Integrated Coastal Management

Course Modules for BS and MS in Marine Sciences
What is Integrated Coastal Zone Management?

- ‘Integrated Coastal Zone Management (ICZM) is a dynamic, multidisciplinary and iterative process to promote sustainable management of coastal zones. It covers the full cycle of information collection, planning (in its broadest sense), decision-making, management and monitoring of implementation’ (The European Commission).

- ‘ICM is a planning and coordinating process which deals with the development management and coastal resources and which is focused on the land/water interface’ (Clark, 1992). This means integration of all relevant policies, sectors, and levels of administration.

- The ICM process seeks inputs from all stakeholders to establish policies for equitable allocation of space and resources in coastal zones and an appropriate governance structure for decision-making and oversight.

ICM, a Curriculum Module of Marine Science

The MS in Integrated Coastal Management (ICM) seeks to provide graduate students with advanced training in techniques that explore mechanisms to maintain the functional integrity of coastal resource systems and to reduce resource-use conflicts, maintain the health of the environment and facilitate multi-sectoral development progress in the coastal zones of Pakistan.

The overarching objective of the ICM module is to support both BS and MS degree programs and to train students in:

- Acquiring knowledge of the physical and biological components of coastal and marine socio-ecological systems and their linkages, in addition to ecosystem structure, functions, and services for human well-being.

- Assessing the ecological, economic and social challenges for sustainable development in coastal and marine environments in relation to human interventions and natural causes including coastal impacts, resilience to climate change and disaster risk reduction.

- Obtaining a clear understanding of the principles, tools and strategies to be adopted in the ICM process in a practical manner.
- Possessing technical skills to provide leadership in ICM
- Understanding ICM national and international policies and regulations, and sustainable management of Marine Protected Areas
- NGOs working on integrated development of coastal communities and natural resource management
- Private sector institutions involved in sectors such as industry, power, energy, food, and tourism.

### Careers in ICM Field
The ICM course will equip students with a solid foundation in integrated coastal management. Course graduates will be able to secure employment in:
- Government agencies involved in development, management and/or regulation of activities related to the coastal zone

### ICM Course Modules Contents
The ICM module is one of eight Major Elective Modules in the curriculum of Marine Sciences that students can opt to enroll in during the 7th and 8th semesters. The ICM module consists of 11 courses.
MS-ICZM – 601: Basic Principles and Scope of ICM
Defines ICM and the common terminology used when discussing ICM principles and approaches. Aims to explain the scope and functions of ICM and the typical actions relating to each function, and helps students understand the principles of good governance and sustainable development.

MS-ICZM – 602: Coastal Ecosystem and Climate Change
Explores how the predicted changes in climate during the present century may affect coastal ecosystems and examines the likely impacts of climate change on mangroves and corals. Aims to help students understand the basic concepts of climate change and resilience.
MS-ICZM – 603: Coastal Resilience and Disaster Risk Reduction
Develops understanding of the concepts and components of resilience by providing conceptual frameworks for managing socio-ecological systems. This will also help students to understand the basic concepts of disasters and disaster risk reduction, in addition to identifying a myriad of ecosystem-based tools that help reduce disaster risk while fostering climate change adaptation.

MS-ICZM – 604: Coastal Tourism Management
Explores the opportunities and threats of coastal tourism development on coastal ecosystems and local communities and how these can be managed using tried and tested tools and the ICM approach.

MS-ICZM – 605: Coastal Zone Management
Increases understanding of coastal zones and the dynamic environments shaped by natural forces and human intervention. Enables students to develop management strategies and identify threats to these environments.

MS-ICZM – 606: Marine Protected Areas Management
Introduces the concept of Marine Protected Areas (MPA) management, as applied to marine biodiversity conservation, fisheries management, and sustainable tourism. Enables students to apply the concept of coastal use zonation and MPA management through a case study exercise on Mafia Island.

MS-ICZM – 607: Marine Spatial Planning & Conflict Management
Introduces coastal and marine spatial planning (MSP) as a tool/planning approach for ICM. The course explores the nature of conflict and the principles of/and approaches to conflict resolution as part of conflict management and examines the nature of dispute resolution processes and practices, in addition to understanding the rational for conflict resolution in ICM.

MS-ICZM – 608: National Policies and International Conventions
Explains the concept of governance; reviews the institutional arrangements and relevant agencies responsible for coastal and marine resource management in Pakistan; reviews the national legal framework, policies and regulations used to manage coastal and marine resources; reviews the international conventions ratified by Pakistan that support and necessitate sustainable coastal resource management.

MS-ICZM – 609: Social Empowerment and Gender Equality
Develops understanding of key gender concepts in relation to sustainable development and the environment and a basic understanding of the concept and methodology of gender integrated planning. The course also explores the linkages between environmental sustainability and the Human Rights Based Approach (HRBA).

MS-ICZM – 610: Socio-Ecological Fundamentals of Coastal Zones
Consolidates the understanding of terminology used in key ecological processes of high relevance and application in integrated coastal management. The course will identify and categorize the role and functions of natural ecosystems and the services they provide, and help understand how human impacts on ecosystems can change the status and value of these services.
MS-ICZM – 611: The ICM Cycle
Describes the ICM process or cycle, and explains each of the five main stages in the ICM implementation cycle i.e. situation analysis and issue identification; program/project planning design; accepting and resourcing the plan; implementation; and learning and evaluation.

BS & MS in Marine Sciences

This module seeks to equip students with the skills to maintain the functional integrity of coastal resource systems, reduce resource-use conflicts, maintain the health of the environment and facilitate progress of multi-sectoral development in the coastal zone of Pakistan.

ICM is a challenging task as it seeks to integrate management efforts across diverse ecosystems and habitats and across a multitude of land-based and water-based human activities.

ICM calls for a new cadre of dynamic professionals

About Mangroves for the Future
Mangroves for the Future (MFF) is a partnership-based regional initiative which promotes investment in coastal ecosystem conservation for sustainable development. MFF focuses on the role that healthy, well-managed coastal ecosystems play in building the resilience of ecosystem-dependent coastal communities in Bangladesh, Cambodia, India, Indonesia, Maldive, Myanmar, Pakistan, Seychelles, Sri Lanka, Thailand and Viet Nam. The initiative uses mangroves as a flagship ecosystem, but MFF is inclusive of all types of coastal ecosystem, such as coral reefs, estuaries, lagoons, sandy beaches, sea grasses and wetlands. MFF is co-chaired by IUCN and UNDP, and is funded by Danida, Norad, Sida and the Royal Norwegian Embassy in Thailand.

Learn more at: www.mangrovesforthefuture.org