



**TEXAS A&M UNIVERSITY
AT GALVESTON**

**1983-1984
CATALOG**

TEXAS A&M UNIVERSITY AT GALVESTON

**1983-1984
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 1983-84

SUMMER SESSION 1983

May 30	Monday. Registration for the first term and the 11-week semester.
May 31	Tuesday. First day of first term and 11-week semester classes.
June 2	Thursday. Last day for enrolling in the University for the first term and the 11-week semester and for adding new courses.
June 3	Friday. Last day for dropping courses with no record for the first term and the 11-week semester. Last day to apply for undergraduate degrees to be awarded in August.
June 4	Saturday. T/S TEXAS CLIPPER departs on summer cruise.
June 10	Friday. Last day for dropping courses with no penalty for the first term (Q-drop).
June 23	Thursday. Last day for dropping courses with no penalty for the 11-week semester (Q-drop).
July 4	Monday. Independence Day holiday.
July 5	Tuesday. Last day of first term classes.
July 6	Wednesday. First term final examinations.
July 7	Thursday. Registration for the second term.
July 8	Friday. First day of second term classes.
July 12	Tuesday. Last day for enrolling in the University for the second term and for adding new courses.
July 13	Wednesday. Last day for dropping courses with no record for the second term.
July 20	Wednesday. Last day for dropping courses with no penalty for the second term (Q-drop).
July 20	Wednesday. Last day for dropping courses with no penalty for the second term (Q-drop).
August 7	Sunday. T/S TEXAS CLIPPER returns from summer cruise.
August 10	Wednesday. Last day of 11-week semester classes.
August 11	Thursday. Last day of second term classes.
August 12	Friday. Second term and 11-week semester final examinations.
August 13	Saturday. Commencement for first and second term and 11-week semester graduating students.

FALL SEMESTER 1983

August 24-26	Wednesday through Friday. Orientation, delayed registration, adds and drops. Entering First Year License Option Cadets receive Midshipman Application Packets during Naval Science Indoctrination.
August 29	Monday. First day of fall semester classes.
September 2	Friday. Last day for enrolling in the University for the fall semester and for adding new courses.
September 9	Friday. Last day for applying for degrees to be awarded in December.
September 13	Tuesday. Last day for dropping courses with no record. Midshipman Application Packets from all First Year License Option students due to be returned to Department of Naval Science.
September 30	Friday. Last day for dropping courses with no penalty (Q-drop).
November 16	Wednesday. Preregistration for the 1984 spring semester.
November 24-25	Thursday through Friday. Thanksgiving holidays.
December 9	Friday. Last day of fall semester classes. Last day to withdraw officially from the University.
December 10	Saturday. Commencement.
December 12-15	Monday through Thursday. Fall semester final examinations.

SPRING SEMESTER 1984

January 11-13	Wednesday through Friday. Orientation, delayed registration, adds and drops.
January 16	Monday. First day of spring semester classes.
January 20	Friday. Last day for enrolling in the University for the spring semester and for adding new courses.
January 31	Tuesday. Last day for dropping courses with no record.
February 3	Friday. Last day for applying for degrees to be awarded in May.
February 17	Friday. Last day for dropping courses with no penalty (Q-drop).
March 12-16	Monday through Friday. Spring break.
April 18	Wednesday. Preregistration for the 1983 fall semester.
May 4	Friday. Last day of spring semester classes. Last day to withdraw officially from the University. Convocation.
May 5	Saturday. Commencement.
May 7-10	Monday through Thursday. Spring semester final examinations.

SUMMER SESSION 1984

June 4	Monday. Registration for the first term and the 11-week semester.
June 5	Tuesday. First day of first term and 11-week semester classes.
June 7	Thursday. Last day for enrolling in the University for the first term and 11-week semester and for adding new courses.
June 8	Friday. Last day for dropping courses with no record for the first term and the 11-week semester.
June 15	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 28	Thursday. Last day for dropping courses with no penalty for the 11-week semester (Q-drop).
July 4	Wednesday. Independence Day holiday.
July 10	Tuesday. Last day of first term classes.
July 11	Wednesday. First term final examinations.
July 12	Thursday. Registration for the second term.
July 13	Friday. First day of second term classes.
July 17	Tuesday. Last day for enrolling in the University for the second term and for adding new courses.
July 18	Wednesday. Last day for dropping courses with no record for the second term.
July 25	Friday. Last day for dropping courses with no penalty for the second term (Q-drop).
August 15	Wednesday. Last day of 11-week semester classes.
August 16	Thursday. Last day of second term classes.
August 17	Friday. Second term and 11-week semester final examinations.
August 18	Saturday. Commencement for first and second term and 11-week semester graduating students.

**TEXAS A&M UNIVERSITY
AT GALVESTON**



Texas A&M University at Galveston
Mitchell Campus in 1971



Texas A&M University at Galveston
Mitchell Campus in 1982

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 directly, or 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 140 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.

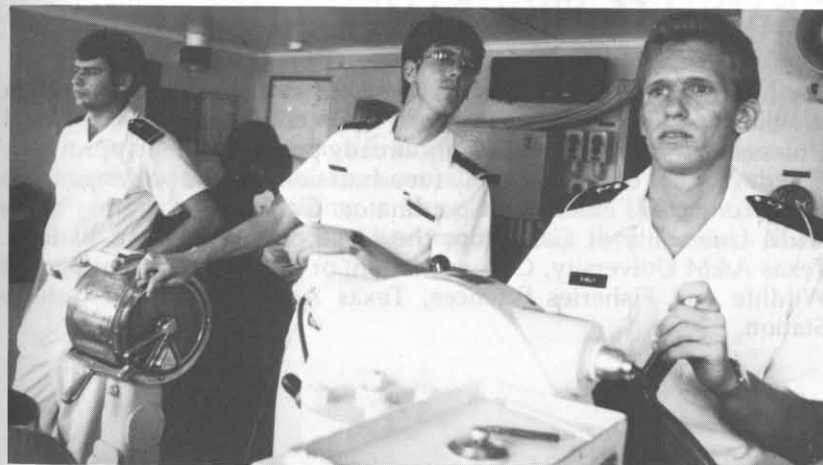
The Texas A&M University at Galveston Library holds 35,000 volumes and has access to over 20,000 relevant volumes at the University of Texas Medical Branch and the National Marine Fisheries Service in Galveston. The proximity of these special collections provides students and staff with access to a wide range of periodical literature in the fields of science and technology. In addition, the Library is a member of the AMIGOS Bibliographic Council, which provides the user with access to material throughout the Southwest.

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 near-shore 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 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

The Summer School at Sea program permits recent high school graduates to enroll at Texas A&M University at Galveston as freshmen and earn their first six semester hours of college credit during the annual summer training cruise of the **T/S TEXAS CLIPPER**. 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.



Several December 1982 graduates of Texas A&M University at Galveston were selected for inclusion in *Who's Who Among Students in American Universities and Colleges*. They are (front row, from left) Peter Cleary, Peter Ravella, Luis Innes, (second row) TAMUG President Dr. William H. Clayton, Mark Sampson, Wayne Young, Christopher Keep and Dr. Sammy Ray, Acting Dean of Moody College of Marine Technology.

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 descriptions that follow are not provided in the nature of a contractual obligation. 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, Texas A&M University, College Station, Texas 77843. 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 will send the applicant a letter of acceptance and notify TAMUG of the 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 Student Records Office, 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, from high school counselors, or from the TAMU Office of Admissions.
2. Transcripts: Ask the high school counselor or registrar to forward an official transcript to the Office of Admissions at College Station. 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 be at the level of Algebra I, or higher.
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

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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 Boards.

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 with the Director of Admissions is also required. Further information may be obtained from the Office of Admissions.

Provisional Admissions Program

Applicants who do not meet all the admission requirements may be considered for admission under the provisional program if space is available. This program is for those high school graduates who have never attended college and who meet all admission criteria except the minimum score on the Scholastic Aptitude Test.

A student wishing to take this option will be required to successfully complete a specified program at Texas A&M University at College Station and make at least 2.0 GPR on assigned courses in order to continue as a student at Texas A&M University at Galveston. Information concerning this program is available from the Office of Admissions, Texas A&M University, College Station, Texas 77843.

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 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, College Station, Texas 77843. 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. 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.

ADMISSION BY INDIVIDUAL APPROVAL

The Dean of Admissions and Records, Texas A&M University, College Station, Texas 77843, 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.

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 Student Records Office. Schedules of classes are available at the Student Records Office 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 of the department can ordinarily obtain the counseling assistance they need concerning academic program planning and similar curriculum-related matters from department 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 various 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 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

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.

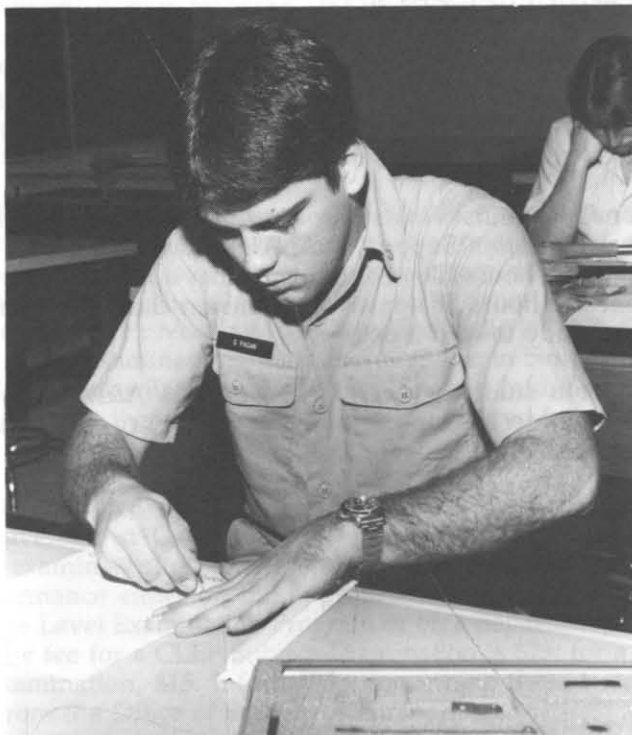
ACADEMIC CREDIT FOR MILITARY SERVICE

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 completed six months (under RFS 1955) but less than one year of active duty in the armed forces of the United States may be given academic credit for the first year of ROTC. Such students may be given academic credit for two semester hours of 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

A handbook entitled **University Regulations** is 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 this handbook carefully and to use it 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, except that 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) 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 sent to students at their local addresses 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 sent directly to the student. Students may request, through the Student Records Office, that copies of their grades be sent to their parents or guardians. Parents of guardians may also receive grade reports if they certify that the student is carried as a dependent on the parent's federal income tax report.

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 regular 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 regular 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. The student is expected to be present in person at the graduation exercises, unless registered in absentia or excused by his or her academic dean.

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 or a lesser degree or academic certificate, 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:

During the semester or summer session in which the degree is to be conferred, a student must be officially registered in the University. 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.

For graduation with honors eligibility requirements, see *University Regulations* (separate publication).

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 \$3,600 and \$4,600. 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 1983-84 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	39.00	39.00	19.50
Room	620.00	620.00	235.00
Board	640.50	640.50	
Room Deposit	100.00		
Identification Card	3.00		1.00†
Building Use Fees	45.00	45.00	18.00
	<u>\$1,507.50</u>	<u>\$1,404.50</u>	<u>\$298.50</u>

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	39.00	39.00	17.60*
Room	620.00	620.00	290.00
Board	640.50	640.50	610.00
Room Deposit	100.00		
Identification Card	3.00		1.00†
Cruise Fee			490.00
Building Use Fee	54.00	54.00	12.00
	<u>\$1,546.50</u>	<u>\$1,443.50</u>	<u>\$1,480.60</u>

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

†Applies 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.

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 in 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 and alien students pay forty dollars (\$40.00) per semester credit hour.

Students enrolled in license option curricula, whether resident or non-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 summer and 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.

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 \$3.25 per semester credit hour (not to exceed \$39.00) per semester (or \$19.50 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.

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.

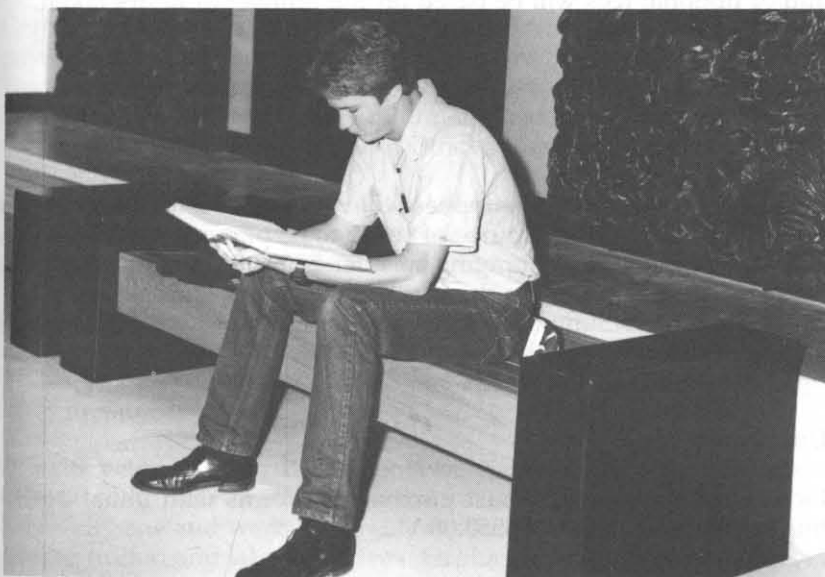
A deposit of \$100.00 is required to apply for a room in a residence hall. This fee will be retained as a deposit against damage or late cancellation, or to keep the application on active file. A reservation may be cancelled and deposit refunded upon written request prior to July 1 for the fall semester, 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 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 approved to take a departmental examination 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 \$5.00 per semester and summer 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 \$39 will also be assessed. All other mandatory and/or optional fees will be based on the number of hours taken.

OTHER EXPENSES**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 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.

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 in absentia are exempt from all fees except tuition.

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 shall be made to students officially withdrawing according to the following withdrawal schedule:

Tuition, Student Services Fee, Laboratory Fee and Residence Hall Rent	
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
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

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.

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 \$10.00. The penalty increases to \$25.00 fifteen days after the date of the first notice and 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 scholastic probation are not eligible for employment with the University.

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.

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 A&M students enrolled in Galveston and College Station. 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 senior medical students operate an on-board dispensary. All services provided on board are free of charge. Should a student require hospitalization or evacuation, the student will be billed for costs incurred.



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 Northern Student Center. The Northern 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 Northern 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, University Rowing Club, and Dormitory Association.

Student Publications

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

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.

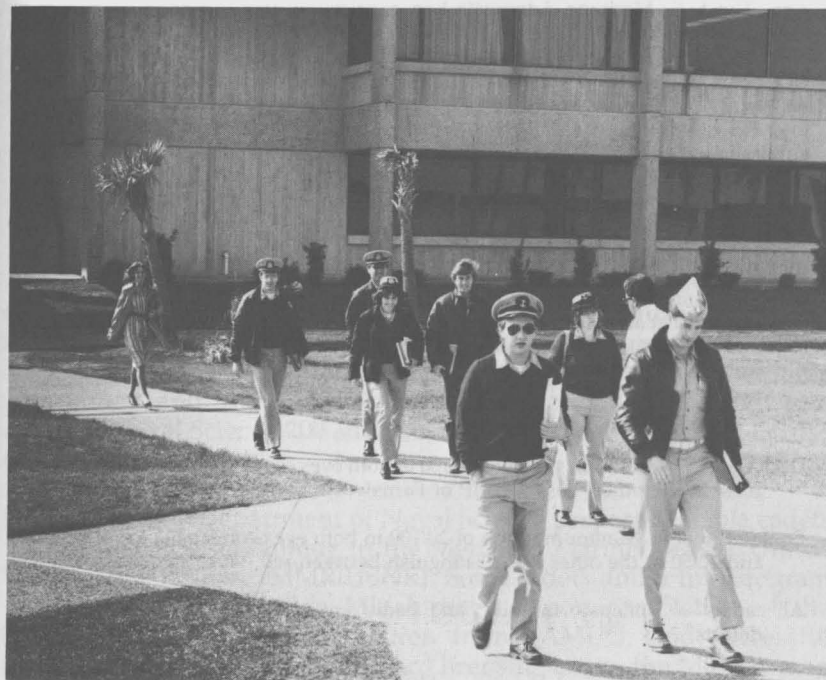
Athletics

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 soccer and softball teams which compete in local city leagues.

CORPS OF CADETS

Students who elect to pursue one of the University degree programs leading to a United States Coast Guard License as a Merchant Marine Officer are required to join the University's Corps of Cadets. The objective of the Corps of Cadets Program is to provide 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 foreign nationals to participate in the Corps of Cadets. They will not be eligible to be examined for a license as an officer in the U.S. Merchant Marine.



ADMISSION TO A LICENSE OPTION CURRICULUM

Students who meet the admission criteria established by the 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, and 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 a license option degree program is not final approval for appointment in that option nor acceptance in the Corps of Cadets. 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 to commit 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 Farnsworth 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, 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. 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 six years.
2. Sail on their applicable license at sea, for four months every two consecutive years, for six years.
3. Complete two weeks of active duty for training in the Navy, every year for six years.
4. Submit an annual report to the administrator of the MMR/USNR Program.

Active duty service may be requested under this program for a period of 3-6 years. 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 of the State Maritime Colleges the opportunity to apply for direct commissions involving extended active duty in the Coast Guard Reserve. Applications may be initiated either during a cadet's final year prior to graduation or after graduation provided the age requirements are met.

Some specific requirements of the MARGRAD program are:

1. Age: As of July 1 of the year of commissioning an applicant must be between 21 and 26 for appointment as ensign and between 21 and 27 for appointment as lieutenant (junior grade).
2. Education: Must be a graduate of a State or Federal maritime college.
3. Experience and professional qualifications: (a) Must hold a Third Mate's or Third Assistant Engineer's license to apply for the grade of ensign. (b) In addition to (a) above, applicants for appointment to grade of lieutenant (junior grade) must have served one or more years onboard vessels of the United States in the capacity of licensed officer.
4. Must be a citizen of the United States.
5. Must be physically qualified.

STUDENT INCENTIVE PAYMENTS

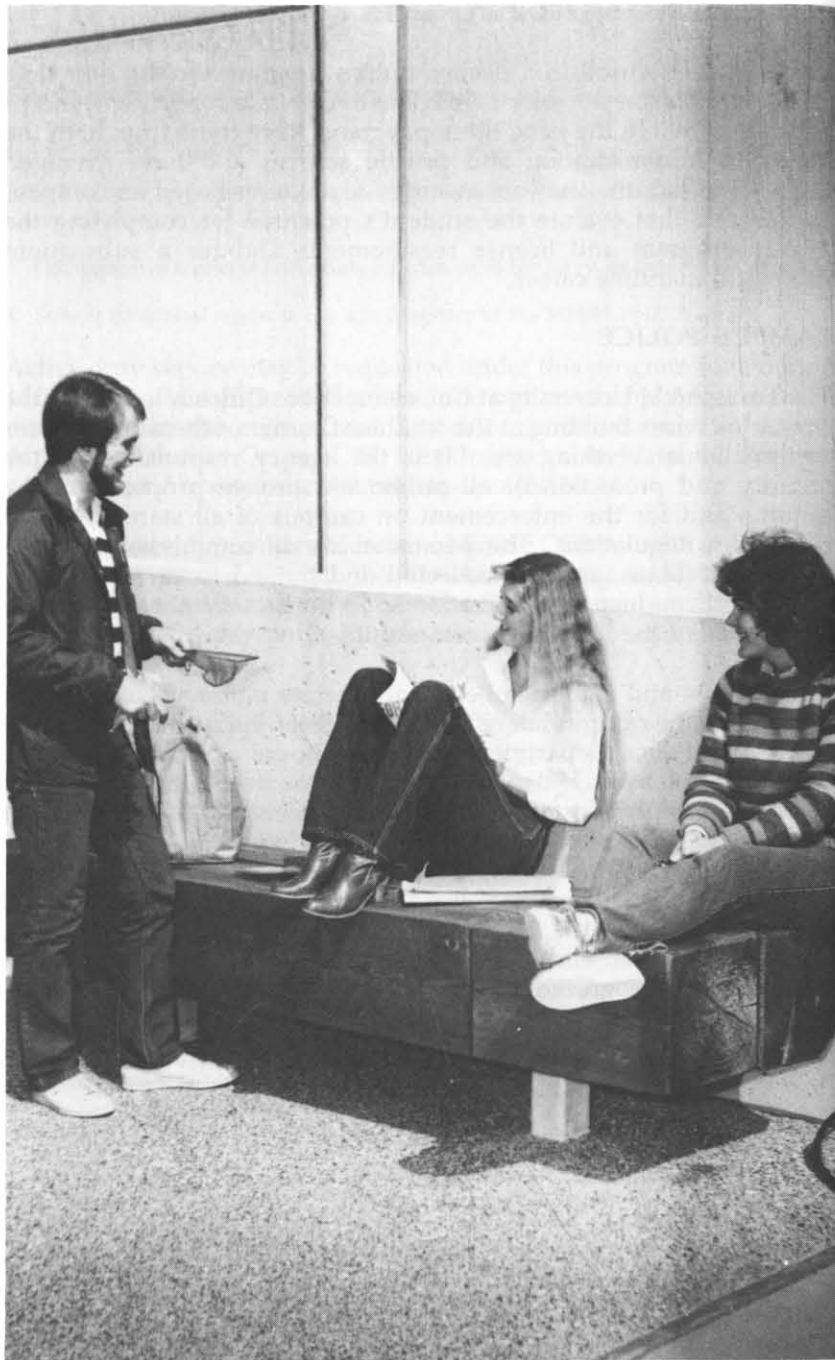
Students who enroll in a license option program for the first time during a fall semester may be eligible to compete for Student Incentive Payments. In the past, these payments have come from both the Maritime Administration and private sources and have averaged \$100.00 per month. They are awarded to 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.

CAMPUS POLICE

The Texas A&M University at Galveston Police Office is located in the Central Services Building at the southeast corner of the campus, near the small-boat berthing area. It is the agency responsible for the security and protection of all public and private property on the campus and for the enforcement on campus of all state laws and University Regulations. The personnel are all commissioned Peace Officers of Texas, carefully selected and trained to carry out their duties and conduct their operation so as to maintain the respect and confidence of the University community.

All students and staff members who operate motor vehicles and/or bicycles on the campus are required to register their vehicles with the University Police Department within 48 hours after arrival on the campus. Students in University housing must store personal firearms with the Department for safekeeping. They may be checked out at any time by their owners.

Members of the University Police Department operate the "Lost and Found" office for the University, conduct safety meetings, drug abuse discussions, and engage in other educational activities when requested by recognized student groups.



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)	1
Naval Science or Elective†		1	Naval Science or Elective†		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. 101 Principles of 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	(0-3)	1	Chem. 238 Organic Chemistry Lab	(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
License Prep	(4-0)	R	MARB 420 Comparative Physiology	(3-3)	4
MARB 310 Introduction to Cell Biology	(3-3)	4	MARB 435 Invertebrate Zoology ...	(3-3)	4
NAUT 302 Seamanship III	(1-3)	2	MARB 450 Developmental Biology of Marine Organisms	(3-3)	4
NAUT 404 The Navigator	(2-3)	3			<u>15</u>
Pol. S. 206 American National Government	(3-0)	3			
Stat. 302 Statistical Methods	(2-2)	3			
		<u>19</u>			

TOTAL HOURS — 151

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

*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.

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	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
Hist. 105 History of the U.S.*.....	(3-0)	3	NAUT 103 Maritime Orientation and Lifesaving.....	(2-3)	3
MARE 101 Engineering Analysis...	(0-3)	1	Phys. 218 Mechanics.....	(3-3)	4
Math. 151 Engineering Mathematics I.....	(3-2)	4			17
		17			

SUMMER SESSION

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

SOPHOMORE YEAR

E.T. 180 Machine Production Technology I.....	(0-3)	1	E.T. 280 Machine Production Technology II.....	(0-3)	1
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 and Magnetism.....	(3-2)	4
Math. 253 Engineering Mathematics III.....	(3-2)	4	MARE 209 Mechanics of Materials.....	(3-0)	3
Phys. 219 Electricity.....	(3-3)	4	MARE 303 Marine Thermodynamics.....	(3-0)	3
Pol. S. 206 American National Government.....	(3-0)	3	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

Econ. 203 Principles of Economics.....	(3-0)	3	Engl. 301 Technical Writing.....	(3-0)	3
MARE 210 Marine Construction Materials.....	(3-2)	4	MARE 308 Electrical Machinery.....	(3-2)	4
MARE 304 Marine Thermodynamics.....	(3-0)	3	MARE 410 Marine Power Plants...	(2-2)	3
MARE 307 Electrical Circuits.....	(3-2)	4	MARE 412 Ship Structures and Stability.....	(3-0)	3
MARE 310 Engineering Computation.....	(3-0)	3	M.E. 344 Fluid Mechanics.....	(3-0)	3
		17			16

SUMMER SESSION

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

SENIOR YEAR

MARE 301 Heat Transfer.....	(3-0)	3	Hist. 106 History of the U.S.*.....	(3-0)	3
MARE 411 Marine Mechanical Design Technology.....	(3-0)	3	MARE 415 Introduction to Marine Engineering Systems Design.....	(3-0)	3
MARE 414 Ship Automation I.....	(4-0)	4	MARE 416 Engineering Lab I.....	(0-4)	1
Elective (Social Science or Humanities)†.....		3	MARE 419 Marine Engineering Design Projects.....	(2-6)	4
Elective†.....		3	Technical Elective†.....		3
		16	Elective†.....		3
					17

TOTAL HOURS: LICENSE OPTION 147

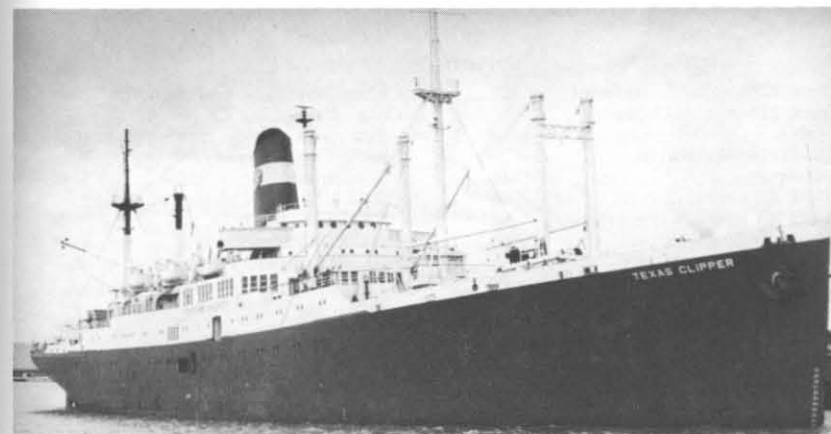
NON-LICENSE OPTION 135

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

*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.



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. 101 Principles of 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.

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	MARS 310 Field Methods	(1-6)	3
Geog. 210 Marine Geography	(3-0)	3	MARS 440 Marine Biology	(3-3)	4
Geol. 101 Principles of 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 485 Problems in Marine Sciences	(3-0)	3
MASE 375 Science of Fluids	(3-0)	3	MARS Options†	(3-0)	3
MARS Options‡	(3-0)	3	Electives*		9
Electives*		9			15
		16			

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, MARS 450, or MARS 430.



Curriculum in MARINE SCIENCES WITH A LICENSE OPTION

This option leading toward a U.S. Coast Guard license 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 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
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. 101 Principles of 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

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

TOTAL HOURS — 148

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

*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.

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

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



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
		16			17

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
MART 301 Ocean Transportation I	(3-0)	3	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
		17			16

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 321 Maritime Law II	(4-0)	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
		18			18

SENIOR YEAR

Acct. 327 Intermediate Accounting	(3-0)	3	B. Ana. 424 Economics of Transportation	(3-0)	3
B. Ana. 459 Analytical Models	(3-0)	3	Econ. 312 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			15
		18			

TOTAL HOURS — 135

*American History Electives: Must be chosen from those courses approved by the Chairman, Department of General Acaemics

†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. 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 MASE 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 Marine Thermodynamics.....	(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 Electrical Circuits.....	(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
Ocn. 401 Introduction to Oceanography.....	(3-0)	3
O.E. 400 Basic Coastal Engineering.....	(3-0)	3
Science Elective (Biology)*.....		3
Elective (Social Sciences)*.....		3
Elective (Technical)*.....		3
		37

**COASTAL STRUCTURES OPTION
REQUIREMENTS**

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 301 Fluid Mechanics and Heat Transfer.....	(3-0)	3
MARE 412 Ship Structures and Stability.....	(3-0)	3
MASE 230 Modern Physics Lab.....	(0-3)	1
MASE 411 Advanced Hydrodynamics I.....	(3-0)	3
M.E. 344 Fluid Mechanics.....	(3-0)	3
M.E. 459 Mechanical Vibration.....	(3-0)	3
		37

**HYDROMECHANICS OPTION
REQUIREMENTS**

C.E. 311 Fluid Dynamics.....	(3-0)	3	Mathematics II.....	(3-0)	
C.E. 336 Fluid Dynamics Lab.....	(0-2)	1	M.M. 460 Introduction to Continuing Mechanics.....	(3-0)	3
MARE 301 Heat Transfer.....	(3-0)	3	NAUT 202 Naval Architecture II.....	(3-0)	3
MARE 207 Electricity and Magnetism.....	(3-2)	4	MARS 410 Physical Processes in the Marine Environment.....	(3-0)	3
MASE 230 Modern Physics Lab.....	(0-3)		Ocn. 401 Introduction to Oceanography.....	(3-0)	3
MASE 411 Advanced Hydrodynamics I.....	(3-0)	3	Electives*.....		3
MASE 461 Electronic Instrumentation.....	(2-3)	3			
Math. 311 Topics in Applied Mathematics I.....	(3-0)	1			3
Math. 312 Topics in Applied Mathematics.....		3			1
					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: M.E. 211 or 213 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.

ELECTRICAL ENGINEERING (E.E)

- 485. Problems. Credit 1 to 3 each semester.** Problems of limited scope approved on individual basis intended to promote independent study. Results of study will be presented in writing, and an oral presentation to staff and students will be required. Prerequisites: Senior classification; 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.

ENGINEERING TECHNOLOGY (E.T.)

- 180. Machine Production 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, sawing, semiautomatic lathes, introduction to N.C.
- 207. Metallic Materials. (2-3). Credit 3.** Introduction to structure, properties and engineering application of ferrous and nonferrous metals, destructive and nondestructive testing, protective coatings, strengthening and heat treatment. Laboratory includes metallographic procedures, mechanical testing, heat treatment, surface treatment, creep, corrosion testing, recrystallization and failure analysis. Prerequisite: Chem. 102 or 106.
- 280. Machine Production Techniques II. (0-3). Credit 1.** Advanced machine operations; use of jigs and fixtures in the manufacturing of interchangeable parts. Machining of metal with standard and production machine tools. Comparison of numerical control operations with production machine operations. Assembly of the finished product using interchangeable parts. Prerequisite: E.T. 180.
- 380. Numerical Control and Computer-Aided Manufacturing. (2-3). Credit 3.** Numerically controlled machine tools and other computer-aided manufacturing systems. Types of machines and their applications, tooling systems and economic justification. Prerequisite: E.T. 280.
- 481. Seminar. (1-0). Credit 1.** Presentation of selected topics from current literature and related industrial operations in various technical areas. Films showing practical application of manufacturing and industrial processes. Lectures from industrial representatives. Prerequisite: Senior classification.
- 485. Problems. Credit 1 to 3 each semester.** Permits work in a special problem area on an individual basis with the intent of promoting independent reading, research and study; to supplement existing course offerings or subjects not presently covered. Prerequisites: Senior classification and approval of department head.

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.

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, 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.
- 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.

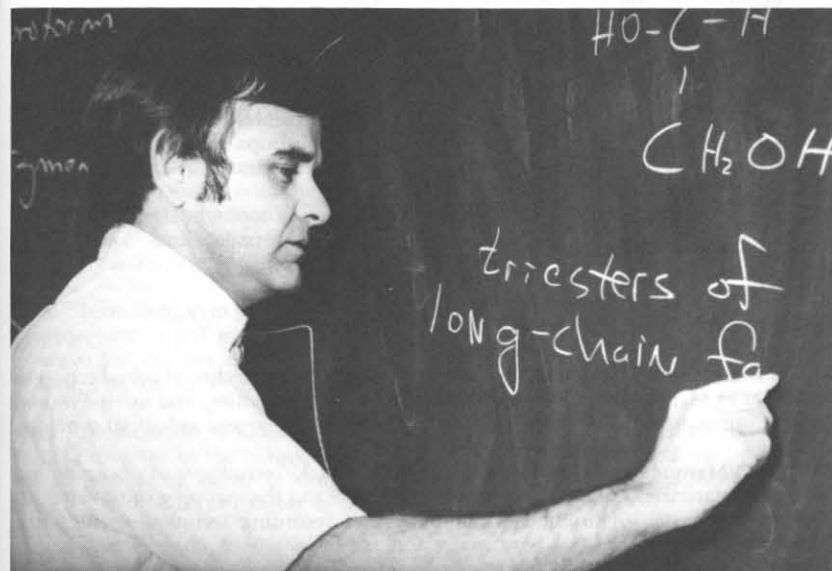
MARINE ENGINEERING (MARE)

- 101. Engineering Analysis. (0-3). Credit 1.** Methods available for solution of engineering problems. Introduction to numerical analysis, FORTRAN, use of hand-held calculators.

- 105. Engineering Mechanics I. (3-0). Credit 3.** Basic concepts of force, mass and acceleration are covered for particles and rigid bodies. Center of gravity, analysis of structures, friction, moments of inertia. Prerequisite: Math 152 or registration therein.
- 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 cycle 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; graphical and algebraic 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. Practice includes measurement of circuit phenomena. Prerequisite: Math. 253; Phys. 219.
- 209. Mechanics of Materials. (3-0). Credit 3.** Fundamental principles underlying analysis and design of machine members subjected to various combinations of loading. Theoretical and empirical basis for material specification formulas as found in United States Coast Guard Marine Engineering Regulations. Prerequisite: MARE 105.
- 210. Marine Construction Materials. (3-2). Credit 4.** Analysis of properties of solid materials as related to marine engineering design and applications. Introduction to metallurgical processes. Prerequisites: Chem. 102; MARE 209.
- 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. Fluid Mechanics and Heat Transfer. (3-0). Credit 3.** Conduction, convection and radiation separately and in combination. Steady and unsteady states, mathematical treatments, graphical and numerical solutions, dimensional analysis. Prerequisites: Math. 308; M.E. 344 (concurrent registration); MARE 303.
- 303. Marine Thermodynamics. (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: MARE 206.

- 304. Marine Thermodynamics. (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 and elementary amplifiers are introduced. Prerequisites: MARE 207; Math. 308.
- 308. Electrical Machinery. (3-2). Credit 4.** Principle 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.
- 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.
- 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 Mechanical Design Technology. (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; M.E. 344 or registration therein.
- 414. Ship Automation I. (4-0). Credit 4.** Linear servomechanism theory including transformation mathematics (Laplace transformation), the transfer function feedback, stability analysis and graphical techniques. Prerequisite: MARE 307.
- 415. Introduction to 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 I. (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.
- 420. Ship Automation II. (3-2). Credit 4.** Continuation of MARE 414. Use of frequency response and S-plane methods in control systems design. Laboratory work includes simulation of control systems design. Prerequisites: MARE 407, 414.
- 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.



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 system; organic and inorganic reactions; productivity; nutrient cycles, chemical compositions, formation of chemical sediments. Prerequisite: Chem. 102, or consent of instructor.
- 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.
- 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. Prerequisites: Biol. 113, 114, 123, 124 or equivalent; 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.
- 230. Modern Physics Laboratory. (0-3). Credit 1.** Experiments in atomic, nuclear and solid-state physics. Prerequisite: Phys. 220 or registration therein.
- 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, semi-submersible platforms, underwater pipelines, hydrofoils, etc. Prerequisite: C.E. 462.
- 412. Advanced Hydrodynamics II. (3-0). Credit 3.** Continuation of MASE 411 with emphasis on design calculations. Prerequisite: MASE 411.
- 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.

MECHANICAL ENGINEERING (M.E.)

- 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. Prerequisites: C.S. 202; M.E. 213 and 323 or 327 or equivalent.
- 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. Prerequisites: C.S. 202; Math. 308; M.E. 213 or equivalent.

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.
- 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.

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, 1982)

- 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.
- ASHWAL, Lewis D.**, Lecturer in Marine Sciences (1982).
B.S., S.U.N.Y. at New Paltz, 1971; M.S., University of Massachusetts, 1974; Ph.D., Princeton University, 1979.
- BLACK, Sandra L.**, Lecturer in Maritime Administration (1981).
B.B.A., Sam Houston State University, 1977; M.B.A., Sam Houston State University, 1980.
- BLOZINSKI, Anthony P.**, Associate Professor of General Academics (Mathematics) and Head of the Department (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.
- CAILLOUET, Charles W.**, Lecturer in Marine Biology (1982).
B.S., Louisiana State University, 1959; M.S., Louisiana State University, 1960; Ph.D., Iowa State University, 1964.
- 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.
- CONGLETON, Carol A.**, Lecturer in General Academics (Mathematics) (1974).
B.S., North Texas State University, 1968; M.S., North Texas State University, 1970.

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

- CONGLETON, Michael W.**, Lecturer in Marine Sciences (1982).
B.A., North Texas State University, 1968; M.S., North Texas State University, 1972; Ph.D., North Texas State University, 1973; M.D., University of Texas Medical Branch, 1977.
- CONTI, Joseph O.**, Lecturer in Maritime Administration (1978).
B.S., University of Houston, 1974; M.Ed., University of Houston, 1975.
- 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.
- 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., Assistant Professor of Marine Engineering and Head of the Department (1980, 1982).
B.S., U.S. Naval Academy, 1954; M.S., Massachusetts Institute of Technology, 1960; M.B.A., George Washington University, 1970.
- DAWSON, Joseph G. III**, Assistant Professor of General Academics (History) (1979).
B.A., Louisiana State University, 1967; M.A., Louisiana State University, 1970; Ph.D., Louisiana State University, 1978.
- DEUTZ, Andre H.**, Assistant Professor of General Academics, (Mathematics), (1982).
Kandidaats, University of Amsterdam, 1972; Doctoral, University of Amsterdam, 1977; Ph.D. Wayne State University, 1981.
- 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.
- 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.
- GRIFFIN, Lawrence L.**, Assistant 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.
- HIPPLE, William J.**, Assistant Professor of Maritime Administration and Program Coordinator of Maritime Administration Curriculum (1980, 1982). (Business Administration).
B.S., United States Naval Academy, 1952; M.S., The George Washington University, 1966; Ph.D., The University of Texas at Austin, 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.
- HORN, Gayle A.**, Lecturer in Marine Engineering (1981).
B.A., University of Houston, 1974.
- HOWARD, Michael H.**, GMGC, USN, Instructor in Naval Science (1981).
Instructor's Training School. GMGA School.
- JAMIESON, Frank M.**, Lecturer in Maritime Administration (1981).
B.B.A., Texas A&M University, 1977; M.B.A., Texas A&M University, 1978.
- 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, 1975.
- 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 and Head of the Department (1976, 1981).
B.S., Tulane University, 1968; M.S., Texas A&M University, 1971; Ph.D., Texas A&M University, 1977.
- LATHAM, Robert F.**, Associate Professor of Marine Engineering (1980, 1983).
B.S., U.S. Naval Academy, 1945; M.A., University of Maryland, 1956.
- 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 General Academics (Geography) and Director, Coastal Zone Laboratory (1971, 1975).
B.A., California State College at Los Angeles, 1961; Ph.D., Louisiana State University, 1969.

McNULTY, James F., Assistant Professor of Marine Transportation and Head of the Department (1979).
B.S., Massachusetts Maritime Academy, 1953; B.A., Tufts University, 1961; M.S., George Washington University, 1966; Master of Marine Affairs, University of Rhode Island, 1975.

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.

MILLER, Marie L., P.E., Lecturer in Marine Engineering (1982).
B.S., Ecole Polytechnique Feminine, Paris, 1970; M.S., City College of New York, 1972.

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.

NEWELL, Charles R., Lecturer in Marine Engineering (1981).
B.S.E., University of Michigan, 1966; M.S.E., Cleveland State University, 1977.

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.

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.

PARRISH, William I., Assistant Professor of Marine Transportation (1982).
B.A., Tulane University, 1958; M.S., Shippensburg State College, 1971.

RAY, Sammy M., Professor of Marine Biology, Acting Dean, Moody College of Marine Technology, Coordinator of TAMU Graduate Programs in Galveston (1959, 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., Instructor of General Academics (Library Science) (1980).
B.S., Auburn University, 1955; N.Ln., Emory University, 1967.

RUEFLE, William, Instructor of General Academics (Political Science) (1980).
B.S., University of Miami, 1972; M.S., Florida State University, 1979.

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) (1970).
B.A., University of Illinois, 1963; M.A., 1965; Ph.D., 1970.

SCHWARZ, John R., Associate Professor of Marine Biology (1976, 1979).
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.

SHIPMAN, Natalie W., Assistant Professor of General Academics and Head Librarian (1982).
B.A., Pennsylvania State University, 1971; M.S., Drexel University, 1973; M.S., University of Tennessee, 1980.

SZUCS, Joseph, Assistant Professor of General Academics (Mathematics) (1980).
B.S., Szeged University, 1965; Ph.D., Szeged University, 1973.

TALWAR, Devki N., Lecturer in Marine Science, (Physics), (1982).
B.S., M.S., Agra University; Ph.D., Allahbad University, (India), 1976.

VAN LOO, William C., Lecturer in Marine Engineering (1982).
B.S., City College of New York, 1969; M.A. Hofstra University, 1973.

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 (1981) and Assistant Vice President for Academic Affairs (1981).
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.

WERNER, William P., MMCS, USN, Instructor in Naval Science (1982).
MM"A" School, 1960; Air Condition and Refrigeration School, 1964; Instructor's Training School, 1982.

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

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

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.

WOLF, Marilyn R., Lecturer in General Academics, (English), (1982).

B.A., University of Dallas, 1968; M.A., University of Dallas, 1971.

WONG, Ellen C., Instructor of General Academics (Library Science) (1980).

B.A., Providence College, 1965; M.L.S., George Peabody College, 1971.

YASER, Betty S., Lecturer in Maritime Administration (1982).

B.S., Georgetown University, 1961; Ph.D., Vanderbilt University, 1967.



Dr. William H. Clayton (left) and Captain Paul Kelly (right) watch Mrs. Mary Moody Northen (center) as Mrs. Northen steers the T/S TEXAS CLIPPER during the 1982 Summer Cruise.

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