

Kasetsart University
 Faculty of International Maritime Studies
 Program in Maritime Transportation

1. NAME OF CURRICULUM

Bachelor of Science Program in Maritime Transportation

2. NAME OF DEGREE

Bachelor of Science (Maritime Transportation)

B.S. (Maritime Transportation)

3. Curriculum Outline for Maritime Transportation

Total credit requirements	at least	129	credits
1) General Education Courses	at least	30	credits
1.1) Wellness	at least	6	credits
1.2) Entrepreneurship	at least	3	credits
1.3) Language and Communication	at least	13	credits
1.4) Thai Citizen and Global Citizen	at least	5	credits
1.5) Aesthetics	at least	3	credits
2) Maritime Transportation Courses	at least	93	credits
2.1) Compulsory Courses		87	credits
2.2) Elective Courses	at least	6	credits
3) Free Electives	at least	6	credits
4) Internship at least 240 hours or 30 workdays (Except for students who joining cooperative program)			
5) Detail of Curriculum			
1. General Education Courses	at least	30	credits
1.1 Wellness	at least	6	credits
01175xxx Physical Education Activity			1(0-2-1)
* Student has to obtain the other 5 credits, at least, by choosing other subjects in this category.			
1.2 Entrepreneurship	at least	3	credits
* Student has to choose subjects in this category to complete minimum credit requirement.			
1.3 Language and Communication	at least	13	credits
03754xxx English			9(- -)
Thai Language			3(- -)
Information Technology/Computer at least			1(- -)
1.4 Thai Citizen and Global Citizen		5	credits

01999111 Knowledge of the Land 2(2-0-4)

* Student has to obtain the other 3 credits, at least, by choosing other subjects in this category.

1.5 Aesthetics at least 3 credits

* Student has to choose subjects in this category to complete minimum credit requirement.

2. Maritime Transportation Courses at least 93 credits

2.1 Compulsory Courses 87 credits

01417111	Calculus I	3(3-0-6)
01420119	Abridged Physics	3(3-0-6)
03521231	Information Technology for Navigation and Maritime Logistics	3(3-0-6)
03521261	International Maritime Terminology	2(2-0-4)
03521471	Maritime Economics	3(3-0-6)
03521472	Port Management	3(3-0-6)
03521473	Marine Insurance	3(3-0-6)
03523111	Basic Principles and Calculations in Maritime Transport	3(3-0-6)
03523212	Statistical Analysis in Maritime Business	3(3-0-6)
03523221	International Trade and Maritime Transportation	3(3-0-6)
03523223	Cargo Transportation	3(3-0-6)
03523224	Cargo Management on Board	3(3-0-6)
03523225	Maritime Transport Business	3(3-0-6)
03523241	Climate Change and Marine Environmental Sustainability	3(3-0-6)
03523321	Multimodal Transportation	3(3-0-6)
03523322	Shipping Route Strategy	3(3-0-6)
03523331	Maritime Law	3(3-0-6)
03523332	Customs Formalities	3(3-0-6)
03523341	Maritime Transport of Hazardous Materials	3(3-0-6)
03523342	Health and Environmental Risk related to Transportation	3(3-0-6)
03523351	Warehouse Design and Operations	3(3-0-6)
03523361	Quantitative Analysis for Transport Management	3(3-0-6)
03523362	Ship Chartering and Brokering Business	3(3-0-6)
03523421	Shipping and Port marketing	3(3-0-6)
03523451	Increasing Efficiency in Supply Chain and Logistics	3(3-0-6)
03523461	Maritime Business Quality Systems	3(3-0-6)
03523462	Port Operations and Cargo Handling	3(3-0-6)
03523471	Computer Application in Maritime Transport	3(2-2-5)

03523495	Maritime Transport Project Preparation	1(0-3-2)
03523497	Seminar	1
03523499	Maritime Transport Project	2(0-6-3)

2.2 Elective Courses **at least 6 credits**

from the following courses -:

03521476	Pollution Prevention from Maritime Transportation	3(3-0-6)
03523422	Port's Location and Physical Characteristics	3(3-0-6)
03523423	Maritime Business Projects Feasibility Study	3(3-0-6)
03523424	Cruise Line Operations	3(3-0-6)
03523441	Environmental Impacts in Ports	3(3-0-6)
03523452	Maritime Logistics Innovation	3(3-0-6)
03523453	Multivariate Analysis in Maritime Business	3(3-0-6)
03523463	Logistics Simulation for Decision Making	3(3-0-6)
03523464	Container Transportation	3(3-0-6)
03523490	Cooperative Education	6
03523496	Selected Topic in Maritime Transport	3(3-0-6)
03523498	Special Problems	3

3. Free Electives **at least 6 credits**

4. Internship at least 240 hours or 30 workdays
(Except for students who joining cooperative program)

Course Planning for Maritime Transportation Students

Non-Cooperative Program

First Year

Semester 1

Course Number	Title	Credits (lecture-lab-self study)
01417111	Calculus I	3(3-0-6)
01420119	Abridged Physics	3(3-0-6)
01999111	Knowledge of the Land	2(2-0-4)
	Thai Language	3(- -)
	Information Technology/Computer	1(- -)
	Thai Citizen and Global Citizen	3(- -)
	Total	<u>15(- -)</u>

Semester 2

Course Number	Title	Credits (lecture-lab-self study)
03523111	Basic Principles and Calculations in Maritime Transport	3(3-0-6)
01175xxx	Physical Education Activity	1(0-2-1)
01355xxx	English	3(- -)
	Wellness	2(- -)
	Entrepreneurship	3(- -)
	Aesthetics	<u>3(- -)</u>
	Total	<u>15(- -)</u>

Second Year

Semester 1

Course Number	Title	Credits (lecture-lab-self study)
03521231	Information Technology for Navigation and Maritime Logistics	3(3-0-6)
03523212	Statistical Analysis in Maritime Business	3(3-0-6)
03523221	International Trade and Maritime Transportation	3(3-0-6)
03523225	Maritime Transport Business	3(3-0-6)
01355xxx	English	3(- -)
	Wellness	3(- -)
	Total	<u>18(- -)</u>

Semester 2

Course Number	Title	Credits (lecture-lab-self study)
03521261	International Maritime Terminology	2(2-0-4)
03521471	Maritime Economics	3(3-0-6)
03523223	Cargo Transportation	3(3-0-6)
03523224	Cargo Management on Board	3(3-0-6)
03523241	Climate Change and Marine Environmental Sustainability	3(3-0-6)
	Free Electives	<u>3(- -)</u>
	Total	<u>17(- -)</u>

**Third Year
Semester 1**

Course Number	Title	Credits (lecture-lab-self study)
03523321	Multimodal Transportation	3(3-0-6)
03523331	Maritime Law	3(3-0-6)
03523332	Customs Formalities	3(3-0-6)
03523341	Maritime Transport of Hazardous Materials	3(3-0-6)
03523351	Warehouse Design and Operations	3(3-0-6)
01355xxx	English	<u>3(- -)</u>
	Total	<u>18(- -)</u>

Semester 2

Course Number	Title	Credits (lecture-lab-self study)
03521472	Port Management	3(3-0-6)
03523322	Shipping Route Strategy	3(3-0-6)
03523342	Health and Environmental Risk related to Transportation	3(3-0-6)
03523361	Quantitative Analysis for Transport Management	3(3-0-6)
03523362	Ship Chartering and Brokering Business	3(3-0-6)
	Free Electives	<u>3(- -)</u>
	Total	<u>18(- -)</u>

End of Semester 1 Internship at least 240 hours or 30 workdays

Fourth Year

Semester 1

Course Number	Title	Credits (lecture-lab-self study)
03521473	Marine Insurance	3(3-0-6)
03523421	Shipping and Port marketing	3(3-0-6)
03523451	Increasing Efficiency in Supply Chain and Logistics	3(3-0-6)
03523461	Maritime Business Quality Systems	3(3-0-6)
03523462	Port Operations and Cargo Handling	3(3-0-6)
03523471	Computer Application in Maritime Transport	3(2-2-5)
03523495	Maritime Transport Project Preparation	1(0-3-2)
	Total	<u>19(18-3-35)</u>

Semester 2

Course Number	Title	Credits (lecture-lab-self study)
03523497	Seminar	1
03523499	Maritime Transport Project	2(0-6-3)
	Elective Courses	6(- -)
	Total	<u>9(- -)</u>

Cooperative Education Program

First Year

Semester 1

Course Number	Title	Credits (lecture-lab-self study)
01417111	Calculus I	3(3-0-6)
01420119	Abridged Physics	3(3-0-6)
01999111	Knowledge of the Land	2(2-0-4)
	Thai Language	3(- -)
	Information Technology/Computer	1(- -)
	Thai Citizen and Global Citizen	3(- -)
	Total	<u>15(- -)</u>

Semester 2

Course Number	Title	Credits (lecture-lab-self study)
03523111	Basic Principles and Calculations in Maritime Transport	3(3-0-6)
01175xxx	Physical Education Activity	1(0-2-1)
01355xxx	English	3(- -)
	Wellness	2(- -)
	Entrepreneurship	3(- -)
	Aesthetics	<u>3(- -)</u>
	Total	<u>15(- -)</u>

Second Year

Semester 1

Course Number	Title	Credits (lecture-lab-self study)
03521231	Information Technology for Navigation and Maritime Logistics	3(3-0-6)
03523212	Statistical Analysis in Maritime Business	3(3-0-6)
03523221	International Trade and Maritime Transportation	3(3-0-6)
03523225	Maritime Transport Business	3(3-0-6)
01355xxx	English	3(- -)
	Wellness	3(- -)
	Total	<u>18(- -)</u>

Semester 2

Course Number	Title	Credits (lecture-lab-self study)
03521261	International Maritime Terminology	2(2-0-4)
03521471	Maritime Economics	3(3-0-6)
03523223	Cargo Transportation	3(3-0-6)
03523224	Cargo Management on Board	3(3-0-6)
03523241	Climate Change and Marine Environmental Sustainability	3(3-0-6)
	Free Electives	<u>3(- -)</u>
	Total	<u>17(- -)</u>

**Third Year
Semester 1**

Course Number	Title	Credits (lecture-lab-self study)
03523321	Multimodal Transportation	3(3-0-6)
03523331	Maritime Law	3(3-0-6)
03523332	Customs Formalities	3(3-0-6)
03523341	Maritime Transport of Hazardous Materials	3(3-0-6)
03523351	Warehouse Design and Operations	3(3-0-6)
01355xxx	English	<u>3(- -)</u>
	Total	<u>18(- -)</u>

Semester 2

Course Number	Title	Credits (lecture-lab-self study)
03521472	Port Management	3(3-0-6)
03523322	Shipping Route Strategy	3(3-0-6)
03523342	Health and Environmental Risk related to Transportation	3(3-0-6)
03523361	Quantitative Analysis for Transport Management	3(3-0-6)
03523362	Ship Chartering and Brokering Business	3(3-0-6)
03523495	Maritime Transport Project Preparation	1(0-3-2)
	Free Electives	<u>3(- -)</u>
	Total	<u>19(- -)</u>

Fourth Year

Semester 1

Course Number	Title	Credits (lecture-lab-self study)
03521473	Marine Insurance	3(3-0-6)
03523421	Shipping and Port marketing	3(3-0-6)
03523451	Increasing Efficiency in Supply Chain and Logistics	3(3-0-6)
03523461	Maritime Business Quality Systems	3(3-0-6)
03523462	Port Operations and Cargo Handling	3(3-0-6)
03523471	Computer Application in Maritime Transport	3(2-2-5)
03523497	Seminar	1
03523499	Maritime Transport Project	<u>2(0-6-3)</u>
	Total	<u>21(18-6-38)</u>

Semester 2

Course Number	Title	Credits (lecture-lab-self study)
	Elective Courses	<u>6(--)</u>
	Total	<u>6(--)</u>

COURSE DESCRIPTIONS

03523111	Basic Principles and Calculations in Maritime Transport Fundamental of calculation in maritime transport. Systems of equations and inequalities for maritime transport problem. Creating and evaluating models. Time series for demand estimation. Basic probability for decision-making. Applications of derivatives and integrals in maritime business.	3(3-0-6)
03523212	Statistical Analysis in Maritime Business Statistical report and presentation in maritime industry. Analysis of maritime transport statistics using probability. Random variable and probability distribution. Mathematical expectations for decision making in maritime business. Distribution of statistics used in logistics and maritime business. Inferential statistics used for hypothesis testing. Analysis of variance in maritime transport business. Simple linear regression and correlation. Application of analytical result.	3(3-0-6)
03523221	International Trade and Maritime Transportation Ship registration and world fleet. Freight and hire rates. Cargo transportation and port. Letter of credit. Uniform Customs and Practice (UCP) for Documentary Credits. International commerce terms (INCOTERMS). International sale of goods. Documents and bill of lading for maritime transportation. Marine cargo insurance. Maritime transportation and supply chain. Documents required for ship registration. Documents required for import and export customs clearance.	3(3-0-6)
03523223	Cargo Transportation Cargo transportation business. Maritime transport. Transportation system analysis, Basic traffic analysis system. Delay and queuing analysis. Transport demand and supply. Fundamental techniques of transport demand forecasting. Transportation planning. Location selection. Transportation problem.	3(3-0-6)
03523224	Cargo Management on Board Hold. Cargo loading. Cargo discharging. Cargo calculations on board. Ship stability. Cargo arrangement. Cargo keeping on board. Load line. Movement of goods on board.	3(3-0-6)
03523225	Maritime Transport Business	3(3-0-6)

Importance and components of maritime transport. Relevant business and organizations. Business analysis and planning. Financing and investment. Business organization structure. Business strategy formulation. Ship management. Port state control. Maritime transport business risks.

- 03523241* Climate Change and Marine Environmental Sustainability 3(3-0-6)
Climate change and global warming. Blue carbon ecosystems. Mangroves and climate change. Species diversity and density of plankton in mangrove forest. Environmental factors influencing their living. Sources of marine pollutants. Types of pollution and their effects on marine environments. Measurement and analysis of marine pollutants. Protection and mitigation of the impact of coastal development on ecosystem. Types, principles and strategies for sustainable utilization on marine and coastal resources. Coastal community-based management and sustainability.
- 03523321 Multimodal Transportation 3(3-0-6)
Prerequisite : 03523221
Characteristics of general intermodal transportation and Multimodal transportation. Maritime transportation. Land transportation. Rail transportation and Air transportation. Analysis of advantage and disadvantage of transportations. Transportation networks. Connectivity of transportation. Factors affecting on selection mode of the transportation. Infrastructure increasing the efficiency of multimodal transportation. Law and regulation of multimodal transportation and carriage of goods by sea. Case study.
- 03523322 Shipping Route Strategy 3(3-0-6)
Maritime routes for shipping. Planning and selecting of suitable and safe maritime routes. Calculation of route and duration for transport of goods by sea. Case study.
- 03523331 Maritime Law 3(3-0-6)
Law of the sea, International Maritime Organization (IMO), The Carriage of Goods by Sea Act. The Multimodal transport Act. Ship Mortgage and Marine Preferential Act. Arrest of sea going ships. Civil liability and damages arising from collision of vessels act. Rights and duties of the carrier and the shipper. Bill of lading. Liability and limitation of ship-owners. Maritime insurance. Related laws and acts.
- 03523332 Customs Formalities 3(3-0-6)
Regulations of customs management on vehicles and goods. Customs procedures. Customs tariff. Customs valuation systems and assessment.

Customs control and penalties. Tax incentive in customs law. Connectivity and utility of customs management to logistics.

- 03523341 Maritime Transport of Hazardous Materials 3(3-0-6)
Characterization and classification of hazardous substances. Physicochemical properties of hazardous materials. Toxic hazards. Marking, labeling, placarding and safety data sheet of hazardous substances. Transportation of hazardous materials. Storage of hazardous substances. Control and minimization of potential hazards cause by hazardous substances. Safety management and emergency response. Fate and transport of hazardous substances in environment. Pollution prevention and operation of hazardous waste facility.
- 03523342 Health and Environmental Risk related to Transportation 3(3-0-6)
Principles of health and environmental risk assessment for sustainable development. Relevant laws and regulations. Types of pollutants in workplace and transportation. Toxic effects on health and environmental quality. Dose-response relationships. Exposure and risk assessment. Risk characterization. Health and environmental risk management. Application of mathematics and modeling. Case studies.
- 03523351 Warehouse Design and Operations 3(3-0-6)
Warehouse design. Use of information technology in warehouse management. Storage and transport equipment. Space design in warehouse. Warehouse operation. Resource allocation in warehouse. Analytical techniques of cargo flow. System design and selection of cargo handling equipment.
- 03523361 Quantitative Analysis for Transport Management 3(3-0-6)
Types of quantitative analysis, linear programming, linear programming problem solving, dual problem and sensitivity analysis, assignment problems, inventory models, project planning and control with PERT and CPM techniques, decision models, simulation model
- 03523362 Ship Chartering and Brokering Business 3(3-0-6)
Ship and chartering business. Ship management. Costs in managing ship. Voyage charter. Standard form of voyage charter party. Laytime calculation. Time charter. Standard form of time charter party. Bareboat charter. Standard form of bareboat charter party. Shipbroker and vocational ethic. Ship sale and purchase.

03523421	Shipping and Port Marketing Principle in shipping and port marketing. Competition circumstances. Business's and competitors' potential analysis. Market forecast. Strategic setting of shipping and port. Case study of liner shipping business and leading port in the world.	3(3-0-6)
03523422	Port's Location and Physical Characteristics Importance of port. Engineering criteria. Infrastructure criteria. Economic criteria. Social criteria. Environmental criteria. Legal criteria. Methods of site selection. Environmental impact from ports. Environmental impact assessment for port projects. Sustainable port development. Importance of waves in the port, Wind wave theory. Nearshore wave transformation. Wave statistics. Water level. Roles of breakwater. Case studies.	3(3-0-6)
03523423	Maritime Business Projects Feasibility Study Overview and characteristics of the maritime business. Analysis of factors affecting the project investment. The feasibility analysis of the maritime project in terms of marketing, techniques, logistics, management, finance and economic. Case study.	3(3-0-6)
03523424	Cruise Line Operations Basic concept of cruise liner business, Dynamics of modern cruising. Cruise line industry terminology. Cruise line management. Cruise geography and its itinerary. Stakeholder collaboration in cruise business and cross-cultural communication related to cruising. Emerging trends concerned with the futurology of the cruise line business.	3(3-0-6)
03523441	Environmental Impacts in Ports Environmental impacts in ports. Environmental impacts in maritime transportation. Components of ports and wharf areas associated with environmental impacts. Laws related to environmental impacts and ports. Preventing and resolving environmental impacts in port. Environmental impacts monitoring in ports. Case study.	3(3-0-6)
03523451	Increasing Efficiency in Supply Chain and Logistics Supply chain and logistics management. Data collection issues related to supply chain and logistics management. Problem solving analysis. Resolution selection. Systematic data collection. Problem prevention in supply chain and logistics management.	3(3-0-6)
03523452	Maritime Logistics Innovation	3(3-0-6)

Information retrieving for maritime logistics innovation. Port's innovation. Ship innovation. A current situation study. Maritime logistics innovation trend. Maritime logistics innovation design. Case study of maritime logistics innovation development. Innovation applied. Innovation assessment.

- 03523453 Multivariate Analysis in Maritime Business 3(3-0-6)
Multiple regression for berthing demand estimation. Analysis of variance for evaluating 2-leading firms' financial performance. Multivariate analysis of variance for benchmarking logistics performance in maritime industry. Factor analysis for developing measurement of port performance. Logistics regression for measuring shipping collaborative relationship. Ordinal logistics regression for shipping credit financing. Time series analysis for marine negative externality management.
- 03523461 Maritime Business Quality Systems 3(3-0-6)
Importance of quality system for maritime business. Quality management system. Establishment of quality systems. Documentation of quality management system. International standards. Application of quality systems to organization. Auditing and certification of quality management system in maritime business.
- 03523462 Port Operations and Cargo Handling 3(3-0-6)
Characterization of port system. Port operations. Operation planning in port. Berths and terminals. Port's resource allocation. Cargo and cargo handling in port. Port labor and human resource management. Port performance and benchmarking. Port logistics.
- 03523463 Logistics Simulation for Decision Making 3(3-0-6)
Basic statistics for simulation. Conceptual of simulation development for logistics problem. Specific data collection and analysis. Analysis of Simulation results. Simulation development of in decision making involving logistics management.
- 03523464 Container Transportation 3(3-0-6)
Principle of container transport. Container transportation by ship road and rail. Container networks. Decision analysis of container stuffing process. Calculation on container freight. Container terminal operation. Container handling system. Container yard management. Empty container reposition.
- 03523471 Computer Application in Maritime Transport 3(2-2-5)

Application of office software. Deployment of basic spreadsheet software. Use of functions library and formulas. Use of macro and VBA. Application of spreadsheet software for information displaying and monitoring. Basic programming using a high-level programming language. Development of simple models to support problem solving in maritime transportation works.

03523490	Co-operative Education On the job training as a temporary employee according to the assigned project including report and presentation.	6
03523495	Maritime Transport Project Preparation Preparation of project proposal. Literature review and progress report.	1(0-3-2)
03523496	Selected Topic in Maritime Transport Selected topics in maritime transport at the bachelor's degree level. Topics are subject to change each semester.	3(3-0-6)
03523497	Seminar Presentation and discussion on interesting topics in maritime transportation at the bachelor's degree level.	1
03523498	Special Problems Study and research in maritime transportation at the bachelor's degree level and compile into a written report.	3
03523499	Maritime Transport Project Prerequisite : 03523495 Project of practical interest in various fields of maritime transport project.	2(0-6-3)

Required fundamental course descriptions

01417111	Calculus I Limits and continuity, derivatives and applications, differentials and applications, integration and applications.	3(3-0-6)
01420119	Abridged Physics Mechanics, thermodynamics, wave, sound, static electricity, current, magnetic, electromagnetic wave, light, introduction to modern physics.	3(3-0-6)
03521231	Information Technology for Navigation and Maritime Logistics	3(3-0-6)

Information Technology. Vessel traffic management system. Electronic data interchange for Maritime transportation. Cargo tracking and monitoring system. Maritime logistic management system.

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|----------|---|----------|
| 03521261 | International Maritime Terminology | 2(2-0-4) |
| | Vocabulary and standard marine communication as required by International Marine Organization. Marine vocabulary. Onboard, ship-to-ship and ship-to-shore communication. Standard message for helping and finding people in emergency case. Search and Rescue communication. | |
| 03521471 | Maritime Economics | 3(3-0-6) |
| | Fundamental of economic. Relationship between maritime industry and economic. Demand and supply forecasting. Shipping fee, cost and tax. | |
| 03521472 | Port Management | 3(3-0-6) |
| | Business management and marketing in port industry. Maritime operation in port with environment, health and safety consideration. Port security and emergency management. | |
| 03521473 | Marine Insurance | 3(3-0-6) |
| | History and development of marine insurance. General average. Terms and conditions. | |
| 03521476 | Pollution Prevention from Maritime Transportation | 3(3-0-6) |
| | Marine ecosystem. Marine water quality. Marine pollution. Effect of bilge water and ballast water on marine ecosystem and marine water quality. Marine pollution from ship-generated waste according to MARPOL 73/78 ; Pollution Prevention from Maritime Transportation and technologies from maritime transport. Case study of pollution prevention from maritime transportation. | |