations and to opportunities offered by a rapid diffusion of smart technology for sustainable development. Based on the four pillars of sustainability: economic, social, cultural and environmental, the course discusses the utilisation of smart technologies to improve the quality of life and facilitate friendly interactions between people, organisations and the city itself.
	Smart Marketing (3 credits)	This course reviews the role of traditional marketing channels, its relationship with smart technologies, and the shift to a next-generation marketing mindset driven by information technology. The course also teaches practical skills to undertake a digital transformation in marketing. After this course, students will be able to address different marketing needs with digital means.

Module	Course Title	Course Description
Elective (3 credits, choose one of the courses)	Big Data Analysis (3 credits)	While conventional technologies provide users the ease of handling structured data, it is also important to develop a competence in understanding and making use of unstructured data to stay ahead of the competition. This course introduces the fundamentals of data analysis in a big data spectrum. Through collaborating with major CSPs (Cloud Service Providers), students will gain practical cloud-based big data analytics experience. Upon completion, students may consider participating in optional exams for additional certifications in the big data analysis field.
	Seminar in Emerging Technologies (3 credits)	Different types of technologies have proliferated the tourism and hospitality landscape. This course aims to deliver knowledge and skills relevant to emerging technologies and share insights on early applications of different technologies, relevant case studies, challenges and legal and governance issues related to information and communication technologies. The course will also cover marketing, innovation and communication as well as the related theories.
	Finance and Accounting (3 credits)	This course helps students understand the principles of financial and efficiency analysis, and demonstrates their importance in management decision-making for hospitality and tourism businesses. The course will enable students to apply accounting approaches and analyses in making decisions to procure technologies and assess their performance. Students will also be able to understand, analyse, and interpret financial information to aid management decisions. The concepts of conventional and green finance will be covered.

Module	Course Title	Course Description
Business and Management (6 credits)	Strategic Management (3 credits)	This course provides an opportunity for managers of hospitality and tourism companies to understand, apply, develop, and evaluate critically business strategies. It also offers an understanding and critical evaluation of the factors that contribute to successful strategic management. Common strategies in the hospitality and tourism industry are embedded in the course content. Businesses will be invited to showcase real-life strategies and co-develop solutions.
	Research Methods (3 credits)	This course aims to develop students' intermediate levels of knowledge and skills that enable them to apply different methods of research to address broad real-life management problems and in specific contexts of hospitality and tourism. At the end of the course, students will be expected to have obtained the necessary knowledge and confidence in applying the most established research methodologies, following the basic framework of identifying research problems, formulating appropriate research design, conducting scientific data collection and analysis, as well as interpreting, presenting, and communicating research findings.

Module	Course Title	Course Description
Capstone Module (6 credits)	Dissertation (6 credits)	The course is conducted using an integrated project-based learning approach. Students work on an individual project selected or proposed in a specific area of the programme. An academic and/or industry supervisor is assigned to guide and monitor the progress of the project. In other words, the students have the possibility, in consultation with their faculty supervisor, to work together with an external industry partner. Dissertations are classified into different types according to the methodologies employed: industry projects, case writing (company analysis), empirical research, creative work (innovation) and others.