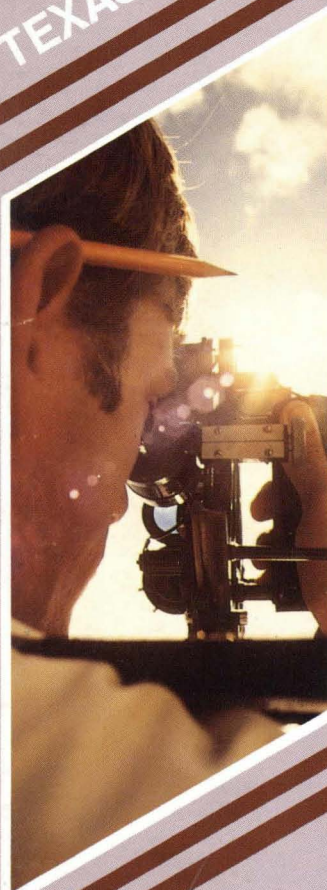


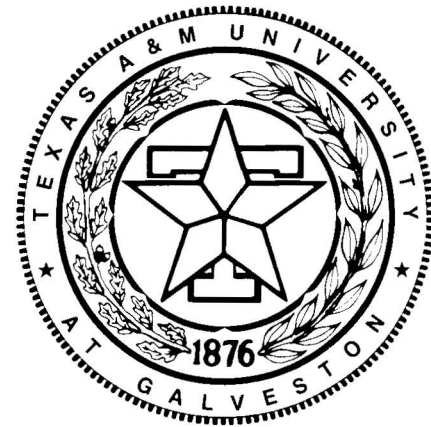
B'S Book
TEXAS A&M UNIVERSITY AT GALVESTON



85-86
Catalog

TEXAS A&M UNIVERSITY AT GALVESTON

**1985-1986
CATALOG**



A Part of The Texas A&M University System



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TEXAS A&M UNIVERSITY AT GALVESTON

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Texas A&M University at Galveston is served by a Board of Visitors appointed by the Board of Regents of The Texas A&M University System. The Board functions in an advisory capacity to the President.

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THE ACADEMIC CALENDAR FOR 1985-86

SUMMER SESSION 1985

May 25	Saturday. T/S TEXAS CLIPPER departs on summer cruise.
June 1	Summer School at Sea students depart on summer cruise.
June 3	Monday. Registration for the first term and the 11-week semester.
June 4	Tuesday. First day of first term and 11-week semester classes.
June 6	Thursday. Last day for enrolling in the University for the first term and 11-week semester and for adding new courses.
June 7	Friday. Last day for dropping courses with no record for the first term and the 11-week semester.
June 14	Friday. Last day for dropping courses with no penalty for the first term (Q-drop). Last day to apply for all degrees to be awarded in August.
June 27	Thursday. Last day for dropping courses with no penalty for the 11-week semester (Q-drop).
July 4	Thursday. Independence Day Holiday.
July 9	Tuesday. Last day of first term classes. Last day to withdraw from the University for the first term.
July 10	Wednesday. First term final examinations.
July 11	Thursday. Registration for the second term. First term final grades due in Student Records Office, 10 a.m.
July 12	Friday. First day of second term classes.
July 16	Tuesday. Last day for enrolling in the University for the second term and for adding new courses.
July 17	Wednesday. Last day for dropping courses with no record for the second term.
July 24	Wednesday. Last day for dropping courses with no penalty for the second term (Q-drop).
August 4	Sunday. T/S TEXAS CLIPPER returns from summer cruise.
August 12	Monday. Grades for graduating students due in Student Records Office, 10 a.m.
August 14	Wednesday. Last day for 11-week semester classes.
August 15	Thursday. Last day of second term classes.
August 16	Friday. Second term and 11-week semester final examinations.
August 17	Saturday. Second term and 11-week semester final grades due in Student Records Office, 10 a.m. Commencement for first and second term and 11-week semester graduating students.

FALL SEMESTER 1985

August 28-30	Wednesday-Friday. Orientation, delayed registration, adds and drops. Entering First Year License Option Cadets receive midshipman packets during Naval Science Orientation.
September 2	Monday. First day of fall semester classes.
September 6	Friday. Last day for enrolling in the University for the fall semester and for adding new courses.
September 13	Friday. Last day to apply for all degrees to be awarded in December.
September 17	Tuesday. Last day for dropping courses with no record. Midshipman Application Packets from all First Year License Option students due to Department of Naval Science.
October 4	Friday. Last day for dropping courses with no penalty (Q-drop).
October 18	Friday. Midsemester grades due in Student Records Office, 10 a.m.
November 13	Wednesday. Preregistration for the 1986 spring semester.
November 28-29	Thursday-Friday. Thanksgiving holiday.
December 5	Thursday. Grades for graduating students due in Student Records Office, 10 a.m.
December 13	Friday. Last day for fall semester classes. Last day to withdraw from the University. Commencement.
December 16-19	Monday-Thursday. Fall semester final examinations.
December 20	Friday. Final grades due in Student Records Office, 10 a.m.

SPRING SEMESTER 1986

January 8-10	Wednesday-Friday. Orientation, delayed registration, adds and drops.
January 20	Monday. First day of spring semester classes.
January 24	Friday. Last day for enrolling in the University for the spring semester and for adding new courses.
February 4	Tuesday. Last day for dropping courses with no record.
February 7	Friday. Last day to apply for all degrees to be awarded in May.
February 21	Friday. Last day for dropping courses with no penalty (Q-drop).
March 7	Friday. Midsemester grades due in Student Records Office, 10 a.m.
March 17-21	Monday-Friday. Spring break.
April 16	Wednesday. Preregistration for the 1986 fall semester.
May 1	Thursday. Grades for graduating students due in Student Records Office, 10 a.m.

May 2	Friday. Last day of spring semester classes. Last day to withdraw from the University. Convocation and Commencement.
May 3	Saturday. Final Review.
May 5-8	Monday-Thursday. Spring semester final examinations.
May 9	Friday. Final grades due in Student Records Office, 10 a.m.

SUMMER SESSION 1986

June 2	Monday. Registration for first term and the 11-week semester.
June 3	Tuesday. First day of first term and 11-week semester classes.
June 5	Thursday. Last day for enrolling in the University for the first term and 11-week semester and for adding new courses.
June 6	Friday. Last day for dropping courses with no record for the first term and the 11-week semester.
June 13	Friday. Last day for dropping courses with no penalty for the first term (Q-drop). Last day to apply for degrees to be awarded in August.
June 26	Thursday. Last day for dropping courses with no penalty for the 11-week semester (Q-drop).
July 4	Thursday. Independence Day holiday.
July 8	Tuesday. Last day of first term classes. Last day to withdraw from the University for the first term.
July 9	Wednesday. First term final examinations.
July 10	Thursday. Registration for the second term. First term final grades due in Student Records Office, 10 a.m.
July 11	Friday. First day of second term classes.
July 15	Tuesday. Last day for enrolling in the University for the second term and for adding new courses.
July 16	Wednesday. Last day for dropping courses with no record for the second term.
July 23	Friday. Last day for dropping courses with no penalty for the second term (Q-drop).
August 13	Wednesday. Last day of 11-week semester classes.
August 14	Thursday. Last day of second term classes. Last day to withdraw from the University for the second term or 11-week semester.
August 15	Friday. Second term and 11-week semester final examinations.
August 16	Saturday. Second term and final grades due in Student Records, 10 a.m. Commencement for first and second term and 11-week semester graduating students.

**TEXAS A&M UNIVERSITY
AT GALVESTON**



PURPOSE

Texas A&M University at Galveston is the marine and maritime component of The Texas A&M University System. The University provides academic instruction in seven marine and maritime-related degree programs leading to Bachelor of Science degrees from Texas A&M University.

The University consists of the Moody College of Marine Technology, the Texas Maritime College, and the Coastal Zone Laboratory. The degree programs offered are four-year courses of study with majors in Marine Biology, Marine Engineering, Marine Fisheries, Marine Sciences, Marine Transportation, Maritime Administration and Maritime Systems Engineering. All programs, except Marine Fisheries, Maritime Administration, and Maritime Systems Engineering, offer, as an option, training leading to qualification for a U.S. Coast Guard license as a Third Mate or Third Assistant Engineer.

Texas A&M University at Galveston includes one of five state operated maritime educational institutions in the nation. Federal support for the University's U.S. Maritime Service Cadet Training Program is provided in the form of a Training Ship, annual appropriations for ship maintenance, \$100,000 per year in operating funds, and student incentive payments to offset the cost of textbooks, uniforms and subsistence to approximately 130 eligible U.S.M.S. cadets. In conjunction with the formal academic instruction, an active program of research and extension service is conducted throughout the University. Texas A&M University at Galveston also coordinates all of The Texas A&M University System programs in the Galveston area.

Classes are held at the Mitchell Campus on Pelican Island, as well as at the Fort Crockett Campus on Galveston Island. The training ship, **T/S TEXAS CLIPPER**, serves as a floating classroom, laboratory, and dormitory for the annual summer training cruise of the U.S. Maritime Service cadets and Summer School at Sea students. During the regular school year, the ship is berthed at Pelican Island and provides valuable dockside laboratory facilities for instruction in the practical aspects of the maritime curricula.

The location of the University in Galveston affords students the opportunity to utilize facilities of the local maritime and marine industries both ashore and afloat as well as to benefit from the active programs of field research and instruction in the nearby bay, estuarine and nearshore waters.

Accreditation

Texas A&M University at Galveston is fully accredited by the Southern Association of Colleges and Schools. The Marine Engineering curriculum is accredited by the Accreditation Board for Engineering and Technology.

Library Facilities

The University Library is housed on the Mitchell Campus and is being continually developed in support of the degree programs offered by the University. In addition to supporting the academic curricula, it serves the professional, recreational and general reading needs of the students and staff of the University along with many people in the marine and maritime-related fields of the Galveston area.

The University Library holds 42,000 volumes and receives 725 periodical subscriptions. Its particular strengths are in the marine sciences, and in maritime technology. A new library is scheduled for completion during the summer of 1986. The new library will be capable of housing up to 100,000 books and will seat 200 readers.



TEXAS MARITIME COLLEGE

The Texas Maritime College offers degree programs in Marine Engineering, Marine Transportation, Maritime Administration, and Maritime Systems Engineering, and also administers the Department of Naval Science which offers courses in support of the license option program. Degree programs in Marine Engineering and Marine Transportation offer training toward qualification for professional licenses as engineering or deck officers in the Merchant Marine of the United States.

The engineering programs range from the theory, design, operation and maintenance of maritime power plants to fundamental engineering design, preparing the student for work or further study in any marine-oriented engineering field. Engineering majors require above average ability in mathematics and the sciences and serious intention by the student to invest extra time and effort.

Transportation of foreign and domestic commerce by sea and the management of the maritime industry require the development of modern management techniques, both afloat and ashore. The need to move foreign and domestic commerce as quickly and as efficiently as possible demands capable leadership at every level of management. Students should have a strong interest in the maritime industry and, if choosing a career path leading to sea, an understanding of the particular demands required of the professional maritime service officer.

MOODY COLLEGE OF MARINE TECHNOLOGY

In order to ensure his survival and prosperity, man must gain a better understanding of the sea, its opportunities and dangers, its interaction with the land, the air and with all living things.

In order to prepare future scientists to meet this challenge, the Moody College of Marine Technology offers programs in Marine Biology, Marine Fisheries, and Marine Sciences leading to the B.S. degree, and also administers the Department of General Academics which offers courses in the liberal arts and mathematics in support of all the University's degree programs. The various curricula offer students the combined benefits of rigorous classroom instruction and extensive laboratory and field experience. Graduates are qualified to enter directly into careers in marine biology, chemistry, geology, oceanography, fisheries management and assessment, and aquaculture, depending on their chosen area of specialization. Graduates are also well prepared to enter Master of Science and Doctor of Philosophy programs in fields pertaining to their undergraduate training.

The Marine Biology and Marine Sciences programs offer, as an additional option, professional training leading toward qualification for U.S. Coast Guard licensing as a deck officer in the U.S. Merchant Marine (See section on Corps of Cadets for discussion of eligibility and additional training requirements).

GRADUATE PROGRAMS

Graduate programs of Texas A&M University in Biology and in Wildlife and Fisheries Sciences are also conducted at Texas A&M University at Galveston. Students already possessing the appropriate B.S. degree are eligible to apply for admission and may arrange to do so by contacting either the Coordinator, Graduate Programs, Texas A&M University at Galveston; the Head, Department of Biology, Texas A&M University, College Station; or the Head, Department of Wildlife and Fisheries Sciences, Texas A&M University, College Station.

COASTAL ZONE LABORATORY

The Coastal Zone Laboratory coordinates the research, advisory and extension activities of the University. Research activities have included oyster mariculture, use of offshore oil rigs for oceanographic engineering, distribution of blue crabs in experimental temperature gradients, development of a pilot oyster hatchery, and various shrimp studies. Currently, research being conducted includes nearshore water and sediment process dynamics, analysis of water-related fatalities in the coastal zone, oyster mortality, geochemical analysis of sedimentation in Galveston Bay, microbiological and zoological studies of continental shelf waters and seabed, marine education, environmental impacts associated with construction of a liquified natural gas port facility, and theoretical research in chemistry and physics.

Extension activities are currently carried out through the SCUBA training program and the Marine Radar Simulator Training Facility, operated by the Center for Marine Training and Safety, and the Oil Spill and Hazardous Material School operated by the Texas Engineering Extension Service. The Radar Simulator Training Facility offers courses leading to both original certification and recertification for shipboard radar observers.

SUMMER SCHOOL AT SEA

Recent high school graduates may participate in the Summer School at Sea program conducted on board the T/S TEXAS CLIPPER during the annual summer training cruise. In this program the new students are allowed to choose two three-semester hour courses from offerings in English, history and mathematics. In addition to daily classes, they are also responsible for assisting the ship's crew in maintaining and operating the **TEXAS CLIPPER**, assisting with food services, and maintaining their quarters during the training cruise.

For students interested in Marine Engineering, first-hand experience with operation of the ship's power plants is available. For those interested in Marine Transportation, there is an opportunity to work on the bridge or on deck under the supervision of a licensed merchant marine officer. The program also allows the potential merchant marine officer to determine if his or her initial attraction to the sea is one that can be directed through the University curricula toward a career in the maritime service.

While it is hoped the Summer School at Sea participants will continue their collegiate careers at Texas A&M University at Galveston or elsewhere in The Texas A&M University System, the academic credits earned during the summer cruise should be transferable to other colleges and universities which they may attend.



GENERAL INFORMATION

The purpose of this catalog is to provide information about the academic programs of Texas A&M University at Galveston to students and prospective students as well as the faculty and staff of the University. Included is information concerning admissions, academic regulations and requirements, services available to students, academic offerings and a list of the administrative officers and faculty of the University.

Students enrolled in Texas A&M University at Galveston adhere to the same academic requirements as students enrolled at Texas A&M University. These requirements are also detailed in the Texas A&M University Catalog. Students are advised to study these requirements as well as the Texas A&M University at Galveston Rules and Regulations which concern other aspects of student life.

Students are required to complete the courses listed in a curriculum; however, the display of a curriculum does not in any way indicate the length of time required to finish degree requirements. Rather, this display is intended as a guide to indicate the preferred order for completion of degree requirements. Exceptions to certain requirements may be petitioned through the department head to the dean of the academic college.

This catalog was prepared in advance of its effective date; therefore, the course descriptions may vary from actual course content due to advancements in the discipline, interests of individual professors or decisions to change the scope of a course. Thus, the catalog is not a contract, but simply an information bulletin and the University reserves the right to change any of the provisions. Some of the newer courses and changes in the courses are included in this catalog pending their approval by the Coordinating Board, Texas College and University System. A separate class schedule giving course offerings and other pertinent information is published for each semester and session and is available on request from the Student Records Office. Students should refer to the class schedule for the offerings in any given semester. For administrative reasons, because of insufficient enrollment or because of limited resources, any given course might not be offered in the announced semester.

Academic Year

The academic year of Texas A&M University at Galveston is divided into the fall and spring semesters and the summer session which consists of either two terms of 5½ weeks each or one 11-week summer semester.

During the summer session most of the departments offer courses which are selected to meet the needs of the regular university students.

ADMISSION

Admission to Texas A&M University at Galveston and any of its sponsored programs is open to qualified individuals regardless of race, color, religion, sex, age, national origin or educationally unrelated handicaps.

Applications for admission to Texas A&M University at Galveston should be completed according to the printed directions and addressed to the Office of Admissions and Records, Texas A&M University at Galveston, P. O. Box 1675, Galveston, TX 77553. Acceptance by the Office of Admissions does not constitute admission to the U.S. Maritime Service License Option Program. (See the section on Admission to the U.S. Maritime Service License Option Cadet Program for information).

When admission requirements have been satisfied, the Office of Admissions and Records will send the applicant a letter of acceptance. The Office of Student Affairs will send a medical history and immunization form to the student. State law requires that all students enrolled in an institution of higher education present evidence of immunization against diphtheria, tetanus, and, if under 19 years of age, poliomyelitis. Students entering or re-entering Texas A&M University at Galveston must furnish proof of the required immunization by completing and returning the medical history and immunization form prior to the first day of classes.

Deadlines for Application

Those who meet the standards will be admitted until the last day for enrollment during the semester requested. International students must meet the deadlines specified in the International Admission section.

Freshman Admission

To be admitted to Texas A&M University at Galveston an applicant must be graduated from a properly accredited secondary school. In addition, the applicant must have satisfactorily completed certain high school subjects and must have made an acceptable score on the Scholastic Aptitude Test.

Steps in Applying for Admission to Texas A&M University at Galveston:

1. Application for Admission: Write to the Office of Admissions and Records, Texas A&M University at Galveston, P. O. Box 1675, Galveston, Texas, 77553, to obtain an application. Applications are also available at high school/college nights or from high school counselors.
2. Transcripts: Ask the high school counselor or registrar to forward an official transcript to the Office of Admissions and Records. This transcript must reflect grades complete through six semesters of high school work. The transcript should also reflect the rank in class and the list of courses which will be completed during the senior year. To be considered official, a transcript must bear an original signature of a school official and/or the school seal.
3. Testing: Arrange through high school counselor to take the Scholastic Aptitude Test (SAT), English Composition Achievement Test and Mathematics Achievement Test of the College Board (CB). Designate that the scores be sent to Texas A&M University at Galveston (Code 6835) by the CB. It is recommended that the SAT be scheduled in the latter part of the junior year or early part of the senior year. The achievement tests are used for counseling and placement purposes and should be taken by January of the senior year. Students are admitted on the basis of specified courses taken in high school, class rank, and SAT score, but the results of the achievement tests must be received before they can register.

When to Apply

There are two major periods when high school students may apply for admission to Texas A&M University at Galveston. One is for students who are eligible for the early decision program and the other for students who do not meet those requirements.

In order to recognize and reward superior academic performance, the University has an early decision program that allows students to apply for admission at the end of their junior year in high school. To be eligible for this program, students must rank in the highest quarter of their class and score at least 1000 on the SAT. Students who wish to apply under this program may submit their applications for admission after their junior year. A list of courses to be taken in the senior year must be included with the transcript. As soon as the applications are processed, letters of acceptance are mailed to those who meet the admission requirements. Acceptance is conditional until students have satisfactorily completed the courses they are scheduled to take their senior year and graduated from high school.

Students who do not meet the requirements for early decision should submit their applications for admission and credentials after October 1 of the senior year. Notifications of acceptance are sent on a continuing basis. Acceptance to the University is conditional until students have satisfactorily completed courses in progress for the senior year and graduated from high school.

Required High School Credits

The unit requirements for admission to the University are designed to insure adequate preparation for the various curricula offered by the University. To give deserved recognition to proven ability as reflected by high academic achievement, applicants who rank in the highest quarter of their class and score a minimum total score of 1000 on the College Board's Scholastic Aptitude Test may be granted admission with credit deficiencies. The sixteen acceptable entrance credits which a student should have for admission (with exceptions indicated where applicable) are as follows:

Credit Required		Remarks
Subject	Units	
English	4	Two units in a single foreign language may be substituted for one unit or 3 quarter units in English.
Social Science	2½	
Mathematics:	3	These 3 units must include Algebra I, Algebra II and Geometry.
Science	2	It is preferred that these two units include biology, chemistry, or physics.
Electives	4½	Recommended from the following subject areas: foreign languages, mathematics, science, social science, speech. Not more than three units in vocational subjects may be submitted as electives. Applicants for admission to engineering, mathematics, and science are strongly advised to include at least ½ unit electives in advanced mathematics.
TOTAL	16	

Tests Required of New Students

Texas A&M University at Galveston requires certain College Board tests as a part of its admission procedures for those applicants seeking admission to their first semester of college or university work. Results of these tests are to be used for admission, counseling, and placement purposes. The following tests are required: Scholastic Aptitude Test (SAT), English Composition Achievement Test and Mathematics Achievement Test (Level I or II). The College Board offers these examinations at conveniently located testing centers throughout the United States and in major cities of many foreign countries. Testing dates, locations, and fees required are described in an information bulletin which may be obtained by writing to the College Board, Box 592, Princeton, N.J. 08540. When registering for these tests, students should designate that the results be sent to Texas A&M University at Galveston (CB Code 6835). Test scores will not be accepted unless furnished directly to Texas A&M University at Galveston or Texas A&M University in College Station by the College Board.

The University will accept scores on either Mathematics Test: Level I or Level II. However, most students are expected to take the mathematics test, Level I. Students interested in taking the Mathematics Test, Level II, should do so only after careful study of the College Board Publication, *Achievement Tests*, and a conference with a high school counselor or mathematics teacher.

The test scores listed below are the minimum requirements for admission for applicants who have never attended another college or university are stated in terms of a total score on the College Board's Scholastic Aptitude Test. This total score is the sum of the verbal and mathematical scores reported by the College Board.

Standing in High School Graduating Class	Minimum Total Score Acceptable for Admission
Top 10%	No minimum
Highest Quarter	800
Second Quarter	800
Third Quarter	900
Fourth Quarter	1000

Early Admission

Students who have a superior high school record who wish to enter the University before graduating from high school may apply for early admission.

Students who wish to enroll in Texas A&M University at Galveston as full time students at the end of their junior year must have a superior academic record, complete the prescribed 16 credits required of entering freshmen, rank in the top quarter of their class and score at least 1200 on the SAT, with at least 600 on the verbal section of the SAT. In addition, they must be recommended by their high school principal and counselor and have their parent's approval if under 18 years of age. Students must submit the results of the English composition and mathematics achievement tests. A personal interview is also required. Further information may be obtained from the Office of Admissions and Records.

Provisional Admissions Program

High school graduates who have never attended college and who meet all the admissions criteria with the exception of having achieved the minimum required score on the Scholastic Aptitude Test may be considered for admission under this program on a space-available basis.

Participation in this program is available only during the summer immediately following a student's graduation from high school. Such students are permitted to enroll in the University for both summer sessions and are required to complete three courses, achieving an overall C average (2.0 grade point ratio) or higher in order to continue the succeeding fall semester.

Further information concerning this program is available upon request to the Office of Admissions and Records, Texas A&M University at Galveston, P. O. Box 1675, Galveston, Texas 77553.

TRANSFER ADMISSION

Admission may be granted to undergraduate students who have begun their work at other colleges or universities and who have satisfied the requirements as set forth below. A transfer student is defined as one who has registered at another college or university. An applicant may not disregard the academic record of any previous education received at another institution.

An applicant must be eligible to return to the institution from which the transfer is sought. Applicants seeking admission to the license option curricula who have attended another maritime academy or college must provide a letter to the Office of Student Affairs from the superintendent of the other academy or college verifying that the student is eligible to return to that institution. Applicants must also submit a formal application for admission as well as two official transcripts of their record at each college or university previously attended as early as possible. This material should be sent to Office of Admissions and Records, Texas A&M University at Galveston, P. O. Box 1675, Galveston, Texas 77553. The applicant must have achieved an overall grade point ratio of 2.00 (C average) or better on the work attempted and must meet or surpass this same standard for each of the last two semesters of attendance, if in attendance two or more semesters. A twelve-week summer session with a normal load of course work will be considered a full semester.

A student who has fewer than 18 semester hours of transferable credit must meet the admission requirements for entering freshmen as well as the 2.00 standard indicated above. The high school record, college record, and the test results will be used to determine admission status. The results of either the Scholastic Aptitude Test or the American College Testing Program (ACT) will be accepted in determining eligibility for admission as a transfer student.

On the basis of the credentials submitted, credit will be given for work completed satisfactorily at another properly accredited college or university as long as the work is equivalent in character and extent to similar work at Texas A&M University at Galveston or Texas A&M University. Credits given by transfer are provisional and may be cancelled at any time if the student's work at the University is unsatisfactory. See the section entitled "Transfer of Credits" for additional information.

Transfer students should read carefully the section of this catalogue entitled "Requirements for a Baccalaureate Degree," particularly the portion which explains residency requirements.

Courses in a subject area which are more elementary than the beginning required courses in that same subject area of a student's chosen curriculum at this University will not apply toward satisfying the degree requirements of that curriculum.

INTERNATIONAL ADMISSION

If space is available, international students (non-U.S. citizens) with outstanding academic records may be considered for admission to Texas A&M University at Galveston through the Admissions Office of Texas A&M University, College Station, Texas. For information about application deadlines, admissions criteria, English language proficiency, and expenses, international students should request a copy of the brochure, "Information for Prospective International Students," from the Office of Admissions, Texas A&M University, College Station, Texas 77843-0100, U.S.A.

The deadlines for admission are February 1 for the fall semester and the summer session, September 1 for the spring semester.

Steps in Applying for Admission to Texas A&M University at Galveston

1. Application for Admission: Write to the Office of Admissions, Texas A&M University, College Station, Texas 77843-0100, USA, to obtain an international student application and information brochure.
2. Testing: All international students must take the Test of English as a Foreign Language (TOEFL). Information about the test may be obtained by writing to TOEFL, Box 899, Princeton, New Jersey 08540, USA. International applicants are encouraged to take the Scholastic Aptitude Test (required for graduates of U.S. high schools). Information may be obtained from the address above or a high school counselor.

All students whose native language is not English are also required to take a rigorous oral and written examination when they arrive at the University. On the basis of this examination and other English proficiency information, students will be assigned:

- a. to a full-time University program, OR
- b. to a part-time University program AND a part-time English program in the English Language Institute (ELI), OR
- c. to a full-time English program in the English Language Institute.

Students who are required to attend courses in the English Language Institute will take additional time to complete a degree.

3. Transcripts: Submit official academic records along with the certified English translations if the original documents are not in English. Secondary school records must show completion of a college preparatory curriculum. Applicants who have attended another college or university must submit these records in addition to secondary school records. All applicants must have a B average or better to be considered for admission.

4. Finances: Texas A&M University at Galveston does not have scholarship funds available for international students. Each international student must furnish proof of sufficient financial resources in U.S. dollars. If accepted for admission, international students are required to make an advance deposit toward their first semester expenses.

READMISSION OF STUDENTS

Any former student who has resigned, been dropped from the rolls, or has not attended Texas A&M University at Galveston or Texas A&M University for at least one full semester must complete an Application for Readmission and submit it to the Office of Admissions as early as possible. If the student has attended any other institutions since last enrolled at Texas A&M University at Galveston or Texas A&M University, then two official transcripts from EACH of these schools should be submitted at the time of reapplication.

Applicants must have achieved an overall GPA of 2.0 (C Average) or better on the work attempted and must have at least a 2.0 GPA for each of the two most recent semesters in attendance, if in attendance 2 or more semesters.

Readmission to the University does not constitute readmission to the U.S. Maritime Service License Option Program. Students returning to the University who wish to enter or reenter the Corps of Cadets as a license option student must apply for admission to the Corps of Cadets through the University's Department of Student Affairs.

ADMISSION BY INDIVIDUAL APPROVAL

The Office of Admissions and Records can, under extreme mitigating circumstances, waive the admissions requirements of a student who presents strong evidence of ability to succeed in the University.

Undergraduates who have not recently attended school and who cannot satisfy the entrance requirements in full may be admitted, subject to the following requirements:

1. They must submit a completed application for admission.
2. They must furnish evidence that their preparation is substantially equivalent to that required of other applicants and that they possess the ability and seriousness of purpose necessary to pursue their studies with profit to themselves and to the satisfaction of the University.

ADMISSION OF STUDENTS NOT SEEKING A DEGREE

A limited number of applicants who are not currently seeking a degree from Texas A&M may be admitted subject to the following requirements:

1. They must submit two complete, official transcripts from each college or university attended.
2. They must submit an application which includes statements on work experience, why a full-time course of study is not being pursued, plan of study listing needed courses and the purpose for taking these courses.

International applicants are not admitted as non-degree seeking students.

UNDECLARED MAJORS

Freshmen and new transfer students who are not yet ready to declare a major field of study, or students who have decided to discontinue pursuit of a previously declared curriculum, are temporarily assigned to the department of General Academics for purposes of advisement and administration. Advisors in the department of General Academics will help such students devise course schedules that permit sampling of courses in several subjects in order to provide a basis for choosing the most appropriate major field of study. At the same time, students will be enrolling in some courses that will satisfy common basic requirements in as many curricula as possible within the scope of their general interest.

It is expected that most students will declare a major within one academic year after assignment to the department of General Academics.

Students in General Academics will be advised to carefully consider the number and variety of academic curricula available to them at TAMUG (or at TAMU-College Station, if appropriate). A sample general semester course schedule for a freshman student who is not yet ready to declare a major curriculum might be as follows:

Engl. 103 Composition and Rhetoric (3-0)	3
Hist. 105 History of the U.S. (3-0)	
and/or	
Pol. S. 206 (American National Government) (3-0)	3-6
Mathematics*	3-4
Physical or Biological Science*	3-4
Elective*	3-4
MARS 101* Intro. to Marine Science	1
	<hr/> 15-19 hours†

*To be selected in consultation with faculty advisor on the basis of the student's background, interests, and goals.

†The total number of credit hours may vary from 15 to 19 depending on the student's choice of courses after consulting with an advisor.

REGISTRATION

Registration for the fall and spring semesters is accomplished at two times. In the preceding fall and spring semester, a preregistration period is held for currently enrolled students to register for the next semester. During the week before classes begin for a particular semester, there is a delayed registration period for all those students who have not already registered. Summer school registration is the day before classes begin each summer term and the 11-week semester. Further information concerning registration may be obtained from the academic calendar published in this catalog or from the Office of Admissions and Records. Schedules of classes are available at the Office of Admissions and Records shortly before registration periods.

ORIENTATION CONFERENCES

Prior to the Fall and Spring Semesters, orientation conferences are conducted for all new students including transfer students. During these conferences students meet with individual advisors, register for classes, receive academic and student life briefings, and may, if qualified, take placement examinations.

ACADEMIC ADVISING

Within each college of the University, academic advising is coordinated and supervised by the department heads. Students majoring in curricula offered by the department can ordinarily obtain counseling concerning academic program planning and curriculum-related matters from departmental faculty members who serve as academic advisors. If there are special problems, the department head, the dean or the Vice President for Academic Affairs may be consulted.

Within the degree programs of the two colleges, students may pursue individual career interest through selection of courses with the assistance of departmental advisors.

Students who need counseling help of a more specialized nature concerning vocational or non-academic problems should seek help from the Office of Student Affairs.

COURSE CREDIT

CREDIT BY EXAMINATION

For Entering Freshmen—Texas A&M University at Galveston and Texas A&M University participate in the credit by examination services of the College Board (CB). In addition, the University offers its own credit by examination using certain departmental examinations. Credit hours are awarded in appropriate courses without a letter grade.

The College-Level Examination Program (CLEP) is designed for the purpose of evaluating non-traditional college-level education such as independent study, correspondence work, etc. No credit is offered at Texas A&M University at Galveston for General Examinations, but certain Subject Examinations are acceptable in basic courses in biology, chemistry, economics, English, history, management, mathematics and sociology. Students who are interested in these exams may secure registration forms from a nearby community college or university or by writing Southwestern Regional Office, College Board, Suite 922, Southwest Tower Building, 211 East 7th St., Austin, Texas, 78701. The completed registration form and fees should be sent to the CLEP Test Center at which the test is to be taken. Specific information about applicable tests and scores may be obtained from the Academic Counseling Center, Texas A&M University at College Station. There is a \$25 fee for Subject Examinations.

Texas A&M University at Galveston also offers its own credit by examination program utilizing certain departmental and national tests. Students who have made superior scores on their entrance examinations may schedule credit by examination test during a summer conference preceding their entrance in the fall. No charge is made for these examinations. They are available in biology, chemistry, English, mathematics and physics. Specific information about qualifying to take these examinations may be secured from the Office of Student Affairs.

For Enrolled Students—Undergraduate students enrolled at Texas A&M University at Galveston may participate in the university's credit by examination program. Credit will be awarded for satisfactory performance either on the appropriate Subject Examination of the College Level Examination Program or on a departmental examination. The fee for a CLEP Subject Examination is \$25; for a departmental examination, \$15. Information concerning these tests can be secured from the Office of Student Affairs.

Transfer of Credits

As a general policy, credit will be given in transfer work completed satisfactorily with a passing grade at another properly accredited institution. Credits given by transfer are provisional and may be cancelled at any time if the student's work in the University is unsatisfactory.

Students should read carefully the section entitled **Requirements for a Baccalaureate Degree**, particularly the portion on residency requirements.

CONCURRENT ENROLLMENT AT TAMUG AND OTHER COLLEGES & UNIVERSITIES

A student enrolled at Texas A&M University at Galveston who wishes to take a course or courses concurrently at another institution for degree credit at Texas A&M University at Galveston must receive the prior approval of the appropriate academic dean.

CORRESPONDENCE COURSES

Students may apply up to 12 hours of correspondence credit earned through an accredited institution toward the requirements for an undergraduate degree, even though Texas A&M University at Galveston does not offer courses by correspondence.

Correspondence courses taken through the Defense Activity for Non-Traditional Education Support (DANTES) may be accepted and included in the 12 hours allowed. Students may apply a maximum total of 30 semester hours of approved extension class work and correspondence study toward a degree.

In order for a student in residence at Texas A&M University at Galveston to receive credit for correspondence work toward a bachelor's degree, he/she should:

1. Obtain advance written permission from the dean of his or her college.
2. Present appropriate evidence of having completed the course.

ACADEMIC CREDIT FOR MILITARY SERVICE

Students who have completed one year of active duty in the armed forces of the United States may be given academic credit of four semester hours for basic ROTC.

Students who have served for at least one year in the armed forces of the United States on active duty as commissioned officers may be given academic credit of 16 semester hours for basic and advanced ROTC.

A student wishing to receive such credit should file a certified copy of his or her DD214 with the Office of Admissions, Texas A&M University (College Station) so that credit may be allowed.

ACADEMIC RULES AND REGULATIONS

Two handbooks entitled **University Academic Regulations** and **University Student Life Regulations** are prepared for the benefit of the student body. This book is the official statement of the rules and regulations which govern student conduct and student activities at Texas A&M University at Galveston and contains regulations in addition to those listed here. It is the responsibility of each individual student to read these handbooks carefully and to use them as a ready reference. Copies are available through most departments and the Office of Student Affairs.

GRADING SYSTEM

Since students attend a college or university to extend their education, grades are usually taken as an indication of the proficiency of their endeavors. The student's semester grade in a course is based upon performance in class, written exercises and tests, laboratory work and the final examination. The proportionate weight assigned to each of the factors shall be determined by the department administering the course.

The basis upon which the final grade will be determined shall be announced to the class during the first week of the semester or term.

There are four passing grades signifying various degrees of achievement, and grade points are awarded on the basis of these grades.

The lowest passing grade is 60. There is one failing grade, F, below 60, indicating work of unsatisfactory quality. Credit for a course failed may be obtained only by satisfactorily repeating the course in class. In a course including both theory and practice, the head of the department may excuse a student from repeating the practice if the grade in the practice is B or better, and if in the judgment of the head of the department, the repetition is not necessary. The student must register for both theory and practice, however.

Grade	Description	Range (Inclusive)	Grade Points per Semester Hour
A	Excellent	90-100	4
B	Good	80-89	3
C	Satisfactory	70-79	2
D	Passing	60-69	1
F	Failing	Below 60	0
I	Incomplete	---	---
Q	Dropped course with no penalty	---	---
S	Satisfactory	70-100	---
U	Unsatisfactory	Below 70	0
X	Grade not reported	---	---
WP	Withdrew passing	60-100	---
WF	Withdrew failing	Below 60	0
NG	No grade	---	---

Incomplete

The temporary grade I (Incomplete) at the end of a semester or summer term indicates that the student has satisfactorily completed the course with the exception of a major quiz, final examination or other work. This grade is given only when the deficiency is due to authorized absence or other cause beyond the control of the student and when the work already done has been of quality acceptable for the satisfactory completion of the course. Incomplete work must be completed before the end of the next fall or spring semester in the University unless the student's dean grants an extension of time for good reason. If the incomplete work is not completed within this time or if the student registers for the same course again, the I will be changed to an F by the registrar, and the student must repeat the course to receive credit for it.

Drop/Add

A student may drop courses during the first 12 class days of a fall or spring semester and during the first four class days of a summer term or an 11-week summer semester. A student may add courses during the first five class days of a fall or spring semester and during the first three class days of a summer term or an 11-week summer semester.

Full refunds or supplemental billings will be made for courses dropped or added during these times. Notices of refunds due or amounts owed will be mailed to the student's local address.

Q-Drop

After the 12th class day of a fall or spring semester or the 5th class day of a summer term or 11-week summer semester, with the approval of the dean of the student's college, a student may drop a course through the 25th class day of a fall or spring semester, the 9th class day of a summer term, or the 18th day of an 11-week summer semester. The symbol Q shall be given to indicate a drop without penalty. A student who drops a course after the Q-drop deadline will receive a grade of F unless unusual circumstances exist as determined by his or her dean. Students who withdraw from the University after the 12th class day through the 25th class day receive grades of Q in all courses.

Satisfactory/Unsatisfactory

Undergraduate students classified as juniors or seniors with a minimum overall grade point ratio of 2.5, based on at least 30 hours of credit at Texas A&M University at Galveston, may be permitted to take a total of 12 credit hours of electives during their academic careers at Texas A&M University at Galveston on a satisfactory/unsatisfactory basis as a part of the hours required for their degrees. Only undirected electives may be taken on an S/U basis. Students wanting to take a course on a satisfactory/unsatisfactory basis must register on this basis during the official registration period. Students shall not be permitted to change the basis on which their grades will be recorded on their official records.

The hours for which a student receives a grade of **Satisfactory** (C or above) shall not be included in the computation of the student's semester or cumulative grade point ratio; a grade of **Unsatisfactory** (D or F) shall be included in the computation of the student's grade point ratio at 0.0 grade points per credit hours. The hours taken on a satisfactory/unsatisfactory basis will not be included in the 15 hours required for the designation of **Distinguished Student**.

Students who transfer to Texas A&M University at Galveston must have earned at least 12 hours of credit at Texas A&M University at Galveston before taking a course on a satisfactory/unsatisfactory basis.

A student must have the written approval of his or her academic advisor or department head in order to take a course on a satisfactory/unsatisfactory basis.

Colleges may refuse to accept students on a satisfactory/unsatisfactory basis for courses requiring a prior in-depth knowledge of the subject matter.

Withdrawal From The University

Students desiring to withdraw from the University before the end of a semester or summer term are required to complete the official withdrawal form. Assistance in obtaining such clearance is provided by the Student Records Office. Students who withdraw during the first twelve class days receive no record on their permanent record. Students who withdraw from the University after the 12th class day through the 25th class day receive grades of Q in all courses. After the 25th class day, students who withdraw from the University receive grades of WP in courses they are passing and WF in courses they are failing. Students may not withdraw during final exam periods.

Repetition of a Course to Improve Grade

Any student who wishes to repeat a course to improve the grade in that course must do so before completion of a more advanced course in the same subject-matter field. The original grade will remain on the student's record, and both grades will be used in computing the GPR. An F previously made is not removed once the course is passed. Credit for a repeated course may only be used once toward degree requirements.

Semester Credit Hour

A lecture course which meets one hour per week or 16 hours per semester or summer term is assigned a value of one semester credit hour. Thus, a course worth three semester credit hours, meets for three hours per week or 48 hours per semester or summer term. Credit hours for laboratory courses are determined to be some fraction of the number of hours spent in class, usually one third.

Grade Point Ratio

Only the record made in course work for which the student was registered in this institution shall be used in determining grade point ratio. Students anticipating graduating with honors should refer to that section of this catalog for information concerning the computation of grade point ratios for that purpose. A student's grade point ratio for any given period is computed by dividing the total number of semester hours for which grades were received into the total number of grade points earned in that period. Grades of WF, U and F are included, but grades of WP, S and Q,X,I are excluded.

Grade Reports

Preliminary Report: Preliminary reports of the student's current progress are available to students in the Student Records Office near the middle of each semester. The preliminary report does not become a part of the student's permanent record.

Semester Report: At the close of each semester, an official report of the student's semester grades is mailed directly to the student at their home mailing address. Students may request, through the Student Records Office, that copies of their grades be sent to their parents or guardians. Parents or guardians may also receive grade reports if they certify that the student is carried as a dependent on their current federal income tax return.

Scholastic Probation

Whenever a student's cumulative record indicates that he or she is failing to make satisfactory progress, the student is considered scholastically deficient. The cause of the deficiency will be investigated by the dean of the college, and the student may be placed on scholastic probation for such terms as the dean shall designate, or the student may be required to withdraw from the University if the deficiency so warrants.

Scholastic probation is a conditional permission for a student to continue in the University after he or she has become scholastically deficient. This permission is granted by the dean of the student's college when an analysis of the deficiency indicates that a continuation is in the best interests of the student and the University.

Distinguished Student and Dean's Honor Roll

A student who completes a semester schedule of at least 15 hours or a summer session schedule of at least 12 hours with no grade lower than C and with a grade point ratio of at least 3.25 for the semester or a summer session shall be designated as a **Distinguished Student**. A student who, under the same circumstances, achieves a grade point ratio of 3.75 or higher will, in addition, be designated as a member of the **Dean's Honor Roll**. Official notifications of these designations are issued to the student by the dean of the student's college.

Classification

Sophomore, junior, and senior classification will be granted upon completion of 30, 60 and 95 semester hours, respectively.

Full-Time Student

A full-time undergraduate student is defined as one who is registered for 12 or more semester hours during a fall or spring semester, 6 hours or more in a summer term, and 12 hours in an 11-week summer semester.

Maximum Schedule

A student with an overall grade point ratio of 3.0 or better may register for a course load in excess of 19 hours in a fall or spring semester or six hours (seven if part is laboratory) in a summer term with the approval of his or her advisor. A student with an overall grade point ratio of less than 3.0 must obtain approval of his or her dean before registering for a course load in excess of 19 hours in a fall or spring semester or six hours (seven if part is laboratory) in a summer term.

Transcripts

Individuals who have attended the University may obtain an official transcript of their completed work, provided they have no financial obligations to the University. A fee, which according to state law must be paid in advance, will be charged for each copy. Transcripts will not be prepared during the final examination period for students currently enrolled. Students and former students who order transcripts must do so in writing, and each request must be accompanied by the individual's signature.

DEGREE INFORMATION

Texas A&M University at Galveston reserves the right to modify the curricula or withdraw any courses therefrom when it appears appropriate to do so. The policies and procedures in this catalog are currently in effect; however, the University reserves the right to make changes or modifications for good cause.

DEGREES OFFERED

The following degrees are offered by Texas A&M University for the satisfactory completion of resident study in the appropriate curriculum at Texas A&M University at Galveston:

MOODY COLLEGE OF MARINE TECHNOLOGY

Bachelor of Science with a major in Marine Biology
Bachelor of Science with a major in Marine Fisheries
Bachelor of Science with a major in Marine Sciences

TEXAS MARITIME COLLEGE

Bachelor of Science with a major in Marine Engineering
Bachelor of Science with a major in Marine Transportation
Bachelor of Science with a major in Maritime Administration
Bachelor of Science with a major in Maritime Systems Engineering

REQUIREMENTS FOR A BACCALAUREATE DEGREE

The diploma of Texas A&M University, with the appropriate degree, will be granted to the student who has made formal application for the undergraduate degree and has satisfied the following requirements:

1. The student must complete, with at least a C average, one of the regular curricula of study leading to a degree.
2. A curriculum leading to a baccalaureate degree shall contain a minimum of 128 credit hours.

3. The total number of grade points earned at this institution in courses must be at least twice the number of hours which the student carried in courses at this institution. Grades of F or WF shall be included, except those grades and grades of D made in the freshman year or summer session preceding that year which are subsequently repeated at this University with a grade of C or better during the student's first four semesters. Such grades made in repeated courses do not replace the F, WF or D but the original F, WF or D may be waived for the purpose of graduation only. Grades of WP and Q shall be excluded.

Grades in courses not applying to the degree may be waived by petition if approved by the student's dean and submitted to the registrar. The waiver of grades in courses as indicated above will not affect a student's grade point ratio or entitlement to graduation with honors.

4. The total number of grade points earned at Texas A&M University at Galveston in courses in the major department must be at least twice the number of hours which were carried at this institution in the major department. Grades of F or WF shall be included but grades of WP or Q shall be excluded. Grades in courses not applying to the degree may be waived by petition if approved by the academic dean and submitted to the Registrar.
5. Grades made in courses elected in excess of a student's degree requirements shall be counted, but if failing, such courses need not be repeated.
6. The student must be formally recommended for graduation by the Academic Council after consideration of his or her complete record.
7. The student must have settled all financial obligations to the University.
8. Transfer courses taken during a student's final semester must be completed with an official transcript in the Office of the Registrar by the stated deadline or the student will not graduate that semester.
9. The student must have all grades on record in the Student Records Office not later than 12:00 p.m. on the Thursday preceding commencement for the fall and spring semesters and 5 p.m. on the Thursday preceding commencement during the summer.

These requirements must be completed and all grades must be recorded in the Registrar's Office of Texas A&M University not later than 5 p.m. on Thursday preceding Commencement Day. This includes all grades pertaining to graduation with honors.

RESIDENCE REQUIREMENT:

Candidates for degrees in Texas A&M University at Galveston curricula will observe these guidelines: For non-license option curricula, 30 of the last 36 hours must be completed in Galveston; and for license option curricula, the last two years of the minimum three-year paramilitary training requirement must be spent in Galveston in the Corps of Cadets.

The candidate for graduation must have completed a minimum of twelve semester hours in his major subject-matter field at this institution.

A student pursuing a baccalaureate degree at Texas A&M University at Galveston may transfer from a two-year college a maximum number of hours not to exceed six (6) more than the number required through the freshman and sophomore years of the chosen curriculum at Texas A&M University at Galveston. Such courses will normally be restricted to those of the freshman and sophomore years.

Requirement in Political Science (Government) and History:

In order to meet the legal requirement for a baccalaureate degree, all students must have at least six credit hours in Political Science (Government) and at least six credit hours in American History as described in detail in the following paragraphs. Students whose curricula require only three credit hours of Political Science are required to successfully complete three additional credit hours of Political Science plus one credit hour of elective if they do not elect at least three credit hours in Military, Air or Naval Science plus one elective hour.

Political Science (Government): One must have credit for six semester hours or its equivalent. Three of the six semester hours are to be in Political Science 206 (American National Government) and three semester hours in Political Science 207 (State and Local Government with emphasis on that of Texas). This requirement may also be met, in whole or in part, by equivalent course work satisfactorily completed at another accredited college or university.

Three hours of the Political Science requirement may be satisfied on the basis of equivalent work completed by a student in the program of an approved ROTC unit and/or U.S. military service. Three of the six-semester-hour requirement may be satisfied if the student meets the requirements to receive credit by examination on the basis of acceptable performance on an advanced placement examination or a comprehensive examination.

American History: One must have credit for six semester hours or its equivalent. Three of the six semester hours may be in Texas History and three semester hours in American History, or the entire six hours may be in American History. This requirement may also be met, in whole or in part, by equivalent course work satisfactorily completed at another accredited college or university.

Three hours of the requirement may be satisfied on the basis of equivalent work completed by a student in the program of an approved ROTC unit and/or U.S military service. Three hours of the six-semester-hour requirement may be satisfied on the basis of acceptable performance on an advanced placement examination or a comprehensive examination.

APPLICATION FOR A DEGREE:

Formal application for degrees must be submitted to the Student Records Office, on forms provided for that purpose, not later than 90 days prior to the end of the semester, or 30 days prior to the end of the summer term in which the student expects to complete requirements for graduation. To obtain the necessary forms, the student must pay a diploma fee in the Fiscal Office and present the fee receipt to the Student Records Officer.

In order to be a candidate for a degree at the end of a semester or summer term, a student at the beginning of that semester or term must be registered for the courses necessary to complete the requirements of the curriculum.

TWO DEGREES

A candidate for a second baccalaureate degree must have completed all the essential work of the second curriculum not covered in the first. In all such cases the total semester hours required must be at least 30 semester hours additional to the greater number required for either degree. A student is required to obtain a letter from his or her dean stating the courses required for the second degree.

GRADUATION WITH HONORS

Categories for honors shall be designated as follows:

1. Summa Cum Laude: A student may be graduated "Summa Cum Laude" with a grade point ratio of 3.900 or above.
2. Magna Cum Laude: A student may be graduated "Magna Cum Laude" with a grade point ratio range of 3.700 through 3.899.
3. Cum Laude: A student may be graduated "Cum Laude" with a grade point ratio range of 3.500 through 3.699.

To be eligible for graduation with honors, a student seeking a baccalaureate degree must enroll in and complete a minimum of 75 semester hours preceding graduation at this institution. Course credit received by examination is not included in this total. The grade point ratio of all college hours attempted, excluding transfer hours, must equal that required at Texas A&M for the appropriate category of honors.

FINANCIAL INFORMATION

EXPENSES

The expenses for a regular session of nine months will vary with the individual concerned and with the course of study pursued. In the case of new students, the total cost should range between \$3,800 and \$4,800. In general these amounts include three types of expenditures: fees payable to the University Fiscal Department, textbooks and supplies, and incidental expenses which are estimated in the range of \$600.00 to \$1500.00, depending on the individual concerned. Non-resident students, other than those pursuing a license-option curriculum, should increase these estimated expenses by \$1,100.00 to cover non-resident tuition fees.

PAYMENTS

Payments to the Fiscal Department may be in the form of cash, cashier's check, personal check, or money order payable to Texas A&M University at Galveston. All checks and money orders are accepted subject to final payment.

FEES

The fees set out herein for 1985-86 are strictly approximations and are subject to change because of economic conditions and/or legislative requirements. The fees listed below are for all students except those in license-option curricula. The fees are based on a resident student registered for fifteen semester credit hours during the fall and spring semesters and six credit hours during a term of the summer session.

	Fall Semester	Spring Semester	Summer Term (6 Weeks)
Tuition (see explanation of fees).....	60.00	60.00	25.00
Student Services	45.00	45.00	22.50
Room	749.00	749.00	284.00
Board	726.60	726.60	
Room Deposit.....	100.00		
Identification Card	3.00		1.00+
Building Use Fees	45.00	45.00	18.00
Student Center Complex Fees	10.00	10.00	5.00
	\$1,738.60	\$1,635.60	\$355.50

The estimated fees based on eighteen hours for students in a license-option curriculum are shown below:

	Fall Semester	Spring Semester	Summer Cruise
Tuition (see explanation of fees).....	90.00	90.00	60.00
Student Services	45.00	45.00	17.60*
Room	749.00	749.00	350.00
Board	726.60	726.60	692.00
Room Deposit.....	100.00		
Identification Card	3.00		1.00+
Cruise Fee.....			490.00
Building Use Fee	54.00	54.00	12.00
Student Center Complex Fee	10.00	10.00	5.00
	\$1,777.60	\$1,674.60	\$1,627.60

*Student Services Fee \$4.40/hour for summer cruise.

+Applies only to summer students not enrolled during the Fall and Spring Semesters.

DROP/ADD REFUNDS

A student may drop courses during the first 12 class days of a fall or spring semester and during the first 4 class days of a summer term or an 11-week summer semester. A student may add courses during the first 5 class days of a fall or spring semester and during the first 3 days of a summer term or an 11-week summer semester. Full refunds or supplemental billings will be made for courses dropped or added during these times. Notices of refunds due or amounts owed will be mailed to the student's local address. Refunds will be processed after the 12th class day.

WITHDRAWAL FROM THE UNIVERSITY

Once a fee payment has been accepted by the University, a student is considered officially enrolled. Stopping payment on a check for fees or allowing the check to be returned unpaid by the bank for any reason does not constitute official withdrawal. Failure to follow procedures for withdrawing from the University may result in financial penalties and difficulty with future enrollment at the University.

EXPLANATION OF FEES

Tuition

Resident students pay four dollars (\$4.00) per semester credit hour, but the total of such charges shall be not less than fifty dollars (\$50.00) per semester or twenty-five dollars (\$25.00) per summer term.

Non-resident students pay forty-six dollars (\$46.00) per semester credit hour and alien students pay sixty-nine (\$69.00) per semester credit hours.

Students who are U.S. citizens enrolled in license option curricula, whether Texas resident or non-Texas-resident, pay five dollars (\$5.00) per semester credit hour, but the total of such charge shall be no less than sixty dollars (\$60.00) per semester and sixty dollars (\$60.00) for the summer cruise.

Students who are dismissed or withdraw from a license option curriculum after the semester begins will have fees adjusted to the appropriate resident or non-resident rate retroactive to the beginning of the semester.

License option students who are granted a leave of absence for the fall, spring or summer or who enroll in the onshore summer program at the Mitchell Campus instead of the summer training cruise will pay resident or non-resident fees as appropriate for that period and fees will be retroactive to the beginning of the semester.

Under special circumstances, non-license option students may be granted permission to participate in the Corps of Cadets. Non-license students in the Corps of Cadets are not eligible for the special license option tuition and will pay normal resident or non-resident fees as applicable.

Students who in any semester register (including payment of fees) after the beginning of classes pay an additional ten dollar (\$10.00) fee.

Student Services

The student service fee is required of all students at the rate of \$3.75 per semester credit hour (not to exceed \$45.00) per semester (or \$22.50 per summer term). The student service fee for students on the summer cruise of the **T/S TEXAS CLIPPER** is \$4.40 per semester credit hour (not to exceed \$26.40). Student service fees finance health services, recreational activities, student government, student publications, student organizations, campus movies, intramural athletic programs, and social activities.

Student Center Complex Fee

The Student Center Complex Fee is required of all students at the rate of \$10.00 per semester (\$5.00 per summer term or cruise). This fee will be used for the operation, maintenance, improvement, and purchase of equipment for the Northern Student Center and for the acquisition or construction of additions to the complex.

Room Rent, Board

All undergraduate students enrolled in more than six credit hours are required to reside in campus housing if available and purchase the board plan. The limited exceptions to this requirement are detailed in the Housing section of this catalog. Any student living off campus at the beginning of the semester who adds enough hours to require living on campus must pay for room and board for the entire semester.

A deposit of \$100.00 is required to apply for a room in a residence hall. This fee will be retained as a deposit against damage or late cancellation, or to keep the application on active file. A reservation may be cancelled and deposit refunded upon written request prior to July 1 for the fall semester, December 1 for the spring semester, May 10 for the first summer session, and June 20 for the second summer session. Any cancellation after the above dates will result in forfeiture of the deposit. A refund may be made in accordance with the University policy for a student graduating or withdrawing from school, upon request, after clearance by the Student Affairs Office. Seniority in campus housing and on residence hall waiting list will be based upon the date of receipt of the room deposit; however the deposit does not guarantee assignment to on-campus housing.

Building Use Fee

This fee of \$3.00 per semester credit hour is assessed to compensate for occupancy, services, use and/or availability of all or any of the property, buildings, structures, activities, operations and other facilities of the University.

Departmental Examination Fee

Those students who have been approved by the University administration to take a departmental examination for course credit in lieu of registering for a formal course will be charged a fee of \$15.00.

Identification Card

All students must have an identification card. This card is used in registration procedures, collection of fees, cashing of checks, for dining hall privileges, etc. Replacement cards will be issued upon payment of \$6.00 fee.

Laboratory Fees

A laboratory fee ranging from \$2.00 to \$8.00 is charged for each laboratory course each semester.

Parking Permit

All students driving motor vehicles on the campus must pay a fee of \$7.50 per semester (\$5.00 per summer session) for registration and parking.

11-Week Summer Semester

Students may register for 11-week summer semester courses during the first summer term registration. They will be charged the minimum tuition for a fall or spring semester, \$50. The maximum student services fee of \$45 will also be assessed. All other mandatory and/or optional fees will be based on the number of hours taken.

Textbooks and Supplies

The cost of textbooks and supplies will vary with the quality of items purchased and with the course of study to be pursued. Students can expect to pay an amount ranging between \$300.00 and \$350.00. These amounts are estimates for the combined fall and spring semesters. Expenses for the Summer Session should amount to approximately one-half of the above estimates.

Uniforms

License-option students must purchase uniforms with initial outfitting estimated at \$450.00-\$550.00.

Mail Service Fee

The university operates a mail service for students wishing to receive mail on campus. The fee is \$7.00 per semester (\$3.50 per summer session) for each student.

Late Registration Fee

Students registering after the final registration period will be assessed a \$10.00 fee.

Graduation Fee

There is a \$15.00 fee for graduation. This should be paid within the first two weeks of the student's final semester.

Other Items

The University operates a store for the purpose of supplying necessary articles to students. The store carries textbooks, stationery, drawing instruments, toilet articles, and other supplies. All merchandise is sold at the usual retail prices prevailing in the area.

EXEMPTIONS

Certain students in the following classifications are exempt from paying tuition and some of the required fees by action of the State of Texas and the Texas A&M University System Board of Regents. Specific eligibility requirements under these provisions can be obtained from the Student Records Office.

Dependent children of disabled or killed-on-duty firemen and peace officers and firemen who are enrolled in Fire Science courses are exempt from paying tuition and laboratory fees.

Blind and Deaf students who are eligible for the rehabilitation services of the State Commission for the Blind and/or Division of Vocational Rehabilitation of the Texas Education Agency are exempt from the above fees.

Certain veterans (and dependents of veterans who died in active service), who are not eligible for federal educational benefits and are Texas citizens and were honorably discharged, may be exempt from paying tuition and laboratory fees. Orphans of members of the Texas National Guard and the Texas Air National Guard killed since January 1, 1946, while on active duty either in the service of their state or the United States may also be eligible under this provision.

The State Board of Education will certify 235 students from other nations in the American Hemisphere to be exempt from paying tuition at institutions of higher learning in the State of Texas.

Full-time employees of the Texas A&M University System are exempt from paying all fees except tuition, laboratory fees and I.D. card.

Students registered only in courses which have been designated as "off campus" are exempt from paying all fees except tuition, a building use fee of \$3 per semester credit hour, laboratory fees and I.D. card.

REFUNDS

Refund of fees (Tuition, Student Services Fee, Laboratory Fee and Residence Hall Rent) shall be made to students officially withdrawing according to the following schedule:

Six-week Summer Term	
Prior to the first class day	100 percent
During the first, second, or third class day	80 percent
During the fourth, fifth, or sixth class day	50 percent
Seventh day of class and thereafter	None
Fall or Spring Semester	
Prior to the first class day	100 percent
During the first five class days	80 percent
During the second five class days	70 percent
During the third five class days	50 percent
During the fourth five class days	25 percent
After the fourth five class days	None

Refunds on residence hall rent will not be made unless the room vacated is rerented within ten days to a student residing in other than University-owned property. If the room is rerented within this 10-day period to a student not residing in University-owned property, refunds will be made in accordance with the above schedule.

Board Fee

Board fees are refundable in full prior to the first day of classes. Refunds will be made only in case of official withdrawal at which time a *pro-rata* refund will be made, computed on a daily basis, less a withdrawal fee equaling ten percent of the semester rate.

In case of a consecutive absence of 10 or more days due to illness of the student or member of his family or for some other unavoidable cause, a *pro-rata* refund will be made, computed on a daily basis.

DROP/ADD REFUNDS

Full refunds or supplemental billings will be made after the 12th class day for courses dropped or added during the first 12 class days of a fall or spring semester and during the first four class days of a summer term or an 11-week summer semester. Notice of refunds due or amounts owed will be mailed to the student's local address. Consequently, the student is obliged to ensure that his or her correct local address and telephone number are on file in the Office of Admissions and Records.

REDUCTIONS

No reduction will be made in the charge of room rent and board in case of entrance within ten days after the opening of a semester or summer term, nor will a refund be made in case of withdrawal during the last ten days of a semester, or summer term, or the last days for which payment is made.

UNPAID CHECK

If a check accepted by the Fiscal Department is returned unpaid by the bank on which it is drawn, the person presenting it will be required to pay a penalty of \$15.00 in the form of cash or money order and, if not redeemed, the student may be dropped from the rolls of the University. In addition, the check may be turned over to the District Attorney for prosecution. A student dropped from the rolls of the University for failure to redeem an unpaid check within the grace period is eligible for reinstatement after payment of penalties, a \$50.00 reinstatement fee and redemption of the check.

Duplicate Receipts

Duplicate receipts for fees paid by students will be issued on payment of 50¢.

DAY STUDENTS

Day students pay all specified fees and charges except board (optional) and room rent.



STUDENT AFFAIRS

The Office of Student Affairs coordinates the student life programs and activities of Texas A&M University at Galveston. Information is available from this office concerning new student orientation, veterans affairs, international students, counseling services, housing, financial aid, health services, student activities, student employment, graduate placement, and the Corps of Cadets.

STUDENT FINANCIAL AID

The awarding of student financial assistance from Texas A&M University at Galveston is based upon need. In addition, an aid applicant must be enrolled as at least a half-time student and be in good academic standing. Students who are on either scholastic or conduct probation are ineligible to participate in the various aid programs.

To obtain an impartial and objective analysis of need, the University utilizes the College Scholarship Service. Therefore, all applicants for student financial aid are required to file a Financial Aid Form with the College Scholarship Service. The Financial Aid Form can be obtained from high school counselors or the University Financial Aid Office. Aid applicants are also required to apply for the Pell Grant which is a federal grant program. Applicants may apply for the Pell Grant by checking the appropriate section on the Financial Aid Form.

Student Part-Time Employment

The Office of Student Affairs is the coordinator for student part-time employment, both off and on campus.

Students solicit their employment through job leads provided by the Office of Student Affairs or through their own initiative. Employment counseling is available to those students who have not had previous job seeking experience.

Student employees of the University are paid on the University wage scale every two weeks along with regular University employees but are not entitled to fringe benefits. Students on conduct or scholastic probation during any given semester are not eligible for employment with the University for that semester.

College Work-Study Program

This federally subsidized program, within fund limitations, provides **part-time** employment for U.S. citizens and permanent residents who **have an established financial need** and desire campus employment.

To qualify for the College Work-Study Program (CWS), a student must **have submitted** a Financial Aid Form to the College Scholarship Service, have financial need, be enrolled or accepted for enrollment **and be making** satisfactory academic progress if enrolled. Students **who attend** the University only during the summer sessions are not **eligible** for this program.

CWS students are paid on the University wage scale, may not work **more than twenty hours** per week, and are not entitled to fringe **benefits**.

Loan Funds

Texas A&M University at Galveston participates in the Hinson-Hazlewood College Student Loan program, Guaranteed Student Loan Program, and the National Direct Student Loan program. **Repayment** periods on these loans usually begin six months after **graduation**. Applications for these loans must be submitted sixty days **prior to** the time when the funds are needed. Inquiries should be **addressed** to the Director of Student Financial Aid.

The Director of Student Financial Aid also administers other short-term loan funds for enrolled students. These funds are reserved to **meet emergency** needs and, in most cases, must be paid back in the **semester** in which they are loaned.

Valedictory Scholarships

These scholarships consist of exemption of tuition during the student's freshman year at Texas A&M University at Galveston and are **offered** to the highest ranking graduate (valedictorian) from each **accredited high school** in Texas. To receive this award, the valedictorian must be certified to the University through the Texas Education Agency, and the recipient's initial enrollment must be in this University. **No formal application** is required. Qualified students may obtain a **certificate** authorizing exemption from paying tuition from the Student Financial Aid Officer at the beginning of the fall semester.

Opportunity and Academic Achievement Awards

These programs provide awards to high school graduates who are capable of outstanding scholastic achievement and who need financial assistance to attend the University. The scholarships are made possible through the Association of Former Students, through the Texas A&M University Development Foundation and by interested citizens and organizations. Financial benefits range from \$100 to \$1,500 each year. Most of the awards are unrestricted as to course of study or degree objective.

Graduates of accredited high schools who have not attended another college or university and who are single are eligible to apply for an Opportunity Awards Scholarship before February 1 preceding the fall semester of entrance.

To be considered for such an award, an applicant must satisfy the admission requirements of the University, plus:

1. Make formal application on forms provided by the University;
2. Have SAT-CB scores made available to this university before February 1 preceding the fall semester of entrance;
3. Submit a Financial Aid Form to the College Scholarship Service, P. O. Box 380, Berkeley, California 94701, by February 1 preceding the fall semester of entrance;
4. Submit a high school transcript showing grade records through the first semester of the senior year with the application.

Winners are selected by the Scholarship Committee on the basis of the applicant's academic record in high school; College Board test scores; and evidence of initiative, leadership and other traits of good character.

Requests for applications and additional information should be addressed to the Director of Student Financial Aid, Texas A&M University at Galveston; P. O. Box 1675; Galveston, Texas; 77553.

Veterans and War Orphans Services

The Financial Aid Office will assist eligible students in securing the benefits and services provided by the Veterans Administration.

COUNSELING

Counseling services are available through the Office of Student Affairs. Students with educational, career, and personal concerns are **invited to visit** with the counselors. Aptitude and achievement testing and interest and personality inventories are available along with professional interpretation. In addition, referral for the use of specialized community resources will be coordinated upon the student's requests.

HEALTH SERVICES

Medical Clinic

Texas A&M University at Galveston contracts with a local community clinic for health services for enrolled students. Terms of the contract may vary from year to year, but generally office visits to the doctor are free of charge. Medications, inoculations, x-rays and other services provided at the clinic are generally available at a reduced cost. Hospitalization and emergency room visits are full-charge at the student's expense.

Group Insurance

Since there are numerous health needs and costs which are not provided or paid for by the University's Health Service, students are encouraged to purchase medical insurance. A group plan is available to all students in The Texas A&M University System. Applications for this program will be distributed during new student orientation and are available from the Office of Student Affairs. Students and parents should give careful consideration prior to dropping any current health insurance.

Summer Cruises

When the T/S TEXAS CLIPPER departs each year for the annual summer training cruise, one physician and two medical assistants operate an on-board dispensary. All services provided on board are free of charge. Should a student require hospitalization ashore or evacuation, the student will be responsible for all costs incurred because of such hospitalization or evacuation.

HOUSING

Texas A&M University at Galveston has on-campus housing in modern student dormitories. Rooms are double occupancy and furnished with beds, desks, chairs, wardrobes or closets, and dressers. Students are expected to furnish pillows, blankets, and linens. All Texas A&M University at Galveston students pursuing a license-option curriculum are required to live in campus housing and participate in the board plan. The same requirement also applies to all non-license option students who are unmarried and not residing with parents in Galveston County, if campus housing is available.

Application for campus housing, which is separate from the application for admission to the University, is available from the Office of Student Affairs. This application, along with the \$100.00 required housing deposit should be returned to the Texas A&M University at Galveston Fiscal Office. Rooms are assigned in accordance with the date on which the housing application and room deposit are received in the Fiscal Office.

Housing applications may be forwarded prior to acceptance to the University but housing assignments will be contingent upon admission to the University. It is recommended that housing applications be submitted early. In the event that on-campus housing is not available, information concerning off-campus housing will be provided upon request.

Since license option students are required to live on campus, students will be able to pursue a license option only if campus housing is available for them. To be considered for a housing assignment, students who elect a license option program of study must apply for housing *and* notify the University of their intent to study a license option program prior to July 15. A failure to receive campus housing does not preclude students from enrolling in the degree program of their choice but simply restricts participation in license option programs until campus housing is available.

STUDENT ACTIVITIES

A wide variety of student activities are coordinated through the Office of Student Affairs in the Northen Student Center. The Northen Student Center contains dining facilities, a book store, conference rooms, a post office, a dark room, a game room, counselors' offices, and other facilities. Adjacent to the Northen Student Center are the swimming pool, tennis courts and other outdoor recreational facilities.

Clubs

Clubs on campus include: Aquarium Club, American Society of Mechanical Engineers, Sailing Club, Dive Association, Outdoor Sportsmen Club, Propeller Club, Emergency Care Team, Graduate Student Association and Dormitory Association.

Student Publications

Students publish a weekly newsletter, *Nautilus*; a literary publication, *Seaspray*; and a yearbook, *Voyager*.

Student Government

The evolving student government of Texas A&M University at Galveston is embodied in the Student Advisory Committee to the President. This Committee serves as a direct communications link to the administration on student affairs. Members are elected each year.

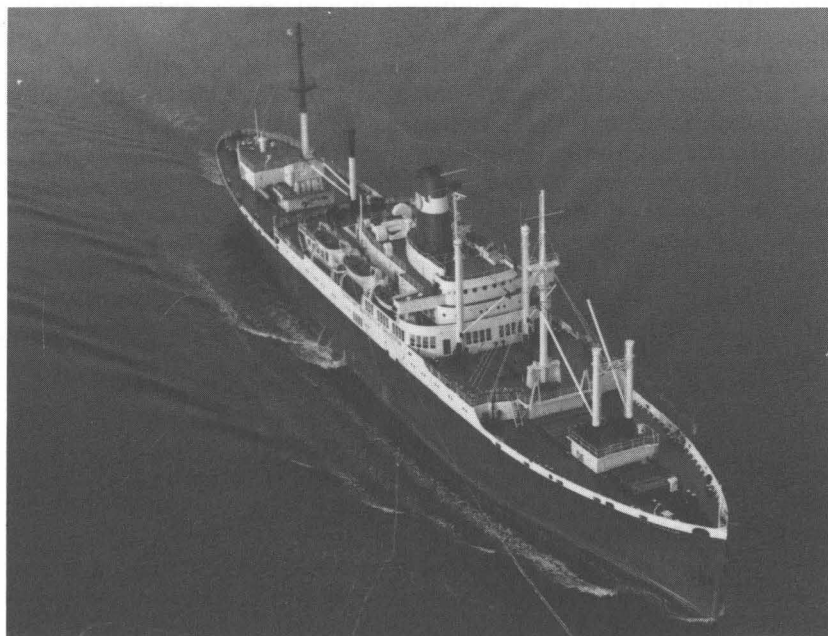
Athletics

The Intramural Program attempts to provide each student with the opportunity to participate regularly in organized activities. Teams are organized in flag football, basketball, softball, table tennis, and volleyball. Texas A&M University at Galveston also has a softball team which competes in a local city league. The University Sail Team and the Ultimate Frisbee Team compete intercollegiately.

CORPS OF CADETS

Students pursuing a University degree program leading to a United States Coast Guard License as a Merchant Marine Officer are required to join the University's Corps of Cadets. The Corps of Cadets Program provides a learning laboratory for the development of leadership and management skills and the self-discipline demanded of merchant marine officers. Cadet Corps policies provide for the organization of the cadets into a paramilitary unit, watch standing and wharfside training requirements, room and ship maintenance responsibilities, and special cadet discipline procedures. Cadets are required to apply for, and accept if tendered, midshipman status in the U.S. Naval Reserve. Cadets wear prescribed uniforms during the regular school semesters and during the required summer training cruises. Questions concerning Corps Life should be addressed to the Commandant within the Office of Student Affairs who functions as the principal administrator and advisor to the Cadet Corps.

With special permission, it is possible for students who are foreign nationals to participate in the Corps of Cadets. However, due to Federal regulations, such students will not be eligible to be examined for a license as an officer in the U.S. Merchant Marine, and they are thus not eligible for the special license option tuition fees.



ADMISSION TO A LICENSE OPTION CURRICULUM

Students who meet the admission criteria established by the United States Maritime Administration and the University may participate in the Corps of Cadets and a license option curriculum. Such participation is a privilege and not a right. Serious or excessive violation of Corps rules and regulations may be considered as evidence of inaptitude for the demanding career of a merchant marine officer and warrant dismissal from the Corps and the license option curriculum. Notification of acceptance to the University is not final approval for appointment into a license-option program or acceptance into the Corps of Cadets. The application form for acceptance into the Corps of Cadets is available from the Student Affairs Office. Final review of a student's credentials cannot be completed until after enrollment and prospective cadets will not be sworn into the program until this review is completed. Enrollment in the program includes executing an agreement that commits the cadet to accept Midshipman status if offered and to accept a commission in a reserve component in the Armed Services if offered at graduation. The initial enrollment of students in a license option curriculum must be at the beginning of a fall or spring semester. Students may not enter the program after the twelfth day of the semester.

Among the criteria evaluated are:

1. Age. The U.S. Maritime Administration restricts student incentive payments to USMS cadets who are at least seventeen but who have not passed their twenty-fifth birthday on the first day of enrollment in a license option curriculum. Texas A&M University at Galveston will consider, on a special admissions basis, students who are twenty-five or older but who have not passed their thirty-second birthday on the first day of enrollment in a license option curriculum. Cadets selected for special admissions are not eligible for any of the student incentive payments offered. These cadets, however, will participate fully in every other aspect of the license option program. They will be subject to the same requirements, privileges, considerations and obligations as cadets meeting the Federal age requirements.
2. Physical requirements. Strict physical requirements are specified for licensing as a merchant marine officer. Prior to entering a license program, prior to certification for licensing, and at any other time deemed appropriate by the University, students are required to furnish verification from a physician that they meet the specified physical requirements.

These are summarized as follows:

Deck Cadet—Minimum vision of 20/100 in both eyes correctable to 20/20 in one eye, 20/40 in the other. Pass the PIP or Williams Lantern color vision test.

Engine Cadet—Minimum vision of 20/100 in both eyes correctable to 20/30 in one and 20/50 in the other eye. Distinguish between red, blue, green, and yellow.

All cadets—Epilepsy, insanity, and badly impaired hearing are disqualifying defects.

Specific details of the required physical examinations are contained in Title 46 U.S. Code of Federal Regulations part 10. Waivers cannot be granted by the University.

3. **Background Investigation.** All applicants for admission to license option curricula and enrollment in the Corps of Cadets are subject to a Federal background investigation. Adverse information revealed by the investigation may constitute denial of a license by the Coast Guard. The University will not accept a candidate into a license option curriculum nor allow continued participation in the program when conduct infractions preclude license qualification.
4. **Citizenship.** Only United States citizens are eligible for officers' licenses in the U.S. Merchant Marine.

UNITED STATES COAST GUARD LICENSE AS A MERCHANT MARINE OFFICER

To qualify at graduation for certification by the University and for eligibility to take the Coast Guard Examinations for Third Mate or Third Assistant Engineer, students must complete all academic degree requirements, successfully complete three summer training cruises, apply for and accept if tendered a commission in the Merchant Marine Reserve/United States Naval Reserve (MMR/USNR), meet physical qualifications at the time of graduation, and participate in the Corps of Cadets every semester while enrolled in a license option which will normally require eight long semesters and three summers. Students pursuing a license option will not be granted leaves of absence from the Corps of Cadets for any fall or spring semesters in which they are enrolled in the University prior to completion of eight fall and/or spring semesters in the Corps of Cadets and three summer training cruises. Students who are dropped from the Corps of Cadets for academic or disciplinary reasons but are allowed to remain in the University will normally be disenrolled from the license option program and will not be reenrolled in a license option except under very special circumstances and after a careful review by the professional staff of the University. Under exceptional circumstances, highly qualified students may accelerate the program, but in no case will the program be completed in less than six long semesters.

THE NAVAL RESERVE COMMISSION

The Merchant Marine industry is considered a vital part of our national defense. The Navy provides active duty officers and Chief Petty Officers who are well trained in Naval procedures to provide instruction in Naval operations, seapower, and how merchant vessels are capable of operating with the Navy during peacetime, national emergency and war. This instruction is provided through two courses, Naval Science 200 and 300, which are required for all license option cadets.

In addition, the Department of Naval Science prepares eligible cadets for eventual commissioning in the Merchant Marine Reserve/United States Naval Reserve (MMR/USNR). Some cadets under this program become Merchant Marine Midshipmen. Upon completion of the Naval Science courses, graduation from TAMUG, and successful completion of the U.S. Coast Guard licensing exam, the Midshipman may be commissioned as a restricted line officer with the rank of Ensign in the MMR/USNR.

Individuals commissioned in the MMR/USNR must fulfill these obligations:

1. **Maintain the commission** for eight years.
2. **Sail on their applicable license at sea, for four months each consecutive two year period, for eight years.**
3. **Complete two weeks of active duty for training in the Navy, every year for eight years.**
4. **Submit an annual report to the administrator of the MMR/USNR Program.**

Active duty service may be requested under this program. Midshipmen also have the option of applying for active duty commissions in the Coast Guard, or commissions in the Army, Air Force, Marine Corps, U.S. Health Service or National Oceanographic and Atmospheric Administration (NOAA).

This program (1) provides Merchant Marine Officers who are familiar with Naval procedures, to the Merchant Marine industry and (2) provides the individual MMR/USNR officers, when on active duty, the benefits and pay normally provided U.S. Navy officers.

THE U.S. COAST GUARD COMMISSION

The U.S. Coast Guard MARGRAD program offers licensed graduates the opportunity to apply for direct reserve commissions involving extended active duty in the Coast Guard. Applications may be initiated during a cadet's final year prior to graduation in accordance with Coast Guard directives.

STUDENT INCENTIVE PAYMENTS

Students who enroll in a license option program for the first time during a fall semester may be eligible to compete for Student Incentive Payments. In the past, these payments have come from both the Maritime Administration and private sources and have averaged \$100.00 per month. They are awarded to students based on competitive criteria that evaluate the student's potential for completing the degree program and license requirements and for a subsequent successful maritime career.



DEGREE PROGRAMS

Curriculum in MARINE BIOLOGY (MARB)

The Marine Biology program provides an excellent education in the biological sciences through studies undertaken in a unique coastal environment. Curriculum offerings are designed to provide training in the general biology, ecology, systematics and zoogeography of estuarine and marine flora and fauna. Students receive not only a strong basis of formal academic instruction but also considerable hands-on field and collection experience.

Graduates find employment with state and federal agencies, ecological consulting firms, industry, medical laboratories and educational institutions. Marine biology degree recipients have undertaken post-graduate studies in botany, fisheries biology, systematics, mariculture, ecosystem modeling, and veterinary and human medicine.

FRESHMAN YEAR

Fall Semester	(Th-Pr)	Cr	Spring Semester	(Th-Pr)	Cr
Biol. 113 Introductory Biology.....	(3-0)	3	Biol. 114 Introductory Biology.....	(3-0)	3
Biol. 123 Introductory Biology Lab.....	(0-3)	1	Biol. 124 Introductory Biology Lab.....	(0-3)	1
Chem. 101 Fundamentals of Chemistry I.....	(3-0)	3	Chem. 102 Fundamentals of Chemistry II.....	(3-0)	3
Chem. 111 Fundamentals of Chemistry Lab I.....	(0-3)	1	Chem. 112 Fundamentals of Chemistry Lab II.....	(0-3)	1
Engl. 103 Composition and Rhetoric.....	(3-0)	3	Engl. 104 Composition and Rhetoric ... (3-0)		3
Hist. 105 History of the U.S.*.....	(3-0)	3	Hist. 106 History of the U.S.*.....	(3-0)	3
Math. 130 Mathematical Concepts — Pre-Calculus.....	(3-0)	3	Math. 230 Mathematical Concepts — Calculus.....	(3-0)	3
Naval Science or Elective†.....		1	Naval Science or Elective†.....		1
		18			18

SOPHOMORE YEAR

Chem. 227 Organic Chemistry I....	(3-0)	3	Chem. 228 Organic Chemistry II....	(3-0)	3
Chem. 237 Organic Chemistry Lab.....	(0-3)	1	Chem. 238 Organic Chemistry Lab.....	(0-3)	1
C.S. 203 Introduction to Computing.....	(3-0)	3	MARB 315 Natural History of Vertebrates.....	(2-3)	3
MARB 301 Genetics.....	(4-0)	4	Phys. 202 College Physics.....	(3-3)	4
Phys. 201 College Physics.....	(3-3)	4	Pol. S. 207 State and Local Government.....	(3-0)	3
Pol. S. 206 American National Government.....	(3-0)	3	Elective (General)†.....		2
Naval Science or Elective†.....		1	Naval Science or Elective†.....		1
		19			17

JUNIOR YEAR

Engl. 301 Technical Writing.....	(3-0)	3	Econ. 203 Principles of Economics .	(3-0)	3
Geol. 104 Physical Geology.....	(3-2)	4	MARB 425 Marine Ecology.....	(2-3)	3
MARB 311 Ichthyology.....	(2-3)	3	MARB 435 Invertebrate Zoology ...	(3-3)	4
Stat. 302 Statistical Methods.....	(2-2)	3	Elective (General)†.....		3
Elective (Biology)†.....		3	Elective (Social Science or Humanities)†.....		3
		16			16

SENIOR YEAR

Biol. 351 Fundamentals of Microbiology.....	(3-4)	4	MARB 408 Biology of Algae.....	(3-3)	4
MARB 310 Introduction to Cell Biology.....	(3-3)	4	MARB 420 Comparative Physiology.....	(3-3)	4
MARB 481 Seminar in Marine Biology.....	(1-0)	1	MARB 450 Developmental Biology of Marine Organisms.....	(3-3)	4
Elective (Botany)†.....		4	MARB 481 Seminar in Marine Biology.....	(1-0)	1
Elective (Social Science or Humanities)†.....		3	Elective (General)†.....		3
		16			16

TOTAL HOURS — 136

*The American history requirement may be fulfilled by taking other American history courses offered at Texas A&M University at Galveston, including 370, 442, or 444. Students should consult with their academic advisor.

†All elective must be chosen in consultation with, and approval by, the student's academic advisor.

Curriculum in MARINE BIOLOGY WITH A LICENSE OPTION

The Marine Biology License Option provides training in the biology of coastal and marine environments as well as a broad-based education in the maritime disciplines. Students successfully completing this program also will be qualified to sit for the U.S. Coast Guard license examination for a license as a Third Mate of Ocean, Steam or Motor Vessels.

FRESHMAN YEAR

Fall Semester	(Th-Pr)	Cr	Spring Semester	(Th-Pr)	Cr
Biol. 113 Introductory Biology.....	(3-0)	3	Biol. 114 Introductory Biology.....	(3-0)	3
Biol. 123 Introductory Biology Lab.....	(0-3)	1	Biol. 124 Introductory Biology Lab.....	(0-3)	1
Chem. 101 Fundamentals of Chemistry I.....	(3-0)	3	Chem. 102 Fundamentals of Chemistry II.....	(3-0)	3
Chem. 111 Fundamentals of Chemistry Laboratory I.....	(0-3)	1	Chem. 112 Fundamentals of Chemistry Lab II.....	(0-3)	1
Hist. 105 History of the U.S.*.....	(3-0)	3	Math. 230 Mathematical Concepts — Calculus.....	(3-0)	3
Math. 130 Mathematical Concepts — Pre-Calculus.....	(3-0)	3	NAUT 203 Seamanship I.....	(2-3)	3
NAUT 103 Marine Orientation and Lifesaving.....	(2-3)	3	NAUT 204 Terrestrial Navigation....	(2-2)	3
		<u>17</u>			<u>17</u>

SUMMER SESSION

(Ten weeks at sea on the T/S TEXAS CLIPPER)
NAUT 200 Basic Communications, Navigation and Seamanship, Credit 4

SOPHOMORE YEAR

Chem. 227 Organic Chemistry I....	(3-0)	3	Chem. 228 Organic Chemistry II....	(3-0)	3
Chem. 237 Organic Chemistry Lab I.....	(0-3)	1	Chem. 238 Organic Chemistry Lab II.....	(0-3)	1
Engl. 103 Composition and Rhetoric.....	(3-0)	3	Engl. 104 Composition and Rhetoric.....	(3-0)	3
NAUT 201 Naval Architecture I....	(3-2)	4	NAUT 202 Naval Architecture II....	(3-0)	3
N.S. 200 Merchant Marine Officer I.....	(3-0)	3	NAUT 303 Celestial Navigation....	(2-3)	3
Phys. 201 College Physics.....	(3-3)	4	Phys. 202 College Physics.....	(3-3)	4
		<u>18</u>			<u>17</u>

SUMMER SESSION

(Ten weeks at sea on the T/S TEXAS CLIPPER)
NAUT 300 Intermediate Communications, Navigation and Seamanship, Credit 4

JUNIOR YEAR

C.S. 203 Introduction to Computing.....	(3-0)	3	MARB 481 Seminar in Marine Biology.....	(1-0)	1
MARB 301 Genetics.....	(4-0)	4	MARS 310 Field Methods in Marine Science.....	(1-6)	3
MARB 311 Ichthyology.....	(2-3)	3	MART 321 Maritime Law I.....	(3-0)	3
MART 302 Marine Cargo Operations I.....	(3-3)	4	MART 406 Marine Cargo Operations II.....	(2-2)	3
N.S. 300 Merchant Marine Officer II.....	(3-0)	3	Met. 302 Weather Reports and Forecasting.....	(3-0)	3
		<u>17</u>	NAUT 301 Seamanship II.....	(2-3)	3
			NAUT 304 Electronic Navigation....	(2-2)	3
					<u>1</u>
					<u>19</u>

SUMMER SESSION

(Ten weeks at sea on the T/S TEXAS CLIPPER)
NAUT 400 Advanced Communications, Navigation & Seamanship, Credit 4

SENIOR YEAR

Biol. 351 Fundamentals of Microbiology.....	(3-4)	4	Hist. 106 History of the U.S.	(3-0)	3
MARB 310 Introduction to Cell Biology.....	(3-3)	4	License Preparation†.....	(4-0)	R
NAUT 302 Seamanship III.....	(1-3)	2	MARB 420 Comparative Physiology.....	(3-3)	4
NAUT 404 The Navigator.....	(2-3)	3	MARB 435 Invertebrate Zoology....	(3-3)	4
Pol. S. 206 American National Government.....	(3-0)	3	MARB 450 Developmental Biology of Marine Organisms.....	(3-3)	4
Stat. 302 Statistical Methods.....	(2-2)	3			<u>15</u>
		<u>19</u>			

TOTAL HOURS — 151

*The American history requirement may be fulfilled by taking other American history courses offered at Texas A&M University at Galveston, including 370, 442, or 444. Students should consult with their academic advisor.

†License preparation consist of a series of non-credit review sessions designed to prepare students to sit for the U.S. Coast Guard licensing examination. Although license preparation is not a formal course, participation in the session requires up to four classroom hours per week.

NOTE: The license option in the Marine Biology curriculum is open only to U.S. Maritime Service cadets.

Curriculum in MARINE ENGINEERING (MARE)

The Marine Engineering program emphasizes the theory, design, operation and maintenance of maritime power plants and associated equipment. Engineering theory and practice are coordinated by relating classroom study to the student's practical experience aboard the **T/S TEXAS CLIPPER**. Thorough preparation in mathematics, sciences and basic and applied engineering subjects is recommended for students pursuing this degree program.

An option leading toward U.S. Coast Guard licensing is available to U.S. Maritime Service cadets through the Marine Engineering curriculum. The student who successfully completes the license program will be qualified to sit for the U.S. Coast Guard license examination for a license as a Third Assistant Engineer, Steam and Motor Vessels.

FRESHMAN YEAR

Fall Semester	(Th-Pr)	Cr	Spring Semester	(Th-Pr)	Cr
Chem. 101 Fundamentals of Chemistry I.....	(3-0)	3	Chem. 102 Fundamentals of Chemistry II.....	(3-0)	3
Chem. 111 Fundamentals of Chemistry Lab I.....	(0-3)	1	Chem. 112 Fundamentals of Chemistry Lab II.....	(0-3)	1
E.D.G. 105 Engineering Graphics ..	(0-6)	2	Hist. 106 History of the U.S.*.....	(3-0)	3
Engl. 103 Composition and Rhetoric.....	(3-0)	3	Math. 152 Engineering Mathematics II.....	(3-2)	4
Hist. 105 History of the U.S.*.....	(3-0)	3	NAUT 103E Maritime Orientation and Lifesaving.....	(2-3)	3
MARE 101 Engineering Analysis... (1-1)		1	Phys. 218 Mechanics.....	(3-3)	4
Math. 151 Engineering Mathematics I.....	(3-2)	4			18
		17			

SUMMER SESSION

(Ten weeks at sea in the T/S TEXAS CLIPPER)
MARE 200 Basic Operations, Credit 4

SOPHOMORE YEAR

Engl. 203 Introduction to Literature.....	(3-0)	3	MARE 206 Engineering Mechanics II.....	(3-0)	3
MARE 105 Engineering Mechanics I.....	(3-0)	3	MARE 207 Electricity & Magnetism.....	(3-2)	4
MARE 180 Basic Machine Shop Techniques.....	(0-3)	1	MARE 209 Mechanics of Materials.....	(3-0)	3
MARE 310 Engineering Computation.....	(3-0)	3	MARE 280 Welding Techniques.....	(0-3)	1
Math. 253 Engineering Mathematics III.....	(3-2)	4	MARE 303 Marine Thermodynamics I.....	(3-0)	3
Phys. 219 Electricity.....	(3-3)	4	Math. 308 Differential Equations ..	(3-0)	3
		18			17

SUMMER SESSION

(Ten weeks at sea in the T/S TEXAS CLIPPER)
MARE 300 Intermediate Operations, Credit 4

JUNIOR YEAR

C.E. 311 Fluid Dynamics.....	(3-0)	3	Engl. 301 Technical Writing.....	(3-0)	3
MARE 301 Heat Transfer.....	(3-2)	4	MARE 308 Electrical Machinery....	(3-2)	4
MARE 304 Marine Thermodynamics II.....	(3-0)	3	MARE 403 Engineering Laboratory I.....	(1-2)	2
MARE 307 Electrical Circuits.....	(3-2)	4	MARE 410 Marine Power Plants ...	(2-2)	3
Pol. S. 206 American National Government.....	(3-0)	3	MARE 412 Ship Structures and Stability.....	(3-0)	3
		17	MARE 415 Economics of Marine Engineering Systems Design	(3-0)	3
					18

SUMMER SESSION

(Ten weeks at sea in the T/S TEXAS CLIPPER)
MARE 400 Advanced Operations, Credit 4

SENIOR YEAR

MARE 210 Marine Construction Materials.....	(3-2)	4	Econ. 203 Principles of Economics.....	(3-0)	3
MARE 411 Marine Machine Design. (3-0)		3	MARE 203 Diesel Engineering Technology.....	(2-2)	3
MARE 414 Ship Automation I.....	(3-2)	4	MARE 416 Engineering Laboratory II.....	(0-4)	1
Elective (Social Science or Humanities)†.....		3	MARE 419 Marine Engineering Design Projects.....	(2-6)	4
Elective†.....		3	MARE 471 Ethics in Management and Engineering...	(3-0)	3
		17	Elective.....		3
					17

**TOTAL HOURS: LICENSE OPTION 151
NON-LICENSE OPTION 139**

*The American history requirement may be fulfilled by taking other American history courses offered at Texas A&M University at Galveston, including 370, 442, or 444. Students should consult with their academic advisor.

†N.S. 200 and 300 must be taken by Maritime Service license option students. Non-license students must take Pol. S. 207.

All electives must be chosen in consultation with, and approved by, the student's academic advisor.

NOTE: The license option of the Marine Engineering curriculum is open only to U.S. Maritime Service cadets.

Curriculum in MARINE FISHERIES (MARF)

The curriculum in marine fisheries provides educational opportunities in the biological sciences, with emphasis on principles of marine fisheries management. Ecology, taxonomy, zoogeography, culture and general biology of commercial species are stressed. Course offerings are structured to provide not only a strong basis of formal academic instruction but also considerable hands-on field and collection experience by taking advantage of the coastal location of the University. A strong preparation in the sciences is recommended.

Marine Fisheries graduates are prepared to work as fishery managers or research biologists for state and federal agencies, ecological consulting firms, industry and educational institutions. Qualified degree recipients may undertake postgraduate studies in resource management, mariculture, systematics, seafood technology and fisheries economics.

FRESHMAN YEAR

Fall Semester	(Th-Pr)	Cr	Spring Semester	(Th-Pr)	Cr
Biol. 113 Introductory Biology.....	(3-0)	3	Biol. 114 Introductory Biology.....	(3-0)	3
Biol. 123 Introductory Biology Lab .	(0-3)	1	Biol. 124 Introductory Biology Lab .	(0-3)	1
Chem. 101 Fundamentals of Chemistry I.....	(3-0)	3	Chem. 102 Fundamentals of Chemistry II.....	(3-0)	3
Chem. 111 Fundamentals of Chemistry Lab I.....	(0-3)	1	Chem. 112 Fundamentals of Chemistry Lab II.....	(0-3)	1
Engl. 103 Composition and Rhetoric.....	(3-0)	3	Engl. 104 Composition and Rhetoric.....	(3-0)	3
Hist. 105 History of the U.S.*.....	(3-2)	3	Hist. 106 History of the U.S.*.....	(3-0)	3
Math. 130 Mathematical Concepts — Pre-Calculus.....	(3-0)	3	Math. 230 Mathematical Concepts — Calculus.....	(3-0)	3
Naval Science or Elective†.....		1	Naval Science or Elective†.....		1
		18			18

SOPHOMORE YEAR

Chem. 227 Organic Chemistry I....	(3-0)	3	Chem. 228 Organic Chemistry II....	(3-0)	3
Chem. 237 Organic Chemistry Lab	(0-3)	1	Chem. 238 Organic Chemistry Lab	(0-3)	1
C.S. 203 Introduction to Computing.....	(3-0)	3	Econ 203 Principles of Economics.....	(3-0)	3
MARB 301 Genetics.....	(4-0)	4	MARB 315 Natural History of Vertebrates.....	(2-3)	3
MARF 201 Fisheries Conservation and Management.....	(3-0)	3	Phys. 202 College Physics.....	(3-3)	4
Phys. 201 College Physics.....	(3-3)	4	Stat. 302 Statistical Methods.....	(2-2)	3
Naval Science or Elective†.....		1	Naval Science or Elective†.....		1
		19			18

JUNIOR YEAR

Biol. 351 Fundamentals of Microbiology.....	(3-4)	4	MARB 312 Field Ichthyology.....	(1-6)	3
Engl. 301 Technical Writing.....	(3-0)	3	MARB 418 Fisheries Population Dynamics.....	(2-2)	3
Geol. 104 Physical Geology.....	(3-2)	4	Pol. S. 207 State and Local Government.....	(3-2)	3
MARB 311 Ichthyology.....	(2-3)	3	Elective (Botany)†.....		4
Pol. S. 206 American National Government.....	(3-0)	3	Elective (Fisheries/Marine Biology)†.....		3
		17			16

SENIOR YEAR

MARB 435 Invertebrate Zoology.....	(3-3)	4	MARB 420 Comparative Physiology.....	(3-3)	4
MARF 481 Seminar in Marine Fisheries.....	(1-0)	1	MARB 450 Developmental Biology of Marine Organisms.....	(3-3)	4
MARS 360 Biochemistry.....	(3-0)	3	MARF 445 Marine Fisheries Management.....	(2-2)	3
Elective (Fisheries/Marine Biology)†.....		3	MARF 481 Seminar in Marine Fisheries.....	(1-0)	1
Elective (Fisheries/Marine Biology)†.....		3	Elective (Fisheries/Marine Biology)†.....		3
		14			15

TOTAL HOURS — 135

*The American history requirement may be fulfilled by taking other American history courses offered at Texas A&M University at Galveston, including 370, 442, or 444. Students should consult with their academic advisor.

†All electives must be chosen in consultation with, and approved by, the student's academic advisor.



Curriculum in MARINE SCIENCES (MARS)

This program takes advantage of the coastal location of the University to provide the student with extensive hands-on experience in addition to a solid base of formal academic instruction in the science of the coastal, estuarine, and marine environments. This curriculum emphasizes mathematics, life sciences, physical sciences and earth sciences. Elective flexibility in the junior and senior years allows students the option to specialize in Marine Geology, Marine Chemistry or Marine Physics.

FRESHMAN YEAR

Fall Semester	(Th-Pr)	Cr	Spring Semester	(Th-Pr)	Cr
Biol. 113 Introductory Biology.....	(3-0)	3	Biol. 114 Introductory Biology.....	(3-0)	3
Biol. 123 Introductory Biology Lab.....	(0-3)	1	Biol. 124 Introductory Biology Lab.....	(0-3)	1
Chem. 101 Fundamentals of Chemistry I.....	(3-0)	3	Chem. 102 Fundamentals of Chemistry II.....	(3-0)	3
Chem. 111 Fundamentals of Chemistry Lab I.....	(0-3)	1	Chem. 112 Fundamentals of Chemistry Lab II.....	(0-3)	1
Engl. 103 Composition and Rhetoric.....	(3-0)	3	Engl. 104 Composition and Rhetoric.....	(3-0)	3
Math. 151 Engineering Mathematics I.....	(3-2)	4	Math. 152 Engineering Mathematics II.....	(3-2)	4
Naval Science or Elective*.....		1	Naval Science or Elective*.....		1
		16			16

SOPHOMORE YEAR

Chem. 227 Organic Chemistry I....	(3-0)	3	Chem. 228 Organic Chemistry II....	(3-0)	3
Chem. 237 Organic Chemistry Lab.....	(0-3)	1	Chem. 238 Organic Chemistry Lab.....	(0-3)	1
Hist. 105 History of the U.S.†.....	(3-0)	3	C.S. 203 Introduction to Computing.....	(3-0)	3
Math. 253 Engineering Mathematics III.....	(3-2)	4	Hist. 106 History of the U.S.†.....	(3-0)	3
Phys. 218 Mechanics.....	(3-3)	4	Phys. 219 Electricity.....	(3-3)	4
Pol. S. 206 American National Government.....	(3-0)	3	Pol. S. 207 State and Local Government.....	(3-0)	3
Naval Science or Elective*.....		1	Naval Science or Elective*.....		1
		19			18

JUNIOR YEAR

Econ. 203 Principles of Economics .	(3-0)	3	Computer Science Elective*.....		3
Engl. 301 Technical Writing.....	(3-0)	3	MARB 440 Marine Biology.....	(3-3)	4
Geog. 210 Marine Geography.....	(3-0)	3	MARS 310 Field Methods.....	(1-6)	3
Geol. 104 Physical Geology.....	(3-2)	4	Met. 302 Weather Reports and Forecasting.....	(3-0)	3
Stat. 302 Statistical Methods.....	(2-2)	3	Ocn. 401 Introduction to Oceanography.....	(3-0)	3
		16	Electives**.....		3
					19

SENIOR YEAR

MARS 481 Seminar in Marine Sciences.....	(1-0)	1	MARS 450 Electrical and Physical Measurements.....	(2-3)	3
MASE 375 Science of Fluids.....	(3-0)	3	MARS 485 Problems in Marine Sciences.....	(3-0)	3
MARS Options†.....	(3-0)	3	MARS Options‡.....	(3-0)	3
Electives*.....		9	Electives*.....		6
		16			15

TOTAL HOURS — 135

*All electives must be chosen in consultation with, and approved by, the student's academic advisor.

†The American history requirement may be fulfilled by taking other American history courses offered at Texas A&M University at Galveston, including 370, 442, or 444. Students should consult with their academic advisor.

‡MARS Option course must be chosen from: MARS 410, MARS 420, or MARS 430.



Curriculum in MARINE SCIENCES WITH A LICENSE OPTION

This program retains the basic physical science core of the Marine Sciences program but leads as well toward a U.S. Coast Guard license. This option is available to U.S. Maritime Service cadets in the Marine Sciences program. The student who successfully completes the license program will be qualified to sit for the U.S. Coast Guard examination for a license as a Third Mate of Ocean, Steam or Motor Vessels.

FRESHMAN YEAR

Fall Semester	(Th-Pr)	Cr	Spring Semester	(Th-Pr)	Cr
Biol. 113 Introductory Biology.....	(3-0)	3	Biol. 114 Introductory Biology.....	(3-0)	3
Biol. 123 Introductory Biology Lab.....	(0-3)	1	Biol. 124 Introductory Biology Lab.....	(0-3)	1
Engl. 103 Composition and Rhetoric.....	(3-0)	3	Engl. 104 Composition and Rhetoric.....	(3-0)	3
Hist. 105 History of the U.S.*.....	(3-0)	3	Math. 152 Engineering Mathematics II.....	(3-2)	4
Math. 151 Engineering Mathematics I.....	(3-2)	4	NAUT 203 Seamanship I.....	(2-3)	3
NAUT 103 Maritime Orientation and Lifesaving.....	(2-3)	3	NAUT 204 Terrestrial Navigation.....	(2-2)	3
		17			17

SUMMER SESSION

(Ten weeks at sea in the T/S TEXAS CLIPPER)
NAUT 200 Basic Communications, Navigation & Seamanship, Credit 4

SOPHOMORE YEAR

Chem. 101 Fundamentals of Chemistry I.....	(3-0)	3	Chem. 102 Fundamentals of Chemistry II.....	(3-0)	3
Chem. 111 Fundamentals of Chemistry Lab I.....	(0-3)	1	Chem. 112 Fundamentals of Chemistry Lab II.....	(0-3)	1
Math. 253 Engineering Mathematics III.....	(3-2)	4	C.S. 203 Introduction to Computing.....	(3-0)	3
NAUT 201 Naval Architecture I.....	(3-2)	4	NAUT 202 Naval Architecture II.....	(3-0)	3
N.S. 200 Merchant Marine Officer I.....	(3-0)	3	NAUT 303 Celestial Navigation.....	(2-3)	3
Phys. 218 Mechanics.....	(3-3)	4	Phys. 219 Electricity.....	(3-3)	4
		19			17

SUMMER SESSION

(Ten weeks at sea in the T/S TEXAS CLIPPER)
NAUT 300 Intermediate Communications, Navigation & Seamanship, Credit 4

JUNIOR YEAR

Engl. 301 Technical Writing.....	(3-0)	3	MART 321 Maritime Law I.....	(3-0)	3
Geol. 104 Physical Geology.....	(3-2)	4	NAUT 301 Seamanship II.....	(2-3)	3
MART 302 Maritime Cargo Operations I.....	(3-3)	4	NAUT 304 Electronic Navigation.....	(2-2)	3
Pol. S. 206 American National Government.....	(3-0)	3	N.S. 300 Merchant Marine Officer II.....	(3-0)	3
Stat. 302 Statistical Methods.....	(2-2)	3	Ocn. 401 Introduction to Oceanography.....	(3-0)	3
		17			15

SUMMER SESSION

(Ten weeks at sea in T/S TEXAS CLIPPER)
NAUT 400 Advanced Communications, Navigation & Seamanship, Credit 4
MARS 485 Problems in Marine Sciences, Credit 3

SENIOR YEAR

MARS 481 Seminar in Marine Sciences.....	(1-0)	1	Hist. 106 History of the U.S.*.....	(3-0)	3
MART 406 Maritime Cargo Operations II.....	(2-2)	3	License Preparation§.....	(4-0)	R
NAUT 302 Seamanship III.....	(1-3)	2	MARB 440 Marine Biology.....	(3-3)	4
NAUT 404 The Navigator.....	(2-3)	3	MARS 310 Field Methods in Marine Sciences.....	(1-6)	3
MARS Option†.....	(3-0)	3	Met. 302 Weather Reports and Forecasting.....	(3-0)	3
Elective‡.....		3	MARS Option†.....	(3-0)	3
		15			16

TOTAL HOURS — 148

*The American history requirement may be fulfilled by taking other American history courses offered at Texas A&M University at Galveston, including 370, 442, or 444. Students should consult with their academic advisor.

†MARS Option course must be chosen from: MARS 410, MARS 420, MARS 430, or MARS 450.

‡All electives must be chosen in consultation with, and approved by, the student's academic advisor.

§License preparation consist of a series of non-credit review sessions designed to prepare students to sit for the U.S. Coast Guard third mate licensing examination. Although license preparation is not a formal course, participation in the sessions requires up to four classroom hours per week.

NOTE: The license option in the Marine Sciences curriculum is open only to U.S. Maritime Service cadets.

Curriculum in MARINE TRANSPORTATION (MART)

This program combines studies in the humanities and sciences with instruction and training in maritime disciplines to provide the U.S. Maritime Service cadet with a broad-based education. The student who successfully completes the license program will be qualified to sit for the U.S. Coast Guard license examination for a license as a Third Mate of Ocean, Steam or Motor Vessels.

FRESHMAN YEAR

Fall Semester	(Th-Pr)	Cr	Spring Semester	(Th-Pr)	Cr
Chem. 106 Chemical Perspectives	(3-0)	3	Engl. 104 Composition and Rhetoric	(3-0)	3
Chem. 116 Chemical Perspectives Lab	(0-3)	1	Mgmt. 105 Introduction to Business	(3-0)	3
E.D.G. 105 Engineering Graphics	(0-6)	2	Math. 151 Engineering Mathematics I	(3-2)	4
Engl. 103 Composition and Rhetoric	(3-0)	3	NAUT 203 Seamanship I	(2-3)	3
Math. 106 Plane and Spherical Trigonometry	(4-0)	4	NAUT 204 Terrestrial Navigation	(2-2)	3
NAUT 103 Maritime Orientation and Lifesaving	(2-3)	3			16
		16			

SUMMER SESSION

(Ten weeks at sea in the T/S TEXAS CLIPPER)
NAUT 200 Basic Communications, Navigation & Seamanship, Credit 4

SOPHOMORE YEAR

Econ. 203 Principles of Economics	(3-0)	3	Econ. 204 Principles of Economics	(3-0)	3
Hist. 105 History of the U.S.*	(3-0)	3	NAUT 301 Seamanship II	(2-3)	3
Math. 152 Engineering Mathematics II	(3-2)	4	NAUT 303 Celestial Navigation	(2-3)	3
Met. 302 Weather Reports and Forecasting	(3-0)	3	N.S. 200 Merchant Marine Officer I	(3-0)	3
Phys. 201 College Physics	(3-3)	4	Phys. 202 College Physics	(3-3)	4
		17			16

SUMMER SESSION

(Ten weeks at sea in the T/S TEXAS CLIPPER)
NAUT 300 Intermediate Communications, Navigation, & Seamanship, Credit 4

JUNIOR YEAR

Econ. 321 International Trade and Finance	(3-0)	3	C.S. 203 Introduction to Computing	(3-0)	3
Hist. 106 History of the U.S.*	(3-0)	3	MART 321 Maritime Law I	(3-0)	3
MART 301 Ocean Transportation I	(4-0)	4	MART 406 Marine Cargo Operations II	(2-2)	3
MART 302 Marine Cargo Operations I	(3-3)	4	NAUT 202 Naval Architecture II	(3-0)	3
NAUT 201 Naval Architecture I	(3-2)	4	NAUT 304 Electronic Navigation	(2-2)	3
		18	N.S. 300 Merchant Marine Officer II	(3-0)	3
					18

SUMMER SESSION

(Ten weeks at sea in the T/S TEXAS CLIPPER)
NAUT 400 Advanced Communications, Navigation & Seamanship, Credit 4

SENIOR YEAR

MART 421 Maritime Law II	(3-0)	3	B. Ana. 303 Statistical Methods	(3-0)	3
NAUT 302 Seamanship III	(1-3)	2	Engl. 301 Technical Writing	(3-0)	3
NAUT 404 The Navigator	(2-3)	3	License Preparation†	(4-0)	R
Pol. S. 206 American National Government	(3-0)	3	MART 416 Port Operations Administration and Economics	(3-0)	3
Elective†		3	MART 481 Seminar	(0-2)	1
		14	Ocn. 401 Introduction to Oceanography	(3-0)	3
			Elective†		3
					16

TOTAL HOURS — 143

*The American history requirement may be fulfilled by taking other American history courses offered at Texas A&M University at Galveston, including 370, 442, or 444. Students should consult with their academic advisor.

†Electives must be chosen in consultation with, and approved by, the student's academic advisor.
‡License preparation consist of a series of non-credit review sessions designed to prepare students to sit for the U.S. Coast Guard third mate licensing examination. Although license preparation is not a formal course, participation in the sessions requires up to four classroom hours per week.



Curriculum in MARITIME ADMINISTRATION (MARA)

This curriculum, administered by the Department of Marine Transportation, is designed to prepare the graduate for administrative work in marine and maritime industries and/or governmental organizations involved in coastal, marine, and maritime activities. The curriculum provides a strong foundation in management, finance, business analysis, accounting, and economics. This business and administrative curriculum integrates with courses that specialize in marine and maritime activities such as port operations, brokerage and chartering, maritime law, and inland waterways.

FRESHMAN YEAR

Fall Semester	(Th-Pr)	Cr	Spring Semester	(Th-Pr)	Cr
American History*	(3-0)	3	American History*	(3-0)	3
Engl. 103 Composition and Rhetoric	(3-0)	3	C.S. 203 Introduction to Computing	(3-0)	3
Math. 130 Mathematical Concepts — Pre-Calculus	(3-0)	3	Engl. 104 Composition and Rhetoric	(3-0)	3
NAUT 103 Maritime Orientation and Lifesaving	(2-3)	3	Math. 230 Mathematical Concepts — Calculus	(3-0)	3
Science†		3	Science†		4
Naval Science or Elective‡		1	Naval Science or Elective‡		1
		<u>16</u>			<u>17</u>

SOPHOMORE YEAR

Acct. 229 Introduction to Accounting	(3-0)	3	Acct. 230 Introduction to Accounting	(3-0)	3
Econ. 203 Principles of Economics	(3-0)	3	Econ. 204 Principles of Economics	(3-0)	3
MARA 301 Ocean Transportation I	(4-0)	4	MARA 212 Business Law	(3-0)	3
NAUT 201 Naval Architecture	(3-2)	4	MART 304 Ocean Transportation II	(3-0)	3
Pol. S. 206 American National Government	(3-0)	3	Pol. S. 207 State and Local Government	(3-0)	3
Naval Science or Elective‡		1	Naval Science or Elective‡		1
		<u>18</u>			<u>16</u>

JUNIOR YEAR

B. Ana. 303 Statistical Methods	(3-0)	3	B. Ana. 364 Operations Management	(3-0)	3
Econ. 311 Money and Banking	(3-0)	3	Engl. 301 Technical Writing	(3-0)	3
MARA 363 The Organizing Process	(3-0)	3	Fin. 341 Business Finance	(3-0)	3
MART 421 Maritime Law II	(3-0)	3	MARA 401 Brokerage and Chartering	(3-0)	3
Mktg. 321 Marketing	(3-0)	3	Pol. S. 340 Introduction to Public Administration	(3-0)	3
Elective‡		3	Elective‡		3
		<u>18</u>			<u>18</u>

SENIOR YEAR

Acct. 327 Intermediate Accounting	(3-0)	3	B. Ana. 424 Economics of Transportation	(3-0)	3
B. Ana. 459 Analytical Models for Business Decisions	(3-0)	3	Econ. 412 Public Finance	(3-0)	3
Econ. 321 International Trade and Finance	(3-0)	3	MARA 435 Labor Relations Law	(3-0)	3
MARA 402 Inland Waterways	(3-0)	3	MARA 466 Management Policy	(3-0)	3
MARA 422 Personnel Management	(3-0)	3	MART 416 Port Operations, Administration and Economics	(3-0)	3
MARA 460 Management Systems and Control	(3-0)	3			<u>15</u>
		<u>18</u>			

TOTAL HOURS — 136

*American History. Must be chosen from those courses approved by the Chairman, Department of General Academics

†Any course in Biology, Chemistry, Physics, Geology or Geography 210, one of which must include a laboratory.

‡All electives must be chosen in consultation with, and approved by, the student's academic advisor.



Curriculum in MARITIME SYSTEMS ENGINEERING (MASE)

The Maritime Systems Engineering curriculum concentrates on fundamental engineering design in combination with humanities, sciences and various marine subjects. A general core of courses in humanities, sciences, and engineering during the freshman and sophomore years provides a foundation for specialization in one of the options during the junior and senior years. The program is designed to prepare students for work or further study in any marine-oriented engineering field. MASE graduates are also employed by organizations such as energy companies, shipyards, consulting firms, and research laboratories. A thorough preparation in mathematics, sciences and basic and applied engineering subjects is recommended for students pursuing this degree program.

FRESHMAN YEAR

Fall Semester	(Th-Pr)	Cr	Spring Semester	(Th-Pr)	Cr
Chem. 101 Fundamentals of Chemistry I.....	(3-0)	3	Chem. 102 Fundamentals of Chemistry II.....	(3-0)	3
Chem. 111 Fundamentals of Chemistry Lab I.....	(0-3)	1	Chem. 112 Fundamentals of Chemistry Lab II.....	(0-3)	1
E.D.G. 105 Engineering Graphics.....	(0-6)	2	E.D.G. 106 Engineering Design Graphics.....	(0-6)	2
Engl. 103 Composition and Rhetoric.....	(3-0)	3	Math 152 Engineering Mathematics II.....	(3-2)	4
MARE 101 Engineering Analysis.....	(0-3)	1	MASE 100 Introduction to Maritime Systems Engineering.....	(2-3)	3
Math. 151 Engineering Mathematics I.....	(3-2)	4	Phys. 218 Mechanics.....	(3-3)	4
Naval Science or Elective*		1	Naval Science or Elective*		1
		15			18

SOPHOMORE YEAR

Econ. 203 Principles of Economics.....	(3-0)	3	Engl. 203 Introduction to Literature.....	(3-0)	3
Hist. 105 History of the U.S.†.....	(3-0)	3	MARE 206 Engineering Mechanics II.....	(3-0)	3
MARE 105 Engineering Mechanics I.....	(3-0)	3	MARE 209 Mechanics of Materials.....	(3-0)	3
Math. 253 Engineering Mathematics III.....	(3-2)	4	MARE 303 Thermodynamics I.....	(3-0)	3
NAUT 201 Naval Architecture I.....	(3-2)	4	MARE 310 Engineering Computations.....	(3-0)	3
Naval Science or Elective*		1	Math. 308 Differential Equations.....	(3-0)	3
		18	Naval Science or Elective*		1
					19

JUNIOR YEAR

MARE 210 Marine Construction Materials.....	(3-2)	4	Hist. 106 History of the U.S.†.....	(3-0)	3
Phys. 219 Electricity.....	(3-3)	4	O. E. 462 Hydromechanics.....	(3-0)	3
Option Requirements‡.....		10	Option Requirements‡.....		12
		18			18

SENIOR YEAR

Engl. 301 Technical Writing.....	(3-0)	3	O.E. 401 Measurements in the Ocean.....	(3-0)	3
O.E. 300 Dynamics of Waves and Structures I.....	(3-0)	3	O.E. 410 Measurements in the Ocean Lab.....	(0-3)	1
Pol. S. 206 American National Government.....	(3-0)	3	Pol. S. 207 State and Local Government.....	(3-0)	3
Option Requirements*.....		6	Option Requirements‡.....		9
		15			16

It should be noted that the factors of supply and demand will govern the offering of specific courses and options at Galveston. It may be necessary for some of the courses to be taken at College Station.

OCEAN ENGINEERING OPTION REQUIREMENTS

C.E. 311 Fluid Dynamics.....	(3-0)	3
C.E. 345 Theory of Structures.....	(0-3)	3
C.E. 365 Introduction to Geotechnical Engineering.....	(2-2)	3
Geol. 320 Geology for Civil Engineering.....	(2-2)	3
MARE 207 Electricity and Magnetism.....	(3-2)	4
MARS 410 Physical Processes in the Marine Environment.....	(3-0)	3
MARS 430 Geological Processes in the Marine Environment.....	(3-0)	3
MASE 461 Electronic Instrumentation.....	(2-3)	3
O.E. 400 Basic Coastal Engineering.....	(3-0)	3
Life Science Elective.....		3
Elective (Social Sciences)*.....		3
Elective (Technical)*.....		3
		37

COASTAL STRUCTURES OPTION REQUIREMENTS

C.E. 336 Fluid Dynamic Lab.....	(0-2)	1
C.E. 344 Reinforced Concrete Structures.....	(2-3)	3
C.E. 345 Theory of Structures.....	(3-0)	3
C.E. 346 Structural Steel Design.....	(2-3)	3
C.E. 365 Introduction to Geotechnical Engineering.....	(2-2)	3
C.E. 435 Geotechnical Engineering Design.....	(2-3)	3
C.E. 483 Analysis and Design of Structures.....	(2-3)	3
Geol. 320 Geology for Civil Engineers.....	(2-2)	3
MARE 412 Ship Structures and Stability.....	(3-0)	3
MASE 411 Advanced Hydrodynamics I.....	(3-0)	3
MASE 415 Marine Structures Design.....	(3-0)	3
MARE 344 Fluid Mechanics.....	(3-0)	3
MARE 459 Mechanical Vibration.....	(3-0)	3
		37

HYDROMECHANICS OPTION REQUIREMENTS

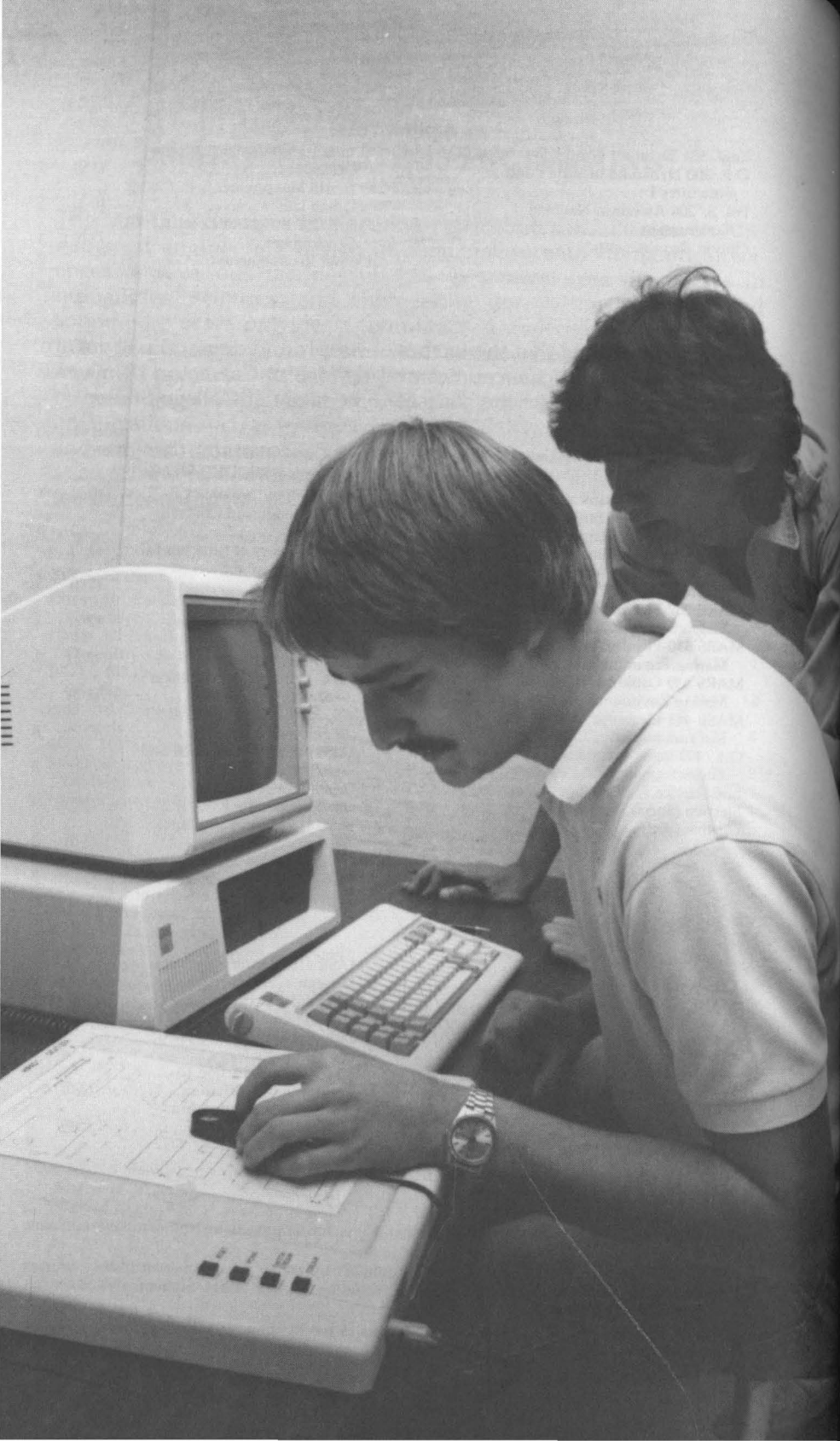
C.E. 311 Fluid Dynamics.....	(3-0)	3	MASE 415 Marine Structures Design.....	(3-0)	3
C.E. 336 Fluid Dynamics Lab.....	(0-2)	1	MASE 461 Electronic Instrumentation.....	(2-3)	3
MARE 301 Heat Transfer.....	(3-0)	3	Math. 311 Topics in Applied Mathematics I.....	(3-0)	3
MARE 207 Electricity and Magnetism.....	(3-2)	4	M.M. 460 Introduction to Continuing Mechanics.....	(3-0)	3
MARS 410 Physical Processes in the Marine Environment.....	(3-0)	3	Ocn. 401 Introduction to Oceanography.....	(3-0)	3
MASE 411 Advanced Hydrodynamics I.....	(3-0)	3	Electives*.....		2
MASE 412 Advanced Hydrodynamics II.....	(3-0)	3			37

TOTAL HOURS — 137

*All electives must be chosen in consultation with, and approved by, the student's academic advisor.

†The American history requirement may be fulfilled by taking other American history courses offered at Texas A&M University at Galveston, including 370, 442, or 444. Students should consult with their academic advisor.

‡Option Requirements — There are three options to the Maritime Systems Engineering Degree Program: Ocean Engineering, Coastal Structures and Hydromechanics.



COURSE DESCRIPTIONS

All undergraduate courses offered at the University are described on the following pages and are listed by departments, arranged alphabetically.

The course numbering scheme is as follows:

- 100 to 199, courses primarily open to freshmen.
- 200 to 299, courses primarily open to sophomores.
- 300 to 399, courses primarily open to juniors.
- 400 to 499, courses primarily open to seniors.

Figures in parentheses following the number of the courses indicate the clock hours per week devoted to theory and practice, respectively. Theory includes recitations and lectures; practice includes work done in the laboratory, shop, drawing room or field. The unit of credit is the semester hour, which involves one hour of theory, or from two to four hours of practice per week for one semester of 16 weeks.

When courses are cross-listed (e.g. offered as MARB 435 at TAMUG and Biol. 435 at TAMU), credit cannot be received for both courses.

Any course may be withdrawn from the session offerings in case the number of registrations is too small to justify the offering of the course.

ACCOUNTING (Acct.)

- 229. Introductory Accounting. (3-0). Credit 3.** Analysis, recording and reporting of business transactions; partnership and corporation accounting; analysis and use of financial statements. Prerequisite: Major in business administration or approval of department head.
- 230. Introductory Accounting. (3-0). Credit 3.** Continuation of Acct. 229. Use of budgets; introduction to cost accounting; cost control techniques and methods of measuring performance. Prerequisite: Acct. 229.
- 327. Intermediate Accounting. (3-0). Credit 3.** Application of generally accepted principles of accounting for business enterprises with emphasis on corporations. Prerequisite: Acct. 230.

BIOLOGY (Biol.)

- 113. Introductory Biology. (3-0). Credit 3.** Survey of structures and functions common to living forms in general. Principles of cell biology; regulation of growth and development, reproduction, evolution and ecology. Laboratory (Biol. 123) is optional.
- 114. Introductory Biology. (3-0). Credit 3.** Survey of major groups of living forms; their special structures and functions which enable them to exist. Survey includes prokaryotes, fungi, lower and higher plants, animals and humans. Laboratory (Biol. 124) is optional. Prerequisite: Biol. 113.
- 123. Introductory Biology Laboratory. (0-3). Credit 1.** Laboratory supporting Biol. 113. Prerequisite: Biol. 113 or registration therein.
- 124. Introductory Biology Laboratory. (0-3). Credit 1.** Laboratory supporting Biol. 114. Prerequisite: Biol. 113.
- 351. Fundamentals of Microbiology. (3-4). Credit 4.** Basic microbiology; comparative morphology, taxonomy, pathogenesis, ecology, variation, physiology of microorganisms. Prerequisites: Chem. 227, 237; three hours of biology; or approval of instructor.
- 466. Principles of Evolution. (3-0). Credit 3.** Evolutionary patterns, mechanisms and processes at the organismal, chromosomal and molecular levels; modes of adaptation and the behavior of genes in populations. Prerequisite: Nine hours of biological science or approval of instructor.
- 485. Biological Problems. Credit 1 or more.** Problems in various phases of plant, animal and bacteriological science. Prerequisites: Junior classification; approval of ranking professor in field chosen or department head.

BUSINESS ANALYSIS (B.Ana.)

- 303. Statistical Methods (3-0). Credit 3.** Collection, tabulation and presentation of numerical data. Sampling, estimation of averages and variation, probability and error, hypothesis testing and correlation. Prerequisite: Math. 230.

- 304. Business Cycles and Business Measurement. (3-0). Credit 3.** Empirical and statistical study of economic fluctuations: business barometers and forecasting; statistical techniques for preparing individual organizational forecasts and long-range plans. Prerequisites: B.Ana. 303 or equivalent.
- 305. Advanced Business Analysis. (3-0). Credit 3.** Selected topics in statistical analysis, practical applications to functional problems in accounting, finance, marketing and management. Applications of existing computer programs minimize computations. Prerequisite: B.Ana. 217, C.S. 203, or equivalent and B.Ana. 303 or equivalent.
- 317. Business Problem Programming. (2-2). Credit 3.** Combination of programming and systems analysis in problem definition and solution with FORTRAN programming. Case problems will be analyzed and programmed in the functional fields of business. Prerequisites: B.Ana. 217, 303, C.S. 203, or approval of instructor.
- 364. Operations Management. (3-0). Credit 3.** Concepts, issues and techniques used to plan, analyze and control systems of production. Operational programs in producing goods and services. Prerequisites: B.Ana. 217 or C.S. 203, and B.Ana. 303.
- 424. Economics of Transportation. (3-0). Credit 3.** Historical development, structure, function and regulation of highway, rail, water, pipeline, and air transportation systems. Application of economic concepts and principles to transportation development and operations. Prerequisite: Econ. 204. Cross-listed with Econ. 424
- 459. Analytical Models for Business Decisions. (3-0). Credit 3.** The application of quantitative decision-making techniques to management decision problems. Primary emphasis on the planning, analysis and control of operating systems in organizational settings. Prerequisite: B.Ana. 364.
- 485. Problems. Credit 1 to 4 each semester.** Directed study of selected problems in an area of business data processing and business analysis.

CHEMISTRY (Chem.)

- 101. Fundamentals of Chemistry I. (3-0). Credit 3.** Introduction to modern theories of chemical bonding; chemical reactions; states of matter; solutions and colloids; stoichiometry and equilibrium. Prerequisite: Chem. 111 or registration therein.
- 102. Fundamentals of Chemistry II. (3-0). Credit 3.** Theory and applications of oxidation-reduction systems; complex equilibria; descriptive inorganic and organic chemistry; introduction to chemical instrumentation; selected topics in biochemistry and nuclear chemistry. Prerequisites: Chem. 101, 111, and 112 or registration therein.
- 106. Chemical Perspectives. (3-0). Credit 3.** Structure of atoms, the periodic chart and principles of chemical bonding. Compounds and their uses in everyday life. Not intended for those who plan to pursue advanced work in the sciences. Prerequisite: Chem. 116 or registration therein.
- 111. Fundamentals of Chemistry Laboratory I. (0-3). Credit 1.** Introduction to methods and techniques of chemical experimentation; qualitative and semi-quantitative procedures applied to investigative situations. Prerequisite: Chem. 101 or registration therein.

- 112. Fundamentals of Chemistry Laboratory II. (0-3). Credit 1.** Introduction to analytical and synthetic methods and to quantitative techniques to both inorganic and organic compounds with emphasis on an investigative approach. Prerequisites: Chem. 101, 111; Chem. 102 or registration therein.
- 116. Chemical Perspectives Laboratory. (0-3). Credit 1.** Introduction to chemical laboratory work with experiments to show the applications of chemistry to everyday life. Prerequisite: Chem. 106 or registration therein.
- 227. Organic Chemistry I. (3-0). Credit 3.** Introduction to chemistry of compounds of carbon. General principles and their application to various industrial and biological processes. Prerequisite: Chem. 102 or 104 or equivalent.
- 228. Organic Chemistry II. (3-0). Credit 3.** Continuation of Chem. 227. Prerequisite: Chem. 227.
- 237. Organic Chemistry Laboratory. (0-3). Credit 1.** Operations and techniques of elementary organic chemistry laboratory. Preparation, reactions and properties of representative organic compounds. Prerequisites: Chem. 112 or 114; Chem. 227 or registration therein.
- 238. Organic Chemistry Laboratory. (0-3). Credit 1.** Continuation of Chem. 237. Prerequisites: Chem. 237; Chem. 228 or registration therein.
- 383. Chemistry of Environmental Pollution. (3-0). Credit 3.** Chemical pollutants in the air, in water and on land: their generation, chemical reactivity, action on environment and disappearance through chemical mechanisms. Chemistry of existing pollution abatement. Prerequisite: Chem. 228 or equivalent.
- 485. Problems. Credit 1 or more.** Introduction to research, library and laboratory work. Prerequisites: Senior classification; approval of department head.

CIVIL ENGINEERING (C.E.)

- 311. Fluid Dynamics. (3-0). Credit 3.** Fluid properties; statics; kinematics; basic conservation principles of continuity, energy and momentum; similitude and hydraulic models; incompressible flow in pipes; fluid dynamic drag. Prerequisite: MARE 206 or equivalent.
- 336. Fluid Dynamics Laboratory. (0-2). Credit 1.** Introduction to laboratory techniques, calibration principles, reports and fluid measurements. Determination of fluid properties. Visualization of types of flow. Experiments in closed conduit flow of air, water and oil. Fluid drag and turbomachinery tests. Open channel and gravity wave demonstrations. Prerequisite: C.E. 311 or registration therein.
- 344. Reinforced Concrete Structures. (2-3). Credit 3.** Analysis and design to reinforce concrete beams, columns, slabs and footings using elastic and ultimate strength methods. Prerequisite: C.E. 345.

- 345. Theory of Structures. (3-0). Credit 3.** Structural engineering — functions of structure, design loads, reactions and force systems. Analysis of statically determinate structures; including beams, trusses and arches. Methods of determining deflections of structures. Influence lines and criteria for moving loads. Analysis of indeterminate structures; including continuous beams and frames. Prerequisite: C.E. 205 or equivalent.
- 346. Structural Steel Design. (2-3). Credit 3.** Materials, types of members and typical arrangements. Design of tension members, compression members, beams and beam columns. Design of bolted connections and welded connections. Theory and practice as indicated in typical current specifications. Prerequisite: C.E. 345.
- 365. Introduction to Geotechnical Engineering. (2-2). Credit 3.** Physical properties of soils, classification systems, soil exploration, permeability, consolidation, compaction and shear strength. Laboratory tests conducted to determine the physical and engineering soil properties needed for application in geotechnical engineering design. Prerequisite: Geol. 320.
- 435. Geotechnical Engineering Design. (2-3). Credit 3.** A design course covering prediction of settlement, analysis of the stability of slopes, prediction of bearing capacity of shallow and deep foundations, and determination of pressures acting on retaining structures. A general course in geotechnical engineering design for undergraduates and for graduate students not primarily interested in the geotechnical field, but desiring additional study beyond the introductory undergraduate level. Prerequisite: C.E. 365.
- 483. Analysis and Design of Structures. (2-3). Credit 3.** Overall procedure of analysis and design; including functions, loads, layouts of force systems; analysis, design drafting, specifications, cost comparisons and maintenance as applied to typical simple bridge and building structures. Prerequisites: C.E. 344, 346, 365.
- 485. Problems. Credit 1 to 3 each semester.** Research and design problems of limited scope approved on an individual basis intended to promote independent study. Results of study presented in writing. Prerequisite: Approval of department head.

COMPUTING SCIENCE (C.S.)

- 201. Computer Programming for Engineers. (1-0). Credit 1.** Programming using the FORTRAN language. Actual writing of typical programs and running them on the computer.
- 203. Introduction to Computing. (3-0). Credit 3.** Algorithms, programs and computers. Basic programming and program structure. Data representation. Computer solution of numerical and non-numerical problems using a high-level programming language, FORTRAN.
- 485. Problems. Credit 1 to 3.** Permits work on special project in computing science. Project must be approved by department head. Prerequisite: Senior classification.

ECONOMICS (Econ.)

- 203. Principles of Economics. (3-0). Credit 3.** Elementary principles of economics; the economic problem, measurement and determination of national income, money and banking, theory of price. Prerequisite: Sophomore classification.

- 204. Principles of Economics. (3-0). Credit 3.** Analysis of economic aggregates, theory of production and of the firm, international economic relations and labor problems. Prerequisite: Econ. 203.
- 311. Money and Banking. (3-0). Credit 3.** Fundamental principles of money, credit and banking and their exemplification in modern currency and banking history. Prerequisite: Econ. 204.
- 321. International Trade and Finance. (3-0). Credit 3.** Theory of international trade, barriers to trade, balance of payments and foreign exchange analysis, current policy problems. Prerequisite: Econ. 204.
- 412. Public Finance. (3-0). Credit 3.** Economic role of governments, with emphasis on the choice of public sector output in a democracy and the effects of various taxes on resource allocation and income distribution. Prerequisite: Econ. 204.
- 485. Problems. Credit 1 to 3.** Research and design of specific problem areas approved on an individual basis with the intention of promoting independent study and to supplement existing course offerings. Results of study presented in writing. Prerequisite: Approval of department head.
- 489. Special Topics in Credit 1 to 4.** Selected topics in an identified area of economics. Prerequisite: Approval of department head.

ENGINEERING DESIGN GRAPHICS (E.D.G.)

- 105. Engineering Graphics. (0-6). Credit 2.** Introduction to the graphical approach to the engineering design process as applied to elementary systems. Methods of graphical communications, working drawings, data analysis, technical reports, oral presentations. Introduction to team organization and creative problem solving.
- 106. Engineering Design Graphics. (0-6). Credit 2.** Introduction to engineering design; product development and team dynamics using graphical methods and descriptive geometry. Spatial analysis of geometric elements, vectors, data analysis and graphical applications to a variety of engineering areas. Prerequisite: E.D.G. 105.
- 309. Blueprint Analysis. (3-0). Credit 3.** Analysis of industrial blueprints for basic dimensions, materials and location. Preparation of material schedules and quantity estimates from prepared drawings. Critical path scheduling of materials procurement as indicated by blueprints. Preparation of necessary production or process drawings.
- 485. Problems. Credit 1 to 3 each semester.** Special problems to fit needs of individual students. Prerequisite: Approval of instructor.

ENGLISH (Engl.)

- 103. Composition and Rhetoric. (3-0). Credit 3.** Composition of short papers, with emphasis on sentence structure, paragraph development and paper organization. Analysis of expository prose.
- 104. Composition and Rhetoric. (3-0). Credit 3.** Continuation of Engl. 103. More complex methods of paper development; investigative papers. Readings in prose. Prerequisite: Engl. 103 or advanced standing.

203. Introduction to Literature. (3-0). Credit 3. Reading of literature: plays, stories, novels and poems, chiefly modern; practice in literary analysis and interpretation. Prerequisite: Completion of freshman writing requirement.

212. Shakespeare. (3-0). Credit 3. Major plays of Shakespeare with lectures on his art, his language and his cultural environment. Prerequisite: Completion of freshman writing requirement.

301. Technical Writing. (3-0). Credit 3. Advanced writing in technical, scientific and business fields; reports, proposals and other papers; correspondence. Prerequisite: Engl. 104; junior classification in the major department or approval of instructor.

335. Literature of the Sea. (3-0). Credit 3. Significance of the sea in fictional and factual accounts, such as novels, short stories, poems, and narratives of sailors and seafaring life. Prerequisite: Completion of freshman writing requirement.

485. Problems. Credit 1 to 3. Readings for specific needs of major or minor in English. Prerequisite: Approval of department head.

489. Special Topics in . . . Credit 1 to 4. Selected topics in an identified area of English language and literature. May be repeated for credit. Prerequisite: Approval of instructor.

FINANCE (Fin.)

341. Business Finance. (3-0). Credit 3. Financial practices and financial management of modern business corporations; cash flow, planning, procurement of funds, management of long-term funds and working capital. Prerequisites: Econ. 203 and Acct. 229 or equivalent.

434. Managerial Finance I. (3-0). Credit 3. Managerial problems of financial managers, financial analysis, current asset management, capital budgeting and capital structure. Prerequisite: Fin. 341.

435. Managerial Finance II. (3-0). Credit 3. Case studies in the administration of the financial affairs of business enterprises. Working capital management, capital expenditure analysis, capital structure, and mergers and acquisitions. Prerequisite: Fin. 434.

445. Funding International Business. (3-0). Credit 3. Analysis of international business transactions, sources of funding, relation to international financial institutions and capital instruments. Relates international business funding to national and commercial development. Prerequisites: Econ. 311, Fin. 341.

GENERAL ACADEMICS (GACD)

311. Library Resources: The Library and Learning. (1-2). Credit 2. Designed to acquaint the student with the university library and its resources and to develop research skills at the upper level. Emphasis placed on specialized reference tools.

315. Information Sources in Marine Sciences. (2-0). Credit 2. An in-depth study of scientific information sources. Designed to develop skill in question formulation, abstracting and scientific literature searching.

330. Southern American Folklore. (3-0). Credit 3. Elements of southern folklore and music. Includes study of Southern and Maritime Folklore, beliefs and customs, ballads, folk songs and sea shanties. Individual collecting. Prerequisite: Completion of freshman writing requirement.

GENETICS (Gen.)

485. Problems. Credit 1 to 4 each semester. Special problems for advanced undergraduates permitting laboratory investigations of subject matter not included in established courses. Prerequisites: Gen. 301 or 310 and approval of instructor or department head.

GEOGRAPHY (Geog.)

201. Introduction to Human Geography. (3-0). Credit 3. A comparative survey of the major cultural regions of the world and their dissimilar development, the processes of innovation, diffusion and adaptation with regard to changing relationships between people and their environment.

210. Marine Geography. (3-0). Credit 3. Introduction to the physical and cultural patterns of the coastal zones of the world. Interrelationships between the physical forms and processes and the cultural patterns used to analyze the human use and abuse of the sea.

315. Geography of the Sea. (3-0). Credit 3. Introduction to principal characteristics and problems of human use of the sea. Watercraft, exploration, fisheries, minerals, law of the sea, world shipping.

380. Workshop in Environmental Studies. (1-2 to 8). Credit 2 to 6. Study, understanding and solution of real human environment problems based on principles learned in the classroom. Library, laboratory and field work carried out by individuals and in groups; reports on work accomplished. May be repeated for credit as many as three times. Prerequisite: Approval of department head.

485. Problems. Credit 1 or more each semester. Individually supervised research or advanced study on restricted areas not covered in regular courses. Prerequisite: Approval of department head.

GEOLOGY (Geol.)

101. Principles of Geology. (3-2). Credit 4. General principles of physical geology; structure of the earth, origin of minerals and rocks and geologic processes; synthesis of geologic ideas and introduction to geologic practice. This course does not involve rigorous mathematical or chemical treatment of the subjects but may be used for fulfillment of laboratory science requirements.

104. Physical Geology. (3-2). Credit 4. Earth materials, structures, external and internal characteristics; physical processes at work upon or within the planet. A working knowledge of high school chemistry and mathematics is required.

- 106. Historical Geology. (3-2). Credit 4.** Introduction to historical geology; review of hypothesis of earth's origin, significance of fossils, origin and character of selected geologic formations, and development of North American continent. Prerequisite: Geol. 101, 104 or 320 or approval of department head.
- 203. Crystallography and Mineralogy. (2-6). Credit 4.** Crystallography and descriptive mineralogy. Sight recognition of crystal forms and of common minerals. Prerequisites: Chem. 102 or 104. Math. 121 or 151.
- 306. Stratigraphy and Sedimentation. (3-3). Credit 4.** Principles of stratigraphy and study of environments of deposition. Laboratory work in sampling, analyzing and interpreting sedimentary rocks. Field trips required. Prerequisites: Geol. 245, 303, or approval of department head.
- 320. Geology for Civil Engineers. (2-2). Credit 3.** Principles of physical geology; common minerals and rocks with their relationships and applications to construction, foundations and excavation. Prerequisite: Sophomore classification.
- 485. Problems. Credit 1 or more each semester.** Advanced problems in geology. Prerequisite: Approval of department head.

HISTORY (Hist.)

- 105. History of the United States. (3-0). Credit 3.** English colonization; Revolution; adoption of Constitution; growth of nationalism and sectionalism; cotton and slavery problem; Civil War; reconstruction.
- 106. History of the United States. (3-0). Credit 3.** Since reconstruction; new social and industrial problems; rise of progressivism; United States emergence as world power; World War I; reaction and New Deal, World War II; contemporary America.
- 370. Civil War and Reconstruction. (3-0). Credit 3.** Survey of background and causes of the war; military, political, economic and diplomatic aspects of the war; life behind the lines; reconstruction and post-war adjustments, 1861-1877.
- 442. History of American Sea Power. (3-0). Credit 3.** Development of American sea power from the 18th century to the present.
- 444. American Military History Since 1901. (3-0). Credit 3.** Intensive study of American military experience from 1901 to present; causes, nature and effect of wars in which the United States has participated. Close attention given to effect of war on American history.
- 464. International Developments Since 1918. (3-0). Credit 3.** General survey of world politics since close of World War I. Problems and ideologies of great powers of Europe and those factors and conditions which explain present political tendencies and policies.
- 485. Problems. Credit 1 to 3.** Selected fields of history not covered in depth by other courses. Reports and extensive reading required. Prerequisite: Approval of department head.
- 489. Special Topics in . . . Credit 1 to 4.** Study of selected topics in an identified area of history.

MANAGEMENT (Mgmt.)

- 105. Introduction to Business. (3-0). Credit 3.** Over-all picture of business operation; includes analysis of specialized fields within business organizations; identifies role of business in modern society. American business system; legal environment; forms of business ownership; organizational structures; human resource management; labor-management relations; marketing, accounting, production, logistics, and financial functions. Limited to students in freshman or sophomore classification.
- 363. The Organizing Process. (3-0). Credit 3.** Management as an academic discipline is defined and its evolution sketched. Goal setting; planning, controlling and decision-making; models for thinking about organizations; organization design; organization change; models for understanding individual behavior; job performance and job satisfaction; interpersonal behavior, motivation and leadership, behavior in work groups; and careers in management. Cross-listed with MARA 363. Prerequisite: Junior classification.
- 402. Business Enterprise Simulation. (3-0). Credit 3.** Integrates functional areas of a business enterprise into a unified whole through the use of a computerized business game. Decision-making and administrative processes in a competitive market; market analysis and forecasting; goal-setting and policy formulation for the firm; interrelationships of production, marketing, financing, and controlling functions; investments in a simulated stock market. Course is experiential in nature. Prerequisites: Mgmt. 363, Mktg. 321, B.Ana. 303, Fin. 341, senior classification in College of Business Administration, or approval of instructor.
- 422. Personnel Management. (3-0). Credit 3.** Relationship of the personnel function to the whole organization; manpower planning; recruitment; selection including employment application, interviewing, testing, reference checks, probationary period; placement; separation; compensation; training; performance appraisal; labor relations; and safety. Cross listed with MARA 422. Prerequisite: Mgmt. 363 or approval of instructor.
- 435. Labor Law and Policy. (3-0). Credit 3.** Federal and state public policy and law regulating collective bargaining and issues in employment discrimination law. Legal environment of labor relations; conspiracy doctrine applied to labor union; labor injunctions; Norris-LaGuardia Act; Wagner Act; Taft-Hartley Act; National Labor Relations Board; control of bargaining unit; strikes, lockouts and picketing; secondary boycotts; National Emergency Labor Disputes; Landrum Griffin Act; legal bases of public sector unionism; race, sex and religious discrimination in employment. Prerequisite: Senior classification or approval of instructor. Cross listed with MARA 435.
- 460. Management Systems and Control. (3-0). Credit 3.** Applications of management planning and control techniques to complex organizational problems and management decision making tasks; socio-technical work systems and human-machine systems; basic systems theory and concepts; basic control theory and concepts; systems design process; systems analysis techniques such as simulation models and sensitivity analysis; information technology and management information systems; program and project management; special-purpose planning and control systems. Cross-listed with MARA 460. Prerequisites: B.Ana. 317, 364 and Mgmt. 363 or approval of instructor.

- 466. Management Policy. (3-0). Credit 3.** Policy problems of business organizations; top management problem-solving and decision-making; planning; appraising the business environment; the firm's financial, human and physical resources; forecasting; developing objectives and strategies; evaluating alternatives; implementing strategies; measuring results; profitably and social responsibility. Use of case analysis. Cross-listed with MARA 466. Prerequisites: Mgmt. 363 and senior classification in business administration.
- 489. Special Topics in . . . Credit 1 to 4.** Selected area in management. Consult the professor offering a particular special topics course for details. May be repeated for credit. Prerequisite: Approval of instructor.

MARINE BIOLOGY (MARB)

- 301. Genetics. (4-0). Credit 4.** Fundamental principles of genetics: physical basis of Mendelian inheritance, expression and interaction of genes, linkage, sex linkage, biochemical nature of genetic material and mutation. Prerequisites: Biology 113 and 114 and at least sophomore classification.
- 310. Introduction to Cell Biology. (3-3). Credit 4.** Introduction to the basic principles of cell structure and function. Molecular components of the cell, methods for study of the cell, structural bases of the cell cytoplasm and cytoplasmic organelles and their structure and function with particular emphasis on nucleus. Prerequisites: Biol. 113 or 114 and Chem. 228.
- 311. Ichthyology. (2-3). Credit 3.** Freshwater and marine fishes. Subject will be mainly systematic, but evolution, ecology, life history and economics of more important species will be treated. Prerequisites: Biol. 318 or MARB 315, or W.F.S. 302 or equivalent.
- 312. Field Ichthyology. (1-6). Credit 3.** Field and laboratory studies on identification and ecology of freshwater and marine fishes of Texas. Field trips required. Prerequisite: MARB 311.
- 315. Natural History of the Vertebrates. (2-3). Credit 3.** Natural history of fishes, amphibians, reptiles, birds and mammals, with emphasis on coastal Texas vertebrates. Prerequisites: Biol. 114 and Biol. 124 or approval of instructor.
- 320. Marine Food Chains. (2-3). Credit 3.** Examination of basic food chain concepts, including ecosystem roles, trophic levels and structure, energy and energy flows, and biogeochemical cycles. Methods of marine food chain analysis are considered in detail as well as exemplary marine food chain studies reported in the literature. Prerequisites: Biol. 114 and 124 and junior classification or approval of instructor.
- 408. Biology of the Algae. (3-3). Credit 4.** Morphology, taxonomy, ecology and phylogeny of the freshwater and marine algae. Prerequisites: Biol. 113 and 114 or approval of instructor.
- 410. Animal Behavior. (2-3). Credit 3.** Examination of ethological concepts. Discussion of the development, genetics, physiology and evolution of animal behavior patterns involved in reproduction, territoriality, aggression, communication, population dispersion, sociality and sociobiology of invertebrates and vertebrates. Prerequisites: Biol. 114 and 124 or approval of instructor.

- 415. Invertebrate Fisheries. (2-2). Credit 3.** Fisheries of invertebrates as opposed to invertebrate culture. History, present importance and future outlook of invertebrates in the fisheries of various countries. Emphasis on commercial invertebrate fisheries in the United States and Texas. Prerequisite: A course in invertebrate zoology.
- 418. Fisheries Population Dynamics. (2-2). Credit 3.** Recruitment, growth, natural mortality and exploitation of populations; implications to management of commercial fisheries. Prerequisites: Stat. 201 or 302; Math. 230; or approval of instructor.
- 420. Comparative Physiology. (3-3). Credit 4.** Principles of animal physiology. Vertebrates and invertebrates will be studied with particular emphasis on marine species. Basic concepts of osmotic and ionic regulation, excretion, respiration, metabolism, nervous integration, muscles, hormones and homeostasis. Prerequisites: 12 hours of biological sciences; Chem. 228.
- 425. Marine Ecology. (2-3). Credit 3.** Relationship between various marine environments and their inhabitants; intra- and interspecific relationships between organisms; structure and function among marine communities. Laboratory emphasis is placed on study of living material and natural habitats in the Gulf of Mexico. Prerequisites: Biol. 114 and 124 or approval of instructor.
- 430. Coastal Plant Ecology. (3-3). Credit 4.** Study of the identification, distribution, production, and ecological importance of estuarine, coastal marsh, and dune vascular plants; the interaction of plants with their abiotic and biotic environments; and techniques of vegetation management and evaluation. Prerequisites: Biol. 113 and 114 or approval of instructor.
- 435. Invertebrate Zoology. (3-3). Credit 4.** General biology of marine invertebrate animals; morphology, evolution and systematics. Laboratory will stress the studies of local fauna. Prerequisites: Biol. 114 and 124 and junior classification in Marine Biology, or approval of instructor.
- 440. Marine Biology. (3-3). Credit 4.** Introduction to biology of common organisms inhabiting bays, beaches and near-shore oceanic waters, with special reference to Gulf of Mexico biota. Lectures, laboratory studies and field trips will emphasize classification and economic aspects of marine organisms. A survey course, not intended for use in the Marine Biology curricula. Prerequisites: Biol. 113, 114, 123, 124 or equivalent; approval of instructor.
- 445. Principles of Fisheries Management. (2-2). Credit 3.** Basic knowledge from ichthyology, biology of fishes and limnology related to applied aspects of freshwater and marine fishery science. Management techniques applicable to streams, ponds, reservoirs, estuaries, and the oceans. Cross-listed with W.F.S. 410.
- 450. Developmental Biology of Marine Organisms. (3-3). Credit 4.** Principles of developmental biology and descriptive and analytical embryology of selected marine invertebrates and fishes. Prerequisite: MARB 435 or Biol. 435.
- 481. Seminar in Marine Biology. (1-0). Credit 1.** Problem oriented discussion session with topics and reports selected for current relevance in marine biology. May be repeated once only for credit. Prerequisite: Approval of department head.
- 485. Problems in Marine Biology. Credit 1 to 6 per semester.** Special topics and problems suited to analysis by individuals or small groups concerning aspects of marine biology. Prerequisite: Approval of department head.
- 489. Special Topics in . . . Credit 1 to 4.** Selected topics in identified areas of marine biology. Prerequisite: Approval of instructor.

MARINE ENGINEERING (MARE)

- 101. Engineering Analysis. (1-1). Credit 1.** Introduction to FORTRAN, fundamental programming and program structure and data representation. Introduction to computer solutions of numerical problems.
- 105. Engineering Mechanics I. (3-0). Credit 3.** Statics, basic vector operations, mechanics of particles and rigid bodies. Center of gravity, analysis of structures, friction, moments of inertia. Prerequisite: Math 151.
- 180. Basic Machine Shop Techniques. (0-3). Credit 1.** Safety, care of machines and hand-tools, cutting speeds and feeds, measuring instruments, gaging, standard machine tool work in metals, layouts, drilling, tapping, threading, vertical and horizontal milling and salving.
- 200. Basic Operations. Credit 4.** Practical application of student's classroom studies while at sea in training ship during sea-training period. Student required to complete several projects relating to engineering plant of ship. Prerequisite: NAUT 103.
- 202. Introduction to Marine Engineering Operations. Credit 4.** Introduction to the various aspects of shipboard marine engineering operations during the summer training cruise for students not intending to obtain Coast Guard License. Prerequisite: NAUT 103.
- 203. Diesel Engine Technology. (2-2). Credit 3.** Basic principles of two and four-stroke diesel engines; intake, scavenging and exhaust systems; injection systems; starting and reversing methods; cooling and lubricating systems; engine room layout in modern motor vessels.
- 206. Engineering Mechanics II. (3-0). Credit 3.** Dynamics; scalar and vector solutions of relative linear velocities and acceleration; kinetics; dynamics of translation and rotation; work; energy; impact; momentum. Prerequisite: MARE 105.
- 207. Electricity and Magnetism. (3-2). Credit 4.** Introduction to basic electricity, electric and magnetic circuits studied under DC and AC steady-state condition. Complex numbers, phasor algebra, complex impedance and three-phase circuits introduced. Laboratory includes measurement of circuit phenomena. Prerequisite: Math. 253; Phys. 219 or concurrent registration.
- 209. Mechanics of Materials. (3-0). Credit 3.** Introduction to the study of stresses, strains, and deformation of a solid body which results when static forces are applied to a body. Transformation of stresses and strains, torsion, beam deflection and combined loadings are discussed. Prerequisite: MARE 105.
- 210. Marine Construction Materials. (3-2). Credit 4.** Introduction to materials science; study of the properties of materials as related to marine engineering design and applications. Laboratory includes experimental evaluation of structural properties and heat treatment techniques. Prerequisite: MARE 209.
- 280. Welding Techniques. (0-3). Credit 1.** To introduce students to the materials, equipment and techniques of welding and brazing and to develop skills required by the Marine Engineer for this work in the engine room of Commercial ships.
- 300. Intermediate Operations. Credit 4.** Training program for second sea training period. Sea projects required of each student under supervision of officer-instructors. Lifeboat and safety training.

- 301. Heat Transfer. (3-2). Credit 4.** Conduction, convection and radiation separately and in combination. Steady and unsteady states, mathematical treatments, graphical and numerical solutions, dimensional analysis. Introduction to laboratory techniques involving heat transfer experiments. Prerequisites: Math. 308; MARE 344 or C.E. 311 (concurrent registration).
- 303. Marine Thermodynamics I. (3-0). Credit 3.** Energy concepts. First and second law of thermodynamics. Carnot and Rankine principles and reversible heat cycles. Properties and processes of vapors, vapor-power cycles and vapor refrigeration cycles. Prerequisite: Math 152.
- 304. Marine Thermodynamics II. (3-0). Credit 3.** Properties and processes of perfect gases, gas compression cycles, gas power cycles, air refrigeration cycles and processes involving mixture of gases and vapors. Prerequisite: MARE 303.
- 305. Introduction to Marine Nuclear Engineering. (3-3). Credit 4.** Preparation for advanced work in nuclear propulsion in field of marine nuclear engineering. Basic nuclear physics, ship reactors, nuclear instrumentation and radiation health protection. Prerequisites: Phys. 219; Math. 152; MARE 303.
- 307. Electrical Circuits. (3-2). Credit 4.** Steady-state and transient response studied by classical methods and by behavior of the impedance function. Principles of electronics, elementary amplifiers, transistors and solid state electronics are introduced. Prerequisites: MARE 207; Math 308.
- 308. Electrical Machinery. (3-2). Credit 4.** Principal types of direct-current and alternating-current electrical machines, including their characteristics, application, and central device. Operation and testing of electrical machinery and transformers. Prerequisite: MARE 207.
- 310. Engineering Computation. (3-0). Credit 3.** Techniques of problems solving using digital computers; concepts and properties of algorithms; solution of computational problems using algorithms defined by FORTRAN. Flow diagrams and program preparation. Prerequisites: Math. 152; MARE 101.
- 344. Fluid Mechanics. (3-0). Credit 3.** Application of laws of statics, buoyancy, stability, energy and momentum to behavior of ideal and real fluids. Dimensional analysis and similitude and their application to flow through ducts and piping. Dynamic lift and related problems. Prerequisite: MARE 206
- 400. Advanced Operations. Credit 4.** Training program for third sea training period. At end of this period each student will have achieved knowledge and will have demonstrated the ability to take complete charge of a modern marine power plant while underway at sea.
- 401. Nuclear Propulsion I. (3-0). Credit 3.** Reactor mechanics; fluid hydraulics, reactor core design, reactor fuels and their properties, shielding, construction and operation of related auxiliary machinery.
- 403. Marine Engineering Measurements Laboratory I. (1-2). Credit 2.** Basic techniques and instrumentation for performing engineering measurements as applied to solid mechanics, fluid mechanics, thermodynamics, stress analysis and vibrations. Written engineering reports of the experimental investigations required. Prerequisites: MARE 209; MARE 303; C.E. 311.
- 407. Marine Electronics Technology. (3-2). Credit 4.** The theory of operations and characteristics of electron devices and circuits; marine applications. Prerequisites: MARE 307; Math. 308.

- 410. Marine Power Plants. (2-2). Credit 3.** Selection and application of systems for marine propulsion and auxiliary systems. Analysis of propulsion and auxiliary system requirements. Prerequisite: MARE 301, 304; M.E. 344.
- 411. Marine Machine Design. (3-0). Credit 3.** Analysis of the design and application of components in marine mechanical systems. Prerequisites: MARE 206, 209.
- 412. Ship Structures and Stability. (3-0). Credit 3.** Introduction to the naval architecture involved in ship design. Geometry of the ship, evaluation of stability, motions in waves and a study of ships' structures. Prerequisites: MARE 209; C.E. 311 or registration therein.
- 414. Ship Automation. (3-2). Credit 4.** Linear servomechanism theory including transformation mathematics (Laplace transformation), the transfer function feedback, stability analysis and graphical techniques. Introduction to laboratory techniques involving open and closed loop concepts, negative and positive feedback concepts, and position and velocity outputs. Prerequisite: MARE 307.
- 415. Marine Engineering Systems Design. (3-0). Credit 3.** Application of systems engineering techniques in the solution of marine engineering problems regarding reliability, economic and environmental considerations. Prerequisite: MARE 410 (concurrent registration).
- 416. Engineering Laboratory II. (0-4). Credit 1.** Analysis of fundamentals of machinery dynamics, heat transfer, fluid friction losses in piping systems, steam nozzles. Steam reciprocating and diesel engines. Prerequisite: Senior classification.
- 418. Fundamentals of Radiation Control. (3-0). Credit 3.** Radiation control from the standpoint of protection, use of instrumentation, dosimetry, contamination control, waste disposal, radiation accidents and governmental regulations; shipboard applications. Prerequisite: MARE 401.
- 419. Marine Engineering Design Projects. (2-6). Credit 4.** Introduction to the design process, defining a design problem, goal recognition, information sources, patents, alternative designs, engineering economics, cost analysis, feasibility studies, proposals, specifications, preliminary design, modeling, decision making, optimization techniques, engineering ethics, reliability. A marine related design project is required including oral and written reports. Prerequisites: Senior classification or approval of department head.
- 421. Advanced Engineering Computations. (3-0). Credit 3.** Techniques for engineering problem solving using existing computer software packages, such as ANSYS. Static stress analysis problems will be dealt with in detail. Structural dynamics, heat transfer and hydromechanics problems will also be addressed. Prerequisite: MARE 310.
- 459. Mechanical Vibrations. (3-0). Credit 3.** Basic theory of vibrating systems with single and multiple degrees of freedom and principles of transmission and isolation of vibrations. Prerequisite: MARE 206.
- 471. Ethics in Management and Engineering. (3-0). Credit 3.** Ethical considerations and value judgements related to management and engineering decisions. Topics will include ethics, environmental impact considerations, user health and safety responsibilities and obligations of managers and engineers to society, supervisory duties, and responsibilities. Course work will include case studies and lectures by visiting managers, engineers and lawyers. Prerequisite: Senior standing.

- 485. Problems. Credit 1 to 4 each semester.** Special problems in marine engineering not covered by any other course in the curriculum. Work may be in either theory or laboratory. Prerequisite: Approval of department head.
- 489. Special Topics. Credit 1-4.** Selected topics in identified areas of marine engineering. Prerequisite: Senior classification or approval of department head.

MARINE FISHERIES (MARF)

- 201. Fisheries Conservation and Management. (3-0). Credit 3.** Introduction to fisheries resources of the United States with special reference to the Gulf of Mexico. Review of historical and current fishery management education and research.
- 400. Fisheries Survey. (4-0). Credit 4.** Survey of aquatic habitats that provides the opportunity for application of principles of fish ecology, limnology and aquatic biology to the solution of current fisheries problems. Characterization of fish communities to develop management plans or to delineate factors influencing community interrelationships. Prerequisites: Junior classification and approval of instructor.
- 423. Mariculture. (3-0). Credit 3.** Study of factors determining the success of efforts to cultivate estuarine and marine species of economic importance for use as human food. Mariculture practices used world wide in the production of algae, mollusks, crustaceans and fishes will be discussed. Prerequisite: Junior classification or approval of instructor.
- 445. Marine Fisheries Management. (2-2). Credit 3.** Basic knowledge from marine ichthyology, biology of fishes and biological oceanography related to applied aspects of marine fisheries sciences. Emphasis placed on management techniques applicable to tidal-influenced inland water, estuaries and oceans. Prerequisite: MARF 201 or approval of instructor.
- 481. Seminar in Marine Fisheries. (1-0). Credit 1.** Problem oriented discussion session — topics and reports selected for current relevance in marine fisheries sciences. May be repeated once only for credit. Prerequisite: Approval of department head.
- 485. Problems in Marine Fisheries. Credit 1 to 6 per semester.** Special topics and problems suited to analysis by individuals or small groups concerning aspects of marine fisheries sciences. Prerequisite: Approval of department head.
- 489. Special Topics in . . . Credit 1 to 4.** Study of selected topics in identified area of marine fisheries sciences. Prerequisite: Approval of department head.

MARINE SCIENCES (MARS)

- 101. Introduction to Marine Sciences (1-0). Credit 1.** A non-technical introduction to the field of Marine Sciences, including biology, ocean activities, and marine industries. Course includes lectures, seminars, outside speakers, and industrial contacts.
- 310. Field Methods in Marine Science. (1-6). Credit 3.** Techniques of documenting collected materials, the methods of reconnaissance and the mapping of traverses in the major coastal environments. Sampling and recording techniques, interview procedures and the use of base maps and remotely sensed imagery will be introduced. Prerequisite: 15 hours of marine sciences or the equivalent.

- 320. Coastal Zone Environments. (3-0). Credit 3.** Genesis, description, classification and geographical distribution of the major coastal zone environments and the processes responsible for both construction and destruction. The interactions of man with both "natural" and "modified" environments will be surveyed.
- 330. Petroleum Geology. (3-0). Credit 3.** Origin, migration, and accumulation of petroleum. Reservoir rock, traps, accumulation and conditions, and subsurface methods. Prerequisite: Geol. 101 or equivalent; Approval of instructor.
- 340. Geochemistry. (3-0). Credit 3.** Chemical principles and processes that govern the behavior of geologic materials. Silica and carbonate low temperature equilibrium and kinetics. Prerequisites: Chem 101, 102; Geol. 101, or consent of instructor.
- 350. Basic Programming. (3-0). Credit 3.** Introduction to "Basic" as a programming language; algorithms, storage, conditional clauses, arrays matrices, functions, character strings, routines and subroutines. Prerequisite: Consent of instructor.
- 360. Biochemistry. (3-0). Credit 3.** General introductory biochemistry; structures of lipids, saccharides and nucleotides; amino acids and protein structure; relationship of protein structure to biochemical reactivity; kinetics (and inhibition) of enzyme-catalyzed reactions; membrane phospholipids and glycoproteins and the structure and function of membranes; catabolic reaction pathways of monosaccharides and fatty acids; oxidative phosphorylation. Prerequisites: Biol. 114, Chem. 228, or Chem. 227 and consent of instructor.
- 370. Chemistry of Marine Natural Products (3-0). Credit 3.** Introduction to organic compounds of known molecular structure that are derived from marine plants and animals; the techniques for isolating and identifying these compounds, and for studying their physiological and pharmacological activity. Prerequisite CHEM 228.
- 380. Introduction to Physical Chemistry. (3-0). Credit 3.** Classical thermodynamics with applications to gases, liquids, solutions and phase equilibria. Kinetics and transport properties of gases. Statistical mechanics, spectroscopy, instrumentation and quantum theory at the survey level. Prerequisites: Chemistry 101 and 102, Chem. 111 and 112, Math. 151 or 230.
- 405. Waterborne Transportation of Hazardous Chemicals. (3-0). Credit 3.** Basic concepts associated with the transportation of hazardous chemical in congested port areas, along the nation's inland waterways, and at sea. Special emphasis on the hazards of fire, health, air and water pollution and chemical reactivity. Promulgation of safe operating practices by industry, the USCG and IMCO.
- 410. Introduction to Physical Oceanography. (3-0). Credit 3.** Introduction to physical processes in the marine system. Measurement techniques and instrumentation, wave and current dynamics, thermal structures. Prerequisites: Math 152 or equivalent, Physics 219 or equivalent, or consent of instructor.
- 420. Introduction to Chemical Oceanography. (3-0). Credit 3.** Introduction to chemical processes in the marine environment. Composition of sea salt, chemical speciation of dissolved material in the ocean. Biogeochemistry of oxygen, major elements, nutrient elements and some trace metals in the surface and deep ocean. Formation, chemical composition and alterations of detrital material and marine sediments. Simple models which relate ocean chemistry to the circulation of identifiable masses of water. Radioisotopes and stable isotopes in chemical oceanography. Prerequisite: Chem. 102.

- 430. Introduction to Geological Oceanography. (3-0). Credit 3.** Introduction to geological processes in the marine system: Physiographic provinces, origin and evolution of basins, shelves, slopes, and beaches. Geological sampling and geophysical methods; coastal beach and estuarine processes. Prerequisites: Geol. 101 or consent of instructor.
- 435. Exploration Geophysics. (3-0). Credit 3.** Physio-mechanical properties of rocks and sediments. Seismic reflection and refraction principles applicable to offshore, coastal and onshore exploration. Determination of media velocity and stratigraphy from reflection and refraction studies in both marine and non-marine systems. Prerequisites: Physics 202, Geology 101 or 104, Math. 151 or approval of instructor.
- 450. Electrical and Physical Measurements. (2-3). Credit 3.** Study of basic instrumentation pertinent to Marine Sciences and Biology as well as simple circuit design and digital electronics. Laboratory emphasizes spectroscopy, environmental measurements, and basic oceanographic measurements. Prerequisites: Chem 102, Phys 202, Math 230 or 151.
- 481. Seminar. (1-0). Credit 1.** Problem oriented discussion session. Topics and reports selected for current relevance. May be repeated once only for credit. Prerequisite: Approval of department head.
- 485. Problems. Credit 1 to 6 each semester.** Special topics and problems suited to analysis by individuals or small groups concerning special aspects of marine sciences. Prerequisite: Approval of department head.
- 489. Special Topics in... Credit 1 to 4.** Selected topics in an identified area of marine sciences. Prerequisite: Approval of instructor.

MARINE TRANSPORTATION (MART)

- 301. Ocean Transportation I. (4-0). Credit 4.** Shipping in world economy. Production of service; shipping process, equipment, labor, conferences, rate-making, role of government. Buying of service by shipper, finance of shipping, international conventions and treaties.
- 302. Marine Cargo Operations I. (3-3). Credit 4.** Objectives and problems with break-bulk cargo handling during loading, discharging and in-transit carriage. Requirements of special refrigerated and dangerous cargos. Heavy lift operations with conventional cargo gear and its restraints. Cargo loss prevention, safety and related documentation, as well as log book entries, Modern cargo concepts — containerization, roll-on roll-off, LASH and others. Maximum cargo efficiency with relation to space, cargo gear, crew and labor costs. Practical cargo gear use and cargo observations during lab periods.
- 304. Ocean Transportation II. (3-0). Credit 3.** Marine insurance problems and cases and how they relate directly to a ship's officer. Hull, cargo and personal injury cases are examined from the officer's and insurers' points of view. Introduction to Admiralty Law and the court process for seamen's rights and ship owner's privileges. Actual hearings and trials are observed to complete the background. Prerequisite: MART 301 or approval of department head.

- 321. Maritime Law I. (3-0). Credit 3.** Basic laws governing vessel navigation; International and U.S. Inland Rules for the prevention of collision at sea, and the safety of life at sea convention. Prerequisite: NAUT 200.
- 402. Ocean Transportation III. (4-0). Credit 4.** Essential principles of Admiralty and Maritime Law, advanced principles of marine insurance. Standard forms and Institute Clauses. Nuclear maritime insurance activities. Principles of International Law. Prerequisite: MART 304.
- 406. Marine Cargo Operations II. (2-2). Credit 3.** Principles and practice of bulk liquid and gas handling and carriage by water craft. Theoretical and practical problems involved in loading, stowing and discharging of petroleum, chemical, elevated temperature and cryogenic cargoes. Marine pollution abatement, personnel safety and fire-fighting techniques and systems.
- 416. Port Operations, Administration and Economics. (3-0). Credit 3.** Concept of the port and methods of intermodal transfer. Port functions divided and analyzed along business lines — economics, management, finance, accounting and marketing. Cost studies. Prerequisite: Econ. 321; Mgmt. 105; or approval of department head.
- 421. Maritime Law II. (3-0). Credit 3.** Essential principles of admiralty, general maritime and international law as applicable to the marine industry and ocean shipping. Evolution and state of the law concerning maritime liens, ship mortgages, rights of seamen and harbor workers, limitation of liability, bills of lading and cargo carriage, collision liability, general average, marine salvage, charter parties and international rights and responsibilities of ships and shipping.
- 481. Seminar. (0-2). Credit 1.** Problem oriented discussion session. Topics and reports selected for relevance to current problems. Prerequisite: Approval of department head.
- 485. Problems. Credit 1 to 4 each semester.** Directed study in problems in marine transportation not covered by other courses in the department. Prerequisite: Senior classification or approval of department head.
- 489. Special Topics in Marine Transportation. Credit 1 to 3.** Selected topics in an identified area of marine transportation and nautical science. Prerequisite: Approval of instructor.

MARITIME ADMINISTRATION (MARA)

- 212. Business Law. (3-0). Credit 3.** Legal principles affecting managerial decisions including: contract law, agency, law of business entities, inclusive of partnership, limited partnership and corporation; creditors' rights, debtor protection; and the Uniform Commercial Code, with particular emphasis on negotiable instruments and sales. Prerequisite: Sophomore classification.
- 301. Business Computing. (3-0). Credit 3.** An introduction to the use of computers as data processing and problem solving tools. A first course covering fundamental concepts. Technology and theory with the opportunity to create new programs and utilize existing programs to solve business related problems.

- 363. The Organizing Process. (3-0). Credit 3.** Management as an academic discipline is defined and its evolution sketched. Goal setting; planning, controlling and decision-making; models for thinking about organizations; organization design; organization change; models for understanding individual behavior; job performance and job satisfaction; interpersonal behavior, motivation and leadership, behavior in work groups; and careers in management. Prerequisite: Junior classification. Cross-listed with Mgmt. 363.
- 401. Brokerage and Chartering. (3-0). Credit 3.** Operational and legal environment of ship brokerage and chartering; responsibilities of owner and charterer under various charter forms; American, British and Canadian acts governing charters and bills of lading; rules and regulations concerning loading and discharging. Prerequisite: Senior classification or approval of department head.
- 402. Inland Waterways. (3-0). Credit 3.** Development of inland waterways of the U.S. and federal policies relating to them. Port and terminal development, competition with other transportation forms, manpower, rates, environmental concerns and the impact of waterway systems on regional economies. Prerequisite: Senior classification or approval of department head.
- 422. Personnel Management. (3-0). Credit 3.** Relationship of the personnel function to the whole organization; manpower planning; recruitment; selection including employment application, interviewing, testing, reference checks, probationary period; placement; separation; compensation; training; performance appraisal; labor relations; and safety. Prerequisite: MARA 363 or approval of instructor. Cross-listed with Mgmt. 422.
- 435. Labor Law and Policy. (3-0). Credit 3.** Federal and state public policy and law regulating collective bargaining and issues in employment discrimination law. Legal environment of labor relations; conspiracy doctrine applied to labor union; labor injunctions; Norris-LaGuardia Act; Wagner Act; Taft-Hartley Act; National Labor Relations Board; control of bargaining unit; strikes, lockouts and picketing; secondary boycotts; National Emergency Labor Disputes; Landrum Griffin Act; legal bases of public section unionism; race, sex and religious discrimination in employment. Prerequisite: Senior classification or approval of instructor. Cross listed with Mgmt. 435.
- 460. Management Systems and Control. (3-0). Credit 3.** Applications of management planning and control techniques to complex organizational problems and management decision-making tasks; socio-technical work systems and human-machine systems; basic systems theory and concepts; basic control theory concepts; systems design process; systems analysis techniques such as simulation models and sensitivity analysis; information technology and management information systems; program and project management; and special-purpose planning and control systems. Prerequisite: MARA 363 or approval of instructor. Cross-listed with Mgmt. 460.
- 466. Management Policy. (3-0). Credit 3.** Policy problems of business organizations; top management problem-solving and decision-making; planning; appraising the business environment; the firm's financial, human and physical resources; forecasting, developing objectives and strategies; evaluating alternatives; implementing strategies; measuring results; profitability and social responsibility. Use of case analysis. Prerequisites: MARA 363 and senior classification. Cross-listed with Mgmt. 466.

- 481. Seminar in Maritime Administration. (1-0). Credit 1. I, II.** Discussion and observation of current management practice in the maritime public and private maritime sectors of the nation. Reading and discussion of current events and changes taking place in management theory and/or its application and practice in actual business and government situations. Prerequisite: Approval of department head.
- 484. Management Internship. (3-0). Credit 3.** Internship in managing; short and long-term planning; organizing; leading and controlling. Enrollment is limited to those who have managerial responsibilities for the resources used by a campus organization, business firm, or the like. Prerequisite: Approval of department head.
- 485. Problems. Credit 1 to 3 each semester.** Directed by study on selected Problems in the area of Maritime Administration not covered in other courses. Prerequisite: Approval of department head.
- 489. Special Topics in . . . Credit 1 to 4.** Study of selected area in Maritime Administration. Consult the professor offering a particular special topics course for details. May be repeated for credit. Prerequisite: Approval of department head.

MARITIME SYSTEMS ENGINEERING (MASE)

- 100. Introduction to Maritime Systems Engineering. (2-3). Credit 3.** Activities and career opportunities in the ocean and maritime industries; lectures, seminars and field trips; outside speakers and industry contact. Desalination, ocean mining, fish farming, pollution, pipelines, submersibles and habitats, fixed and floating platforms, high-speed marine transportation.
- 375. Science of Fluids. (3-0). Credit 3.** Classical fluid mechanics; fundamental physical principles. Fluid statics, principles of fluid motion, frictionless flow, surface waves, viscous flows, turbulence, molecular basis of fluid mechanics. Prerequisite: Math. 253.
- 411. Advanced Hydrodynamics I. (3-0). Credit 3.** Hydrodynamics of ship design, semisubmersible platforms, underwater pipelines, hydrofoils, etc. Studies are made of principle types of flow, flow of ideal and real liquids around flat and curved surfaces, separation, eddying, and cavitation. Additional studies are made of flow around discontinuities in a surface, wave making, flow of a liquid around a hydrofoil, production of thrust in a liquid and interaction of hull, appendages and propulsion devices. Prerequisite: O.E. 462.
- 412. Advanced Hydrodynamics II. (3-0). Credit 3.** This is a continuation of MASE 411. A presentation of additional techniques and current data available for the practical applications of hydrodynamics to industry design problems. Subject matter includes potential flow patterns and velocity and pressure diagrams around various bodies, source-sink flow diagrams, data on separation, eddying, and vortex motion, inception and effect of cavitation on propellers, data on ship waves and calculation of appendage resistance. Prerequisite: MASE 411.
- 415. Marine Structures Design. (3-0). Credit 3.** Forcing function of surface waves and currents. Dynamics of marine structure, deterministic and probabilistic approaches to fixed structure design, design project-dynamic analysis of a fixed offshore structure from a given design wave. Prerequisite: O.E. 300.

- 461. Electronic Instrumentation. (2-3). Credit 3.** For non-electrical engineering majors. Applications of electronic instruments to research problems in field of measurements and control systems. Prerequisites: Math. 308; Phys. 219.
- 485. Problems in Maritime Systems Engineering. Credit 1 to 4 per semester.** Directed study on selected current problems in the ocean and/or maritime industry. Offered to enable individuals or groups to undertake and complete with credit some specialized investigation not covered by other courses. Prerequisite: Approval of department head.
- 489. Special Topics in . . . Credit 1 to 4.** Selected topics in identified areas of maritime systems engineering. Prerequisite: Approval of instructor.

MARKETING (Mktg.)

- 321. Marketing. (3-0). Credit 3.** Institutions, processes and problems involved in transferring goods from producers to consumers on economic and social aspects. Prerequisite: Econ. 204 or approval of instructor.
- 485. Problems. Credit 1 to 3 each semester.** Directed study on selected problems in the area of marketing not covered in other courses. Prerequisites: Senior classification; approval of department head; Mktg. 321; 2.0 GPR in major and university course work.

MATHEMATICS (Math.)

- 104. Analytic Geometry. (3-0). Credit 3.** Rectangular coordinates; equations and set of points; lines, circles and other conic sections; polar coordinates; solid analytic geometry; introduction to vectors and matrices.
- 106. Plane and Spherical Trigonometry. (4-0). Credit 4.** Definitions of trigonometric functions; evaluation of functions of special angles, fundamental relations; solution of triangles; trigonometric reductions; angular measure; functions of composite angle; logarithms, inverse trigonometric functions; trigonometric equations; basic ideas and formulas of spherical trigonometry; solution of spherical triangles, application to terrestrial and astronomical triangles.
- 130. Mathematical Concepts — Pre-Calculus. (3-0). Credit 3.** Functions and their graphs. Analytic geometry; linear and quadratic functions, polynomial functions. Trigonometric functions. Exponents.
- 150. Functions, Trigonometry and Linear Systems. (4-0). Credit 4.** Graphs, functions, college algebra, and trigonometry, linear systems, and vectors.
- 151. Engineering Mathematics I. (3-2). Credit 4.** Rectangular coordinates, analytical geometry, vectors and matrices, functions, limits, derivatives of functions, applications, integration, areas and volumes by integration. Prerequisites: High school algebra, trigonometry and geometry or satisfactory performance on a qualifying exam.

- 152. Engineering Mathematics II. (3-2). Credit 4.** Differentiation and integration techniques and their applications, improper integrals, approximate integration, mean value theorems, analytical geometry. Prerequisite: Math. 151.
- 230. Mathematical Concepts — Calculus. (3-0). Credit 3.** Limits and continuity. Rates of change, slope. Differentiation: the derivative, maxima and minima, techniques. Integration: the definite and indefinite integral techniques. Curve fitting. Prerequisite: Math. 130 or equivalent.
- 253. Engineering Mathematics III. (3-2). Credit 4.** Elementary vector algebra, infinite series, power series, Taylor series, and indeterminate forms. Calculus of functions of several variables, spatial derivatives, directional derivatives, gradient, multiple integration applications. Prerequisite: Math. 152.
- 304. Linear Algebra. (3-0). Credit 3.** Introductory course in linear algebra covering abstract ideas of vector space and linear transformation as well as models and applications of these concepts, i.e. systems of linear equations, matrices and determinants.
- 308. Differential Equations. (3-0). Credit 3.** Linear equations, solutions in series, solutions using Laplace transforms, systems of differential equations, partial differential equations and boundary value problems. Fourier series. Prerequisite: Math. 253 or equivalent.
- 311. Topics in Applied Mathematics I. (3-0). Credit 3.** Matrices, determinants, systems of linear equations, eigenvalues, eigenvectors, diagonalization of symmetric matrices. Vector analysis; normal derivative, gradient, divergence, curl, line and surface integrals, Gauss', Green's and Stokes' theorems. Prerequisite: Math. 221 or 253 or equivalent.
- 312. Topics in Applied Mathematics II. (3-0). Credit 3.** Fourier series, Gibbs' phenomenon, Fourier integral and transform, orthogonal functions. Partial differential equations and boundary value problems; Sturm-Liouville systems and applications to vibrating systems, heat flow and potential theory. Prerequisite: Math. 308 or equivalent.
- 485. Problems. Credit 1 or more.** Special problems in mathematics not covered by any other course in the curriculum. Work may be in either theory or laboratory. Prerequisite: Approval of department head.
- 489. Special Topics in. . . Credit 1 to 4.** Study of selected topics in an identified area of mathematics. May be repeated for credit. Prerequisite: Approval of instructor.

MECHANICS AND MATERIALS (M.M.)

- 460. Introduction to Continuum Mechanics. (3-0). Credit 3.** Tensor formulation of the underlying physical and mathematical principles pertinent to continuous mass media. Solid mechanics and fluid mechanics and their interrelationships. Consideration is limited to Cartesian tensors. Prerequisite: Senior classification.

- 467. Matrix Analysis of Structures I. (3-0). Credit 3.** Theory of matrix algebra and solution of linear algebraic equations; basic energy principles and virtual work; finite element static analysis of frame structures using the direct stiffness method. Computer applications. Prerequisites: Knowledge of FORTRAN programming; Aero. 304, C.E. 345 or M.E. 338.

METEOROLOGY (Met.)

- 301. Atmospheric Science. (3-0). Credit 3.** Structure, energy, and motions of the atmosphere; climate; fronts and cyclones; atmospheric stability; clouds and precipitation; severe storms. Met. 301 and 600 may not both be taken for credit. Prerequisite: Approval of instructor.
- 302. Weather Reports and Forecasting. (3-0). Credit 3.** Global weather reporting, codes and data transmission, radio-facsimile weather maps. Features of circulation, synoptic weather analysis avoiding storms at sea.

NAUTICAL SCIENCE (NAUT)

- 103. Maritime Orientation & Lifesaving. (2-3). Credit 3.** Introduction to the maritime industry, the ships, the seaman and the purpose of the U.S. Merchant Marine. Shipboard nomenclature, cargoes and recent trends in the marine industry. Practical lifeboat and lifesaving training for certification as Lifeboatman by the U.S. Coast Guard.
- 200. Basic Communications, Navigation, and Seamanship. Credit 4.** Practical application of student's classroom studies aboard training ship during first training cruise. Student completes basic projects in communications, navigation, seamanship and rules of the road. Prerequisites: NAUT 103, 203, 204 or permission of department head.
- 201. Naval Architecture I. (3-2). Credit 4.** Description of ship as self-sustaining unit. Shipbuilding nomenclature and dimensions, types of construction and classification of merchant ships. Classification societies, shipbuilding materials and methods and structural components of ship.
- 202. Naval Architecture II. (3-0). Credit 3.** Ship's lines drawing and form calculations; principles of flotation and buoyancy; inclining experiments, free liquids, transverse stability; motion of ships in waves, seaway and dynamic loads, ship structure tests.
- 203. Seamanship I. (2-3). Credit 3.** Intermediate lifeboat, lifesaving and firefighting procedures. Practical use in lab of manila lines, wire, splicing, knots, block and tackle, cargo gear, anchoring, mooring and steering gear operations. Introduction to the International Rules of the Road. Projects aboard merchant, research, and offshore oil vessels in the ports of Galveston and Texas City.
- 204. Terrestrial Navigation. (2-2). Credit 3.** Fundamentals of piloting, chart construction and development, aids to navigation, useful publications, principles of magnetism and the magnetic compass, great circle, Mercator and middle latitude sailing.

- 300. Intermediate Communications, Navigation, and Seamanship. Credit 4.** Practical application of student's classroom studies aboard training ship during second training cruise. Student completes intermediate projects in communications, navigation, seamanship and rules of the road. Thorough study made of U.S. Public Health requirements in first aid. Prerequisites: NAUT 200, 203, 303, or permission of department head.
- 301. Seamanship II. (2-3). Credit 3.** Mechanical appliances aboard ship, accident prevention, vessel sanitation, Marine Inspection laws and regulations, Search and Rescue Procedures, communications.
- 302. Seamanship III. (1-3). Credit 2.** Principles and methods of propulsion and steering of ships. Ship handling in narrow channels and heavy seas, docking, undocking, mooring and towing.
- 303. Celestial Navigation. (2-3). Credit 3.** Full range of celestial navigation. Survey of nautical astronomy, sight reduction, sextants, compass error determination and solutions of the navigational triangle by various methods.
- 304. Electronic Navigation. (2-2). Credit 3.** Theory, operation and application of marine electronic navigation aids and systems; marine gyro compass, radio direction finder, Loran, Omega, Decca, satellite, echo sounder, Doppler and integrated navigation systems. Marine radar theory, operation and interpretation. Student examined for U.S. Coast Guard Certification as "Radar Observer" following completion of course.
- 400. Advanced Communications, Navigation, and Seamanship. Credit 4.** Practical application of student's classroom studies aboard training ship during third training cruise. Student completes advanced projects in communications, navigation, seamanship and Rules of the Road. Prerequisites: NAUT 200, 203, 300 or equivalent, MART 321, or permission of department head.
- 401. Seamanship IV. (2-3). Credit 3.** Principles and methods of propulsion and steering of ships. Ship handling in narrow channels and heavy seas, docking, undocking, anchoring, mooring and towing are stressed. Also covered is the new equipment introduced into the industry in recent years.
- 404. The Navigator. (2-3). Credit 3.** Intensive, in-depth review of the principles of electronic, celestial and terrestrial navigation in preparation for the U.S. Coast Guard examination for Third Mate.

NAVAL SCIENCE (N.S.)

- 200. Naval Science For the Merchant Marine Officer I. (3-0). Credit 3.** Organization of the U.S. Navy (including the Naval Control of Shipping Organization) with discussion of the Merchant Marine Naval Reserve commission in order to provide a sound basis for liaison between the U.S. Navy and the Merchant Marine. Seapower will be analyzed and Naval communications procedures and underway replenishment procedures will be introduced.
- 300. Naval Science For the Merchant Marine Officer II. (3-0). Credit 3.** The nature of the hostile naval threat and types of surface, subsurface, and air attacks to which both U.S. Naval and merchant shipping can be subjected are presented. Self-defense measures which merchant ships can employ and Naval escort defensive actions will be analyzed. The student will become proficient in maneuvering when in convoy and familiar with naval damage control procedures.

- 485. Problems. Credit 1 to 4.** Directed study in problems in the field of naval science not covered by other courses in the department. Prerequisites: Senior classification and approval of department head.

OCEAN ENGINEERING (O.E.)

- 300. Dynamics of Waves and Structures I. (3-0). Credit 3.** Physical and mathematical fundamentals of ocean wave behavior. Mechanics of wave motion. Use of statistics and probability to develop design wave criteria. Prerequisites: C.E. 311, M.E. 213 or equivalent.
- 301. Dynamics of Waves and Structures II. (3-0). Credit 3.** Prediction of loads due to wind, current, and waves; introduction to concepts of linear structural dynamics and to the design of ocean structures; mooring and towing analysis; fluid-structure interactions; vibration of submerged structures. Prerequisite: O.E. 300.
- 400. Basic Coastal Engineering. (3-0). Credit 3.** Mechanics of wave motion. Wave refraction, diffraction, and reflection. Wave forecasting. Shore processes. Planning of coastal engineering projects. Design of seawalls, breakwaters, and fixed offshore installations. Offshore pipelines. Dredging. Control of oil spills in estuaries and at sea. Prerequisite: C.E. 311 or equivalent.
- 401. Measurements in the Ocean. (3-0). Credit 3.** Fundamentals of measurement systems. Design of measurement systems, or instrumentation, used to evaluate oceanographic parameters of scientific and engineering interest. Fundamentals of underwater acoustics and the use of these fundamentals in ocean measurement systems. Introduction to laboratory and field techniques for measuring engineering parameters in the ocean environment. Prerequisites: O.E. 300 or registration therein.
- 403. Estuary Engineering. (3-0). Credit 3.** Classification of estuaries. Introduction to tides and application of tidal hydraulics to real estuaries. Fundamentals of salinity, intrusion, turbulent diffusion and mixing, and sedimentation processes as applied to the estuarine environment. Mathematical and hydraulic modeling of estuaries. Dredging and pollution problems. Prerequisite: O.E. 300 or approval of instructor.
- 410. Measurements in the Ocean Laboratory. (0-3). Credit 1.** Laboratory and field techniques for measuring engineering parameters in the ocean environment. Prerequisite: O.E. 300, 401, or registration therein.
- 462. Hydromechanics. (3-0). Credit 3.** Kinematics of fluids. Dynamics of frictionless incompressible flow. Irrotational flow. Streamlines and stream function. Vorticity. Flow of viscous fluid; Cartesian tensors, Navier-Stokes equation and its solution, flow with low Reynolds number. Two-dimensional laminar boundary layers. Turbulent flow. Prerequisites: Aero. 301 or C.E. 311 or M.E. 344, and Math. 308.
- 485. Problems. Credit 1 or more.** Special reading assignments, problems and discussion on oceanographic topics of mutual interest to student and instructor. Prerequisite: OCN 401 or approval of instructor.

OCEANOGRAPHY (Ocn.)

- 401. Introduction to Oceanography. (3-0). Credit 3.** Subject matter survey. Interdisciplinary relationship between biological, chemical, geological, and physical aspects of field. Prerequisites: Approval of instructor; junior or senior classification; Math. 104 and Chem. 102, 104 or 114; approval of instructor.

PHYSICS (Phys.)

- 201. College Physics. (3-3). Credit 4.** Fundamentals of classical mechanics, heat and sound. Prerequisite: Math. 103.
- 202. College Physics. (3-3). Credit 4.** Continuation of Phys. 201. Fundamentals of classical electricity and light and introduction to contemporary physics. Prerequisite: Phys. 201.
- 218. Mechanics. (3-3). Credit 4.** Mechanics for students of the physical sciences. Prerequisite: Math. 151 or registration therein.
- 219. Electricity. (3-3). Credit 4.** Electricity, magnetism and light. Prerequisites: Math. 122 or 152; Phys. 218 or equivalent.
- 485. Problems. Credit 1 or more.** Special work in laboratory or theory to meet individual requirements in cases not covered by regular curriculum. Prerequisite: Approval of department head.

POLITICAL SCIENCE (Pol.S.)

- 206. American National Government. (3-0). Credit 3.** Survey of American national government, politics and constitutional development.
- 207. State and Local Government. (3-0). Credit 3.** Survey of state and local government and politics with special reference to the constitution and politics of Texas.
- 340. Introduction to Public Administration. (3-0). Credit 3.** American public administration; development of public service; theories of organization and management, executive leadership, policy formation, personnel practices and public relations. Prerequisite: Pol. S. 206 or approval of department head.
- 485. Problems. Credit 1 to 6 each semester.** Individual instruction in selected aspects of political science not adequately covered by other courses. Prerequisite: Approval of department head.
- 489. Special Topics in . . . Credit 1 to 4.** Study of selected topics in an identified area of political science and public policy. May be repeated for credit. Prerequisite: Pol.S. 206 or approval of department head.

PSYCHOLOGY (Psy.)

- 107. Introduction to Psychology. (3-0). Credit 3.** Introductory course dealing with elementary principles of human behavior.

STATISTICS (Stat.)

- 302. Statistical Methods. (2-2). Credit 3.** Intended for undergraduate students in the biological sciences and agriculture (except agricultural economics). Nonmathematical introduction to concepts of random sampling and statistical inference; estimation and testing hypotheses of means and variances; analyses of variance; regression analysis; chi-square tests. Prerequisite: Math. 102 or equivalent.
- 485. Problems. Credit 1 to 6.** Special problems in statistics not covered by another course in the curriculum. Work may be in either theory or methodology. Prerequisite: Approval of instructor.
- 489. Special Topics in . . . Credit 1 to 4.** Study of selected topics in an identified area of statistics. Topics may be of interest to applied mathematics majors as well as majors in other disciplines. May be repeated for credit. Prerequisite: Approval of instructor.

WILDLIFE AND FISHERIES SCIENCES (W.F.S.)

- 311. Ichthyology. (2-3). Credit 3.** Designed to familiarize student with fresh-water and marine fishes. Subject will be mainly systematic, but evolution, ecology, life history and economics of more important species will be treated. Prerequisite: Biol. 318 or W.F.S. 302.
- 400. Fisheries Survey. Credit 4.** Survey of aquatic habitats that provides the opportunity for application of principles of fish ecology, limnology and aquatic biology to the solution of current fisheries problems. Characterization of fish communities to develop management plans or to delineate factors influencing community interrelationships. Prerequisites: Junior classification and approval of instructor.
- 410. Principles of Fisheries Management. (2-2). Credit 3.** Basic knowledge from ichthyology, biology of fishes and limnology related to applied aspects of freshwater and marine fishery science. Management techniques applicable to streams, ponds, reservoirs, estuaries and the oceans.
- 418. Fisheries Population Dynamics. (2-2). Credit 3.** Recruitment, growth, natural mortality and exploitation of populations; their implications to management of commercial fisheries. Prerequisites: Stat. 210 or 302; Math. 230; or approval of instructor.
- 485. Wildlife Problems. Credit 1 to 3.** Individual study and research on selected problem approved by instructor and academic advisor. Prerequisites: Junior or senior classification; approval of department head.



**THE FACULTY
OF
TEXAS A&M UNIVERSITY
AT GALVESTON**

(Correct as of September 15, 1984)

- ALDRICH, David V.**, Professor of Marine Biology (1966, 1978).*
B.A., Kenyon College, 1950; M.A., Rice University, 1952; Ph.D., Rice University, 1954.
- ALEXANDER, Harold C.**, P.E., Assistant Professor of Marine Engineering (1981).
B.S., Nova Scotia Technical College, 1973; M.S., Nova Scotia Technical College, 1975; Ph.D., Texas A&M University, 1979.
- ALEXANDER, Steve K.**, Assistant Professor of Marine Biology (1982).
B.S., University of Houston, 1972; M.S., Louisiana State University, 1973; Ph.D., Louisiana State University, 1976.
- AQUINO, Dolores C.**, Laboratory Instructor in Marine Sciences (Chemistry) (1984).
B.S., Illinois Institute of Technology, 1970; Ph.D., Ohio State University, 1977.
- BLOZINSKI, Anthony P.**, Associate Professor of General Academics (Mathematics) (1976, 1980).
B.S., University of Seattle, 1966; M.S., Purdue University, 1968; Ph.D., Purdue University, 1970.
- BRAY, Elliot O.**, Lecturer in Marine Sciences and Director of the Computer Center (1980).
B.S., Lamar University, 1962; M.S., Texas A&M University, 1967.
- CARMICHAEL, Jerry K.**, MML, USN, Instructor in Naval Science (1984).
MM "A" School 1975, Air conditioning and Refrigeration School, 1978.
- CHANG, Tyne-Hsien**, Assistant Professor of Maritime Systems Engineering (1981).
B.S., National Chen-kung University, 1974; M.S., University of Florida, 1978; Ph.D., University of Florida, 1981.
- CLAYTON, William H.**, President and Professor of Oceanography and Meteorology (1954, 1971).
B.S. Bucknell University, 1949; Ph.D., Texas A&M University, 1956.
- CLYBURN, John W.**, Lecturer in General Academics (1973).
B.A., University of Texas, 1961; M.A., University of Houston, 1969.
- COLEMAN, Charles H., Jr.**, Laboratory Instructor in Marine Sciences (1977).
B.S., Texas A&M University, 1974.
- CONTI, Joseph O.**, Lecturer in Maritime Administration (1978).
B.S., University of Houston, 1974; M.Ed., University of Houston, 1975.

*(Figures in parentheses indicate date of first appointment on the University staff and date of appointment to present position, respectively.)

- CORKE, Henry E.**, Lecturer in General Academics (Mathematics-Physics) (1975).
B.S., University of Houston, 1961; M.S., University of Houston, 1963; Ph.D., University of Houston, 1970.
- CRAVEY, Melanie J.**, Assistant Professor of Marine Sciences (Chemistry) (1983).
B.S., Lamar University, 1972; Ph.D., University of Houston, 1977.
- CRISP, Edward L.**, Lecturer in Marine Sciences (Geology) (1977).
B.S., Morehead State University, 1969; M.S., University of Kentucky, 1973; Ph.D., Indiana University, 1975.
- CURLEY, Stephen J.**, Associate Professor of General Academics (English) (1973, 1980).
B.A., Fordham University, 1968; Ph.D., Rice University, 1974.
- DAVIS, Ralph G., P.E.**, Associate Professor of Marine Engineering and Associate Dean of Texas Maritime College, (1980, 1984).
B.S., U.S. Naval Academy, 1954; M.S., Massachusetts Institute of Technology, 1960; M.S.A., George Washington University, 1970.
- DAWSON, Joseph G. III**, Assistant Professor of General Academics (History) (1979) and Head of the Department (1979, 1983).
B.A., Louisiana State University, 1967; M.A., Louisiana State University, 1970; Ph.D., Louisiana State University, 1978.
- ESHER, Mark R.**, Assistant Professor of Marine Transportation (1984).
B.S., U.S. Merchant Marine Academy, 1975; M.B.A., University of Kansas, 1980.
- ESTES, Ernest L. III**, Associate Professor of Marine Sciences (Geology) (1976, 1981).
B.S., Lawrence University, 1965; M.S., Duke University, 1967; Ph.D., University of North Carolina, 1971.
- EWING, Robert H.**, Lecturer in Maritime Administration (1983).
B.S., U.S. Naval Academy, 1944; M.S.B.A., George Washington University, 1966.
- FASANO, Richard D.**, Lecturer in Marine Transportation (1980).
B.S., U.S. Merchant Marine Academy, 1963.
- FOLDEN, Charles A.**, Laboratory Instructor in Marine Sciences (Chemistry) (1979).
B.S., California State University, Long Beach, 1975; M.A., Governors State University, 1979.
- GARCIA, Salvador R.**, Assistant Professor of Maritime Systems Engineering (1974, 1979).
B.A., University of Texas at Austin, 1969; M.Ed., Texas A&M University, 1974; M.S., University of Houston at Clear Lake City, 1982.
- GARDNER, Mary**, Lecturer in General Academics (English) (1984).
B.S. University of Wisconsin, 1959; M.A., University of Chicago, 1961.
- GRIFFIN, Lawrence L.**, Associate Professor of Marine Sciences (Chemistry) (1976).
B.A., University of Texas at Austin, 1962; M.S., University of Texas at Austin, 1965; Ph.D., University of Texas at Austin, 1972.

- HARPER, Donald E. Jr.**, Associate Professor of Marine Biology (1975, 1980).
B.S., University of Miami, 1963; M.S., Texas A&M University, 1966; Ph.D., Texas A&M University, 1970.
- HATLEY, Jimmy D.**, Associate Professor of Maritime Systems Engineering (1968, 1975).
B.S., East Texas State University, 1959; M.Ed., Southwest Texas State University, 1962; D.Ed., Texas A&M University, 1969.
- HEWITT, William P.**, Lecturer in General Academics (History) (1984).
B.S., M.A., Memphis State University, 1964, 1966; Ph.D., University of Texas, 1978.
- HITE, Gerald E.**, Assistant Professor of Marine Sciences (Physics) (1980).
B.S., Case Western Reserve, 1962; M.S., University of Illinois, 1964; Ph.D., University of Illinois, 1967; Habilitation, Universität Kaiserslautern, 1974.
- JOHNSON, Thomas S.**, Associate Professor of General Academics (English) (1974, 1981).
B.A., Loyola University of Los Angeles, 1966; M.A., University of California at Los Angeles, 1968; Ph.D., University of Texas at Austin, 1973.
- KANZ, James E.**, Assistant Professor of Marine Biology (1978).
B.A., University of Washington, 1966; Ph.D., Tufts University, 1973.
- KATCHER, Steven A.**, LT, USN., Associate Professor of Naval Science and Head of the Department of Naval Science (1982).
B.S., U.S. Naval Academy, 1976.
- KENT, Samuel B.**, Lecturer in Marine Transportation (1980).
B.S., University of Texas, 1971; J.D., University of Texas at Austin School of Law, 1975.
- KLEIN, Douglas J.**, Associate Professor of Marine Sciences (Physical Chemistry) (1979).
B.S., Oregon State University, 1964; M.A., University of Texas, 1967; Ph.D., University of Texas, 1969.
- LANDRY, Andre M., Jr.**, Associate Professor of Marine Biology (1976, 1981).
B.S., Tulane University, 1968; M.S., Texas A&M University, 1971; Ph.D., Texas A&M University, 1977.
- LINN, Johnnie B. III**, Assistant Professor of Maritime Administration (1983).
B.S., Massachusetts Institute of Technology, 1969; M.S., Texas A&M University, 1975; J.D., University of Miami, 1978; Ph.D., Texas A&M University, 1984.
- LOEBLICH, Laurel A.**, Lecturer in Marine Biology (1980).
A.B., University of California, Los Angeles, 1966; Ph.D., University of California, San Diego, 1972.
- MAGEE, Eugene J.**, Lecturer in Marine Transportation (1982).
B.S., New York Maritime Academy State University of New York, 1976.

- McCLOY, James M.**, Associate Professor of Marine Sciences (Marine Geography) and Director, Coastal Zone Laboratory (1971, 1975).
B.A., California State College at Los Angeles, 1961; Ph.D., Louisiana State University, 1969.
- McCONACHIE, Michael P.**, Lecturer in General Academics (Political Science) (1984).
B.A., University of Texas, 1978; M.A., Ph.D., University of Missouri-Columbia, 1979, 1984.
- McCOY, Noel H.**, Lecturer in Maritime Administration (1984).
B.S., Southern Methodist University, 1956; Ph.D., University of Texas, 1971.
- MEADOWS, James S.**, Lecturer in General Academics (Mathematics) (1979).
B.S., East Texas State University, 1956; M.A., University of Illinois, 1967; M.Ed., East Texas State University, 1969.
- MEEK, Charles C.**, Lecturer in General Academics (English), (1982).
B.A., Texas Christian University, 1949; M.A., University of Houston, 1970.
- MOORE, John A.**, Lecturer in Marine Engineering (1965).
B.S., Rose Polytechnic Institute, 1934.
- MOORE, Sylvia M.**, Laboratory Instructor in Marine Sciences (Chemistry) (1975).
B.S., San Diego State University, 1955.
- NANCE, James M.**, Lecturer in Marine Biology (1984).
B.S., M.S., Brigham Young University, 1974, 1976; Ph.D., Texas A&M University, 1984.
- NEWELL, James A.**, Lecturer in General Academics (Statistics) (1981).
B.S., Stephen F. Austin University, 1963; M.S., North Texas State University, 1964; Ph.D., North Texas State University, 1971.
- NORK, Thomas R.**, Lecturer in Marine Transportation (1984).
B.S., Suny Maritime College, 1978.
- OLSEN, William A.**, LT, USN, Assistant Professor of Naval Science (1982).
A.A., Del Mar Junior College, 1976; B.S., University of Texas at Austin, 1978.
- PARK, Edward T.**, Associate Professor of Marine Biology (1969, 1973).
B.S., Pusan Fisheries College (Korea), 1952; M.S., University of Washington, 1957; Ph.D., University of Washington, 1965.
- PICKFORD, Lavon J.**, Lecturer in Maritime Administration and Coordinator of Maritime Administration (1983, 1984).
B.S., Iowa State University; M.B.A., University of Houston, 1977.
- PINEBROOK, William E.**, Associate Professor of Marine Engineering (1984).
B.S., Royal Netherlands Naval Academy, 1955; B.S., New York Institute of Technology, 1976; M.E., Florida Atlantic University, 1978; Ph.D., University of Houston, 1982.
- RAY, Sammy M.**, Professor of Marine Biology; Dean, Moody College of Marine Technology, Coordinator of TAMU Graduate Programs in Galveston (1959, 1984, 1979).
B.S., Louisiana State University, 1942; M.S., Rice University, 1952; Ph.D., Rice University, 1954.

- RENFRO, Dennis D.**, LT, USN., Assistant Professor of Naval Science (1982).
B.S., Texas A&M University (Galveston), 1978.
- ROBERTS, Kathleen P.**, Lecturer in General Academics (Library Science) (1980).
B.S., Auburn University, 1955; N.Ln., Emory University, 1967.
- ROPER, Benjamin F.**, LT, USN, Assistant Professor of Naval Science (1984).
B.S., Stephen F. Austin State University, 1977.
- SCHLEMMER, Frederick C. II**, Assistant Professor of Marine Sciences (Oceanography) (1978).
B.S., U.S. Naval Academy, 1965; M.A., University of South Florida, 1971; Ph.D., Texas A&M University, 1978.
- SCHMALZ, Thomas G.**, Assistant Professor of Marine Sciences (Chemistry, Computer Science) (1981).
B.S., Montana State University, 1970; Ph.D., University of Illinois, 1975.
- SCHOB, David E.**, Associate Professor of General Academics (History, Summer Cruise) (1970).
B.A., University of Illinois, 1963; M.A., 1965; Ph.D., 1970.
- SCHWARZ, John R.**, Associate Professor of Marine Biology and Head of the Department (1976, 1979, 1983).
B.S., Rensselaer Polytechnic Institute, 1967; Ph.D., Rensselaer Polytechnic Institute, 1972.
- SEITZ, William A.**, Associate Professor of Marine Sciences (Chemistry) and Head of the Department (1977, 1980).
B.A., Rice University, 1970; Ph.D., University of Texas at Austin, 1973.
- SHARMA, Jagat N.**, Lecturer in Maritime Systems Engineering (1984).
B.S., Muzaffarpur Institute of Technology, 1961; M.S., University of Florida, 1973; Ph.D., University of Delaware, 1979.
- SHIPMAN, Natalie W.**, Lecturer in General Academics and Head Librarian (1982).
B.A., Pennsylvania State University, 1971; M.S., Drexel University, 1973; M.S., University of Tennessee, 1980.
- SUEN, Ching Y.**, Assistant Professor of General Academics (Mathematics) (1984).
M.S. Tsing Hua University, 1978; Ph.D., University of Houston, 1983.
- SZUCS, Joseph**, Assistant Professor of General Academics (Mathematics) (1980).
B.S., Szeged University, 1965; Ph.D., Szeged University, 1973.
- TALWAR, Devki N.**, Assistant Professor of Marine Science, (Physics), (1982, 1983).
B.S., M.S., Agra University; Ph.D., Allahbad University, (India), 1976.
- VAN DER WERF, Peter**, Associate Professor of Marine Engineering and Head of the Department (1983, 1984).
B.E., University of New South Wales, Australia, 1962; M.E., 1964; Ph.D., 1966.
- VAN LOO, William C.**, Lecturer in Marine Engineering (1982).
B.S., City College of New York, 1969; M.A. Hofstra University, 1973.

WALLACE, Frederick H., Lecturer in Maritime Administration (1983).

B.A., Texas Christian University, 1974; M.A., Texas Christian University, 1976.

WALSH, John B., Assistant Professor of General Academics (Mathematics) (1984).

B.S., North Texas State University, 1983; M.S., Ph.D., University of Houston, 1976, 1983.

WANG, Y. H., P.E., Professor of Maritime Systems Engineering and Head of the Department (1980, 1981).

B.S., National Taiwan University, 1952; M.S., San Jose State University, 1962; Ph.D., University of Southern California, 1972.

WARDLE, William J., Associate Professor of Marine Biology and Vice President for Academic Affairs (1981, 1983).

B.S., Lynchburg College, 1963; M.S., Texas A&M University, 1970; Ph.D., Texas A&M University, 1974.

WEBB, James W., Assistant Professor of Marine Biology (1978, 1981).

B.S., University of South Carolina, 1966; M.S., University of Georgia, 1973; Ph.D., Texas A&M University, 1977.

WETTA, Frank, Lecturer in General Academics (History) (1972).

B.S., St. Louis University, 1964; M.A., St. Louis University, 1965; Ph.D., Louisiana State University, 1977.

WILSON, Gary F., Lecturer in General Academics (History) (1984).

B.A., Texas Wesleyan College, 1971; M.A., Ph.D., North Texas State University, 1979.

WILSON, Paul C., P.E., Lecturer in Maritime Systems Engineering (1981).

B.S., A&M College of Texas, 1948; M.S., University of Houston, 1974.

WOODS, Henry S., III, Assistant Professor of Marine Transportation (1984).

B.S., Maine Maritime Academy, 1966. M.S., University of Southern California, 1983.

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