

Course Outlines for International Marine Summer School

Outline Timetable and Description of Activities

Each course within the summer school has capacity for 24 students. Given that the vessel accommodates 12 passengers in total, students will undertake 2 days of field work at sea during each course. Training surveys will take place in waters south of Cork and in Galway Bay west of the Aran Islands.

The course in Cork will provide Personal Sea-survival Training (PST STCW95) in the NMCI's indoor environmental pool on the first two days after the introduction to the course, and prior to the students undertaking activities on the ship. The two-day ship-based training component at Cork focuses on a combination of biological, geophysical and geological sampling in a working harbour setting, and on the sea bottom off the south coast including profiling the wreck of the RMS Lusitania.

The two days in Galway Bay focus on oceanographic, benthic, marine ecology, geosciences and fisheries biology. Over the two days of the survey, each group of students will map the seabed and underlying geology, perform geotechnical investigations of sediments (cores and grabs), sample and identify benthic organisms, as well as investigating and determining local oceanographic processes. In combination students will gain the practical, cross disciplinary skills involved in sample acquisition and processing, deployment and operation of equipment and instrumentation and data acquisition.

An outline of the survey areas for both courses are shown in Figures 1 a and b, and Figure 2 respectively.

Please note that students who elect to do only the Galway course will receive an onboard safety briefing by the RV Celtic Voyager's Chief Officer as standard. While the Personal Sea-survival Techniques Training course (PST) in Cork does provide the certification (STCW 95) required to work offshore on Global research vessels it is not required for day trips on the IMSS research vessel.

Outline Timetables

Course 1 : UCC EV3011: The Marine Environment and its Sustainable Use. June 14TH to June 27th Cork

Day 1 (shore-based). Welcome, orientation and introductory lectures

Welcome and housekeeping matters outlined, scope and design of course explained

Introduction to project work on:

- marine management and marine spatial planning
- ecosystem based fisheries management and aquaculture
- benthic ecology, disturbance and recovery
- hydrographic surveying and marine environmental survey
- maritime activities in Cork Harbour and region
- Marine Spatial Planning in Cork Harbour. Concept, data collection needs

Workshop to design a marine survey to collect data pertinent to the implementation of a hypothetical marine spatial plan for proposed Cork Harbour activities

Day 2 (shore-based). Personal Safety Training & 360 degree ship bridge simulator exercises

Students split in 2 groups

Group A – undertake STCW95 Personal Safety Training including lecture based material and realistic practical exercise in the training pool with weather simulation (rain, wind, wave, and lightning)

Group B – instruction and use of the 360 degree ship bridge simulator for practical demonstration and exercises

Day 3 (shore-based). Personal Safety Training & 360 degree ship bridge simulator exercises

Students remain in 2 groups and take alternate training exercises

Group A – instruction and use the 360 degree ship bridge simulator for practical demonstration and exercises

Group B – undertaken STCW95 Personal Safety Training including lecture based material and realistic practical exercise in the training pool with weather simulation (rain, wind, wave, and lightning)

Day 4 (on-board survey & shore-based). Marine Survey in Cork Harbour and Ocean energy workshop

Students remain in 2 groups

Group A – Mobilise in Cork City for Marine Survey of Cork Harbour

- Welcome and Vessel orientation
- Safety familiarisation briefing and Bridge Tour
- Background to Research Vessel Activities and Capabilities
- Review of Survey Design and Planning presentation and discussion
- Vessel will move down estuary from the City to the Harbour mouth and back collecting data at a number of stations for subsequent analysis and work-up. Datasets include echosounder data (single and multibeam), 3.5 kHz sub-bottom profiler data, benthic trawls, sediment samples and benthic biological box-cores,
- During the day short theoretical sessions in geophysics, benthic ecology and fisheries will be conducted.
- Practical instruction and training in oceanography, geophysics, benthic ecology and fisheries biology data collection will be given.
- Group demobilises in Cork City

Group B – *Work shop and lectures on ocean energy, governance, and spatial planning.*

Day 5 (on-board survey & shore-based). Marine Survey in Cork Harbour and data work-up exercises

Students remain in 2 groups

Group A – Practical laboratory work-up of datasets collecting during previous day's surveying

- Geophysical data processing and GIS construction
- Sediment analysis

Group B – Mobilise in Cork City for Marine Survey of Cork Harbour

- **Welcome and Vessel orientation**
- **Safety familiarisation briefing and Bridge Tour**
- **Background to Research Vessel Activities and Capabilities**
- **Review of Survey Design and Planning presentation and discussion**
- **Vessel will move down estuary from the City to the Harbour mouth and back collecting data at a number of stations for subsequent analysis and work-up. Datasets include echosounder data (single and multibeam), 3.5 kHz sub-bottom profiler data, benthic trawls, sediment samples and benthic biological box-cores,**
- **During the day short theoretical sessions in geophysics, benthic ecology and fisheries will be conducted.**
- **Practical instruction and training in oceanography, geophysics, benthic ecology and fisheries biology data collection will be given.**
- **Group demobilises in Cork City**

Day 6 (on-board survey & shore-based). Marine Survey in South Coast and data work-up exercises

Students remain in 2 groups

Group A – Mobilise in Cobh for Marine Survey of South Coast

- **Review of Survey Design and Planning presentation and discussion**
- **Vessel will move from Cobh to Outer Cork Harbour to continue collecting data at a number of stations for subsequent analysis and work-up. Datasets include echosounder data (single and multibeam), 3.5 kHz sub-bottom profiler data, benthic trawls, sediment samples and benthic biological box-cores in outer Cork Harbour**
- **Vessel transits to the wreck of the RMS Lusitania. On-route training will be given and data collection for mammal, cetacean and seabird surveys.**
- **Multibeam imaging of the wreck of the RMS Lusitania and talk on historical importance to British/European/Irish history**
- **During the day short theoretical sessions in geophysics, benthic ecology and fisheries will be conducted.**
- **Practical instruction and training in oceanography, geophysics, benthic ecology and fisheries biology data collection will be given.**
- **Group demobilises in Kinsale. Bus back to Cork.**

Group B – Practical laboratory work-up of datasets collecting during previous day's surveying

- Geophysical data processing and GIS construction
- Sediment analysis

Day 7 (on-board survey & shore-based). Marine Survey in South Coast and Ocean energy workshop

Students remain in 2 groups

Group A – Work shop and lectures on ocean energy, governance, and spatial planning.

Group B – Mobilise in Kinsale for Marine Survey of South Coast

- **Review of Survey Design and Planning presentation and discussion**
- **Multibeam imaging of the wreck of the RMS Lusitania and talk on historical importance to British/European/Irish history**
- **Vessel transits to the Cork Outer Harbour. On-route training will be given and data collection for mammal, cetacean and seabird surveys.**
- **Review of Survey Design and Planning presentation and discussion**
- **Vessel arrives at Outer Cork Harbour to continue collecting data at a number of stations for subsequent analysis and work-up. Datasets include echosounder data (single and multibeam), 3.5 kHz sub-bottom profiler data, benthic trawls, sediment samples and benthic biological box-cores in outer Cork Harbour**
- **During the day short theoretical sessions in geophysics, benthic ecology and fisheries will be conducted.**
- **Practical instruction and training in oceanography, geophysics, benthic ecology and fisheries biology data collection will be given.**
- **Group demobilises in Cobh. Bus to Cork.**

Day 8 & 9 (shore-based). Marine Survey data work-up

Students combined back into one group

Practical laboratory work-up of all datasets collecting during survey days including benthic biology fisheries, mammal, cetacean and seabird datasets

Day 10 & 11 (shore-based). Unsupervised study

Students remain in one group

Students analyse datasets, interpret and write their written report and recommendations

Day 12 (shore-based). Tour of aquaculture operations on the south coast

Students remain in one group

Bus to south coast aquaculture operations to view seaweeds, mussel and salmon farms and processing operations on a visit to Bantry Bay. Lectures and discussions on site.

Day 13 (shore-based). Maritime history, shipping and society

Students remain in one group

Includes a visit to Spike Island former fortress, talks on the Titanic, Irish emigration from Cobh, the modern harbour, Cork City history and trade, and Blarney Castle

Day 14 (shore-based). Course Assessments

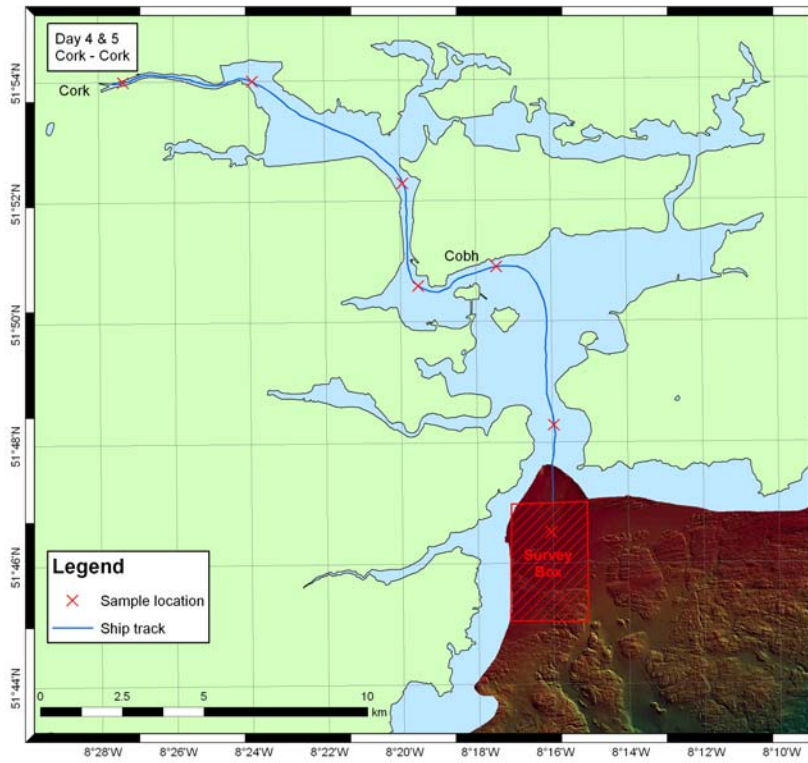
Students remain in one group

- **Hand in of marine survey data report and synthesis**
- **Notebook assessment and feedback**
- **Multiple choice questionnaire**
- **Short summary oral presentations and farewell.**

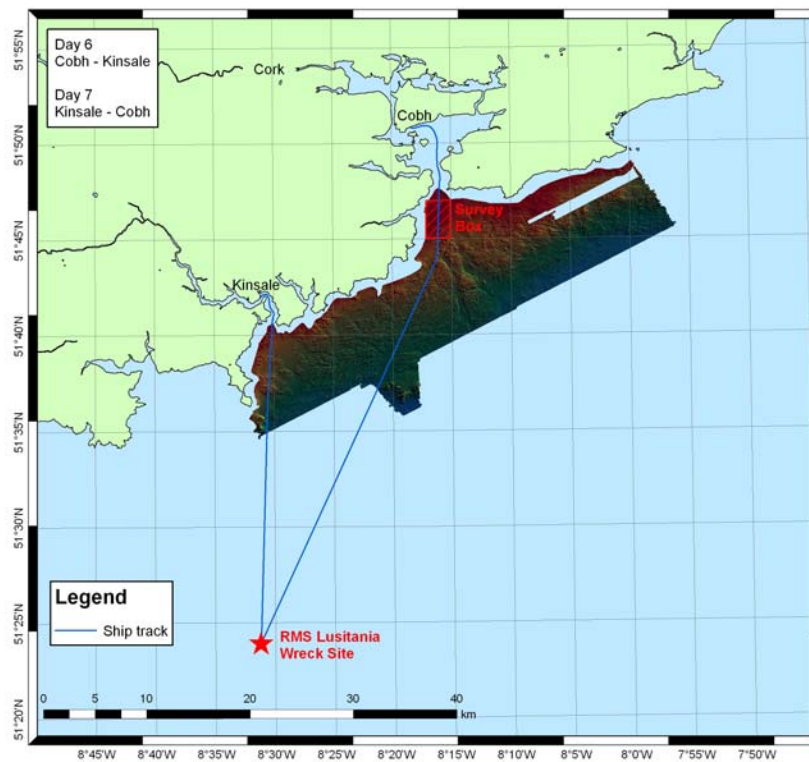
Day 15. Bus transfer to Galway.

Fig 1. Sampling cruise a) days 4 and 5 and b) days 6 and 7.

a)



b)



Course 2: National University of Ireland, Galway: SU416 Galway Bay's Atlantic Margin: Marine, Earth Science and Cultural Perspectives.
June 29th to July 12th Galway

Introductory Lectures and Field Trips		
Date	Activities	Lecturers
Day 1 29/6/2012	<p>Welcome and Introductory Lectures</p> <ol style="list-style-type: none"> 1. Welcome and Introduction to the Galway bay Summer School 2. Geological History of Galway Bay and its Islands 3. Marine Science of Galway Bay 4. The Seashore Geocology of Galway Bay 5. Archaeological and socio-economic perspectives of the Galway Bay area 	<p>Martin Feely, Martin White</p> <p>Martin Feely</p> <p>Martin White, Rachel Cave</p> <p>Liam Morrison</p> <p>Michael Gibbons</p>
Fieldtrip Day 2 30/6/2012	<i>The Geology of Connemara: the story behind the scenery</i>	Martin Feely
Fieldtrips Day 3 & 4 1/7/2012 & 2/7/2012	<p><i>The Burren Adventure: Flora, fauna, archaeology and geology of the Burren region.</i></p> <p><i>Cliffs of Moher and Ailwee Cave</i></p>	Ronan Hennessy
Day5 3/7/2012	<p>Lecture Series 2</p> <ol style="list-style-type: none"> 1. 8000 years of Maritime History of the Bay Area. 2 Aquaculture Research and Development in the west of Ireland 3. Living landscapes: Irish poetry, music and literature of the Bay area 	<p>Michael Gibbons</p> <p>Richard Fitzgerald</p> <p>Nicholas Allen</p>
Fieldtrip Day 6 4/7/2012	<i>Aran islands: Inishmore and its early Christian settlements and maritime history</i>	Michael Gibbons

Field Trips and Days at Sea			
Date	Activities		Lecturers
	Group A	Group B	
<i>Day 7 5/7/2012</i>	<i>Seashore Geoecology of Galway Bay</i>	<i>Survey at Sea Day 1: Onboard etiquette & health & safety, Introduction to multidisciplinary marine sciences, Corrib Plume Survey</i>	<i>Group A: Liam Morrison Group B: Rachel Cave, Martin White</i>
<i>Day 8 6/7/2012</i>	<i>Aquaculture at Carna marine research station; Roundstone's Tombolo and coral beaches</i>	<i>Survey at Sea Day 2 Multidisciplinary Survey of Galway Bay incl. seabed mapping, sediment, benthic & water sampling, coring and current profiling</i>	<i>Group A: Martin Feely, Liam Morrison Group B: Rachel Cave, Martin White</i>
<i>Day 9 7/7/2012</i>	<i>Survey at Sea Day 1: Onboard etiquette & health & safety, Introduction to multidisciplinary marine sciences, Corrib Plume Survey</i>	<i>Seashore Geoecology of Galway Bay</i>	<i>Group A: Rachel Cave, Martin White Group B: Liam Morrison</i>
<i>Day 10 8/7/2012</i>	<i>Survey at Sea Day 2 Multidisciplinary Survey of Galway Bay incl. seabed mapping, sediment, benthic & water sampling, coring and current profiling</i>	<i>Aquaculture at Carna marine research station; Roundstone's Tombolo and coral beaches</i>	<i>Group A : Rachel Cave, Martin White Group B: Martin Feely, Liam Morrison</i>

Final Field Trip, Data Analysis, Study Session, Assessment and Farewell Reception		
Date	Activities	Lecturers
Fieldtrip Day 11 9/7/2012	8000 years of Maritime History: Visits to a number of archaeological sites steeped in maritime history	Michael Gibbons
Day 12 10/7/2012	Analysis of marine samples and discussion of results	Martin White, Rachel Cave
Day 13 11/7/2012	Study sessions at NUIG	
Day 14 12/7/2012	Course assessment activities Farewell Reception	

Fig 2: Galway Bay and surrounding areas, course location for: SU416 Galway Bay's Atlantic Margin: Marine, Earth Science and Cultural Perspectives

