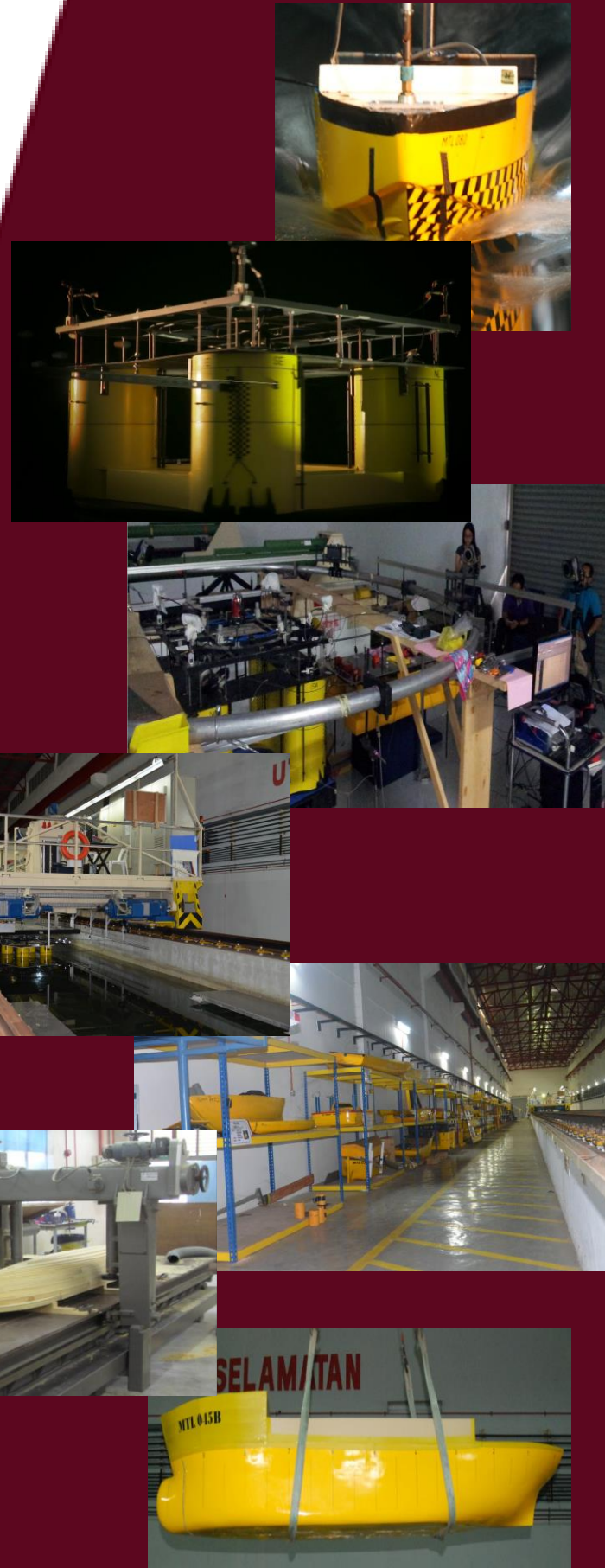




**UTM**  
UNIVERSITI TEKNOLOGI MALAYSIA

Faculty of  
Engineering

**ENGINEERING-INDUSTRY  
INNOVATION DAY  
2019**



## SHIP AND OFFSHORE TECHNOLOGY RESEARCH GROUP

UTM Faculty of Engineering research activities in naval architecture and ocean engineering is in line with the increasing demands of advanced new knowledge and well-trained professional experts in the maritime industry during the era of 4th industrial revolution. The Marine Technology Research group has its base in the Marine Technology Centre which hosts the largest towing tank for hydrodynamics testing in Malaysia, which has carried out more than 110 projects for both of the industrial needs and academic research in marine and offshore engineering. With more than 20 years' experience in the ship and offshore structure model testing and associated research and services, the team is equipped with international standard facilities and expertise in model testing, hydrodynamics, resistance and propulsion, ship design and structural analysis, wave-structure interaction, ocean renewable energy and marine transportation.

## NICHE AREA

### Fundamental Research

- ❖ Marine Hydrodynamics
- ❖ Fluid-Structure Interactions
- ❖ Dynamics of Marine Vessel
- ❖ Marine Transportation and Management
- ❖ Amphibious Technology
- ❖ Ocean Renewable Energy
- ❖ Fishery and Floating Farm
- ❖ Computational Fluid Dynamics
- ❖ Marine Structural Integrity
- ❖ Ship Resistance and Propulsion
- ❖ Vortex-Induced Vibration
- ❖ 3D Printing Model Making

### Application Areas

- ❖ Stability Integrity of Ship & Offshore Structure
- ❖ Seakeeping of Marine Structure
- ❖ Ship Hull Performance Optimization
- ❖ Disaster Relief Vehicle
- ❖ Deepwater Riser and Mooring
- ❖ Numerical Wave Tank
- ❖ Reliability & Safety Assessment
- ❖ Ocean Energy Converter
- ❖ Offshore Farming
- ❖ Structural Health Monitoring
- ❖ Hybrid Model Making and Rapid Prototyping



### Research Centers:

**Marine Technology Centre  
Universiti Teknologi Malaysia  
Johor Bahru**

## SERVICES AND FACILITIES

### Model Experiment and Consultancy Services

- ☐ Resistance/Drag Measurement
- ☐ Propulsion Tests
- ☐ Fluid Flow and Body Interaction
- ☐ Analysis Seakeeping Behavior in Waves
- ☐ Ocean and Coastal Engineering Modeling
- ☐ Maneuvering Simulation
- ☐ Lightship Survey
- ☐ Stability Assessment
- ☐ Design Service

### Facilities

#### Towing Tank

- Length 120m (useful length 90m)
- Width 4m
- Water depth 2.5m
- Towing carriage speed 0.10 to 4.5 m/s
- Consist of a hinged dry back type flap (maximum wave height 0.44m for wave period of 1.7sec)
- Wave absorber installation

#### Workshop

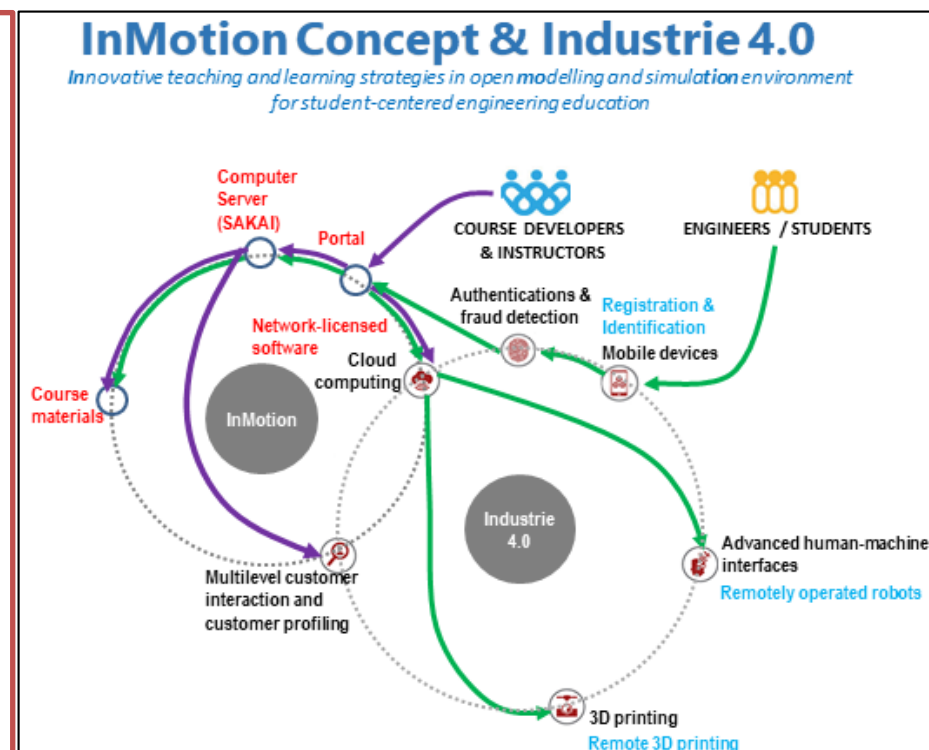
- Wood and metal workshop for model making purpose



## FLAGSHIP RESEARCH

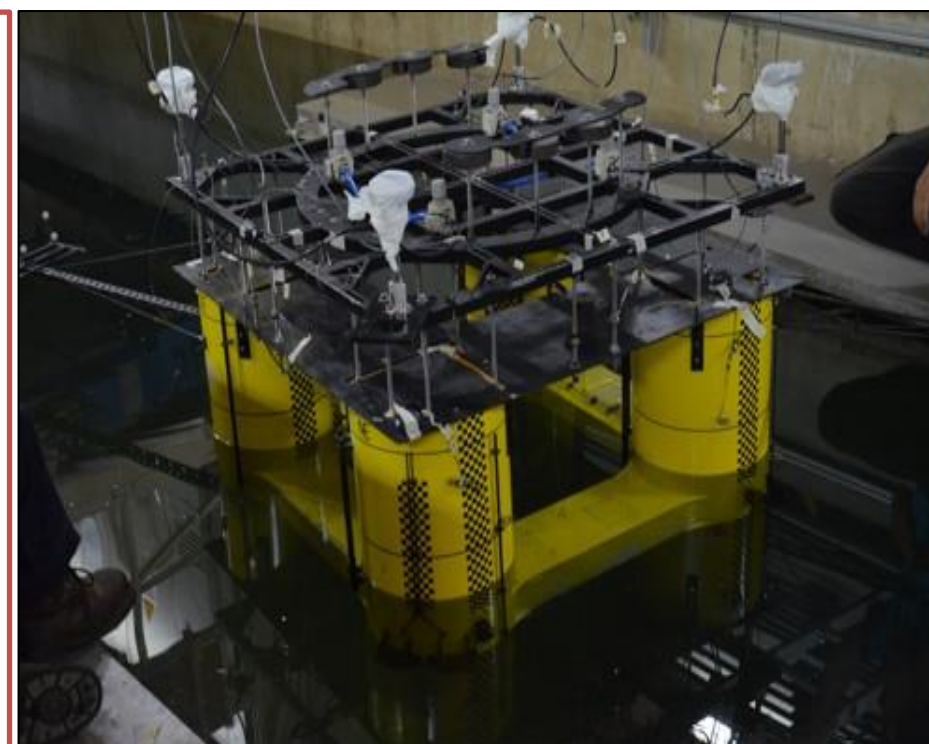
### Innovative Teaching and Learning Strategies in Open Modeling and Simulation Environment for Student-Centered Engineering Education (InMotion)

InMotion is a European Union Grant project carried out in Faculty of Engineering, which aims to create new eLearning Materials for Computer Modelling and Simulation for Engineering (CMSE) field with Open Modelling and Simulation Environment platform (OMSE) based on innovative teaching strategies and creative learning approaches, particular to Marine students. InMotion targets to train graduates, engineers, researchers from European Countries and Pacific Countries to be competent in the CMSE field and hence the realization of Industrie 4.0.



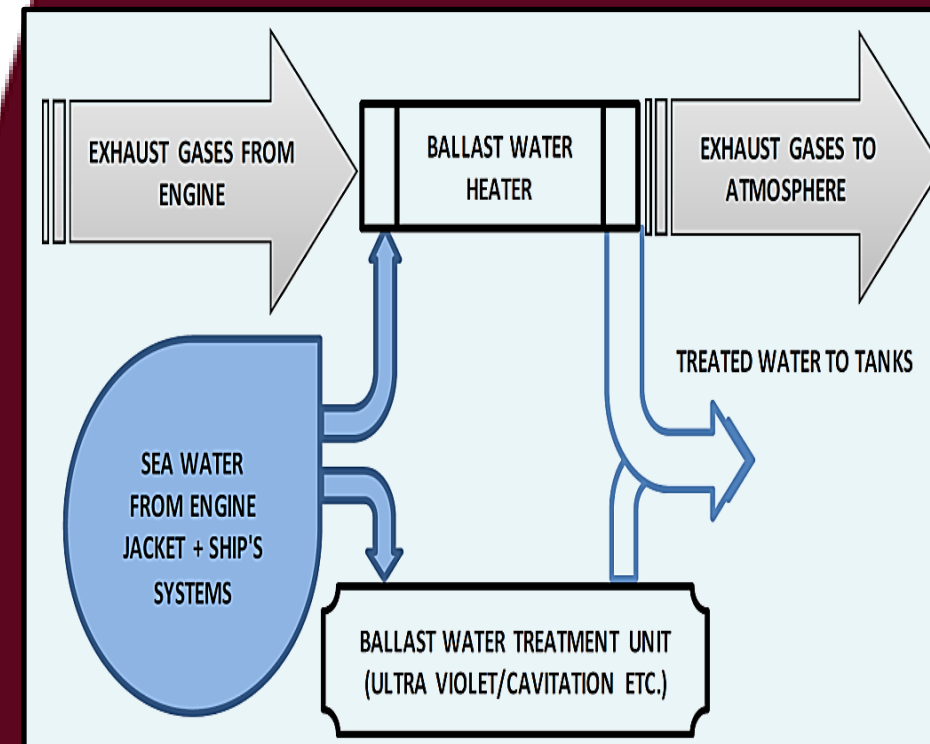
### Sustainable Deep Water Hydrocarbon Production Technology

The world's energy demand is greater than ever before, and extracting this energy from deep water is a major challenge. Vibrations caused by water currents is one of the biggest challenges for deep water platforms. Shell and Marine Technology Centre of Universiti Teknologi Malaysia has produced a safe and sustainable solution to this problem. Malikai, the first deep water tension leg platform in Malaysia, uses this ground breaking U-shape fairings technology in deep water production.



### Combined Ocean Renewable Energy System (CORES)

CORES is a development of the first combined Ocean energy harvesting system in Malaysia seas condition. The group developed, constructed, and installed a prototype demonstrator and test platform for the Malaysian sea. In order to harvest large power from the ocean, CORES combine wave and current devices on the same shared floating platform. Wave and tidal energy data from the chosen site location, Pulau Tinggi, in the state of Johor, Malaysia was assessed to estimate the output power to be produced. Meanwhile, a comprehensive study was conducted to optimize the CORES concept to verify its reliability, safety, and cost-effectiveness.



### Ballast Water Treatment (BWT) System Utilising Shipboard Waste Heat

The Ballast water convention 2004 is expected to come into force by 2017. All commercial ships are required by international law to install a ballast water treatment. There are more than 800 ships (greater than 400GT) in Malaysia alone. Development of an efficient treatment method by using shipboard waste heat in a ballast water treatment system to reduce both initial capital investment and operational costs. A System developed based on heat filtration. Heat is to be harvested from on board resources (Engine exhaust & Engine CW) employing heat exchangers and heat can be directly added by mixing the exhaust gases with ballast water.

**For further details, please contact:**

### Head of Research Group



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