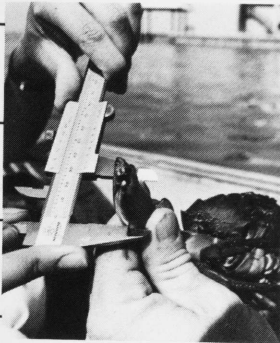


TEXAS A&M UNIVERSITY AT GALVESTON



87-88
Catalog



TEXAS A&M UNIVERSITY AT GALVESTON

1987-1988
CATALOG



A Part of The Texas A&M University System

THE TEXAS A&M UNIVERSITY SYSTEM

(Correct as of January 1, 1987)

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TEXAS A&M UNIVERSITY AT GALVESTON

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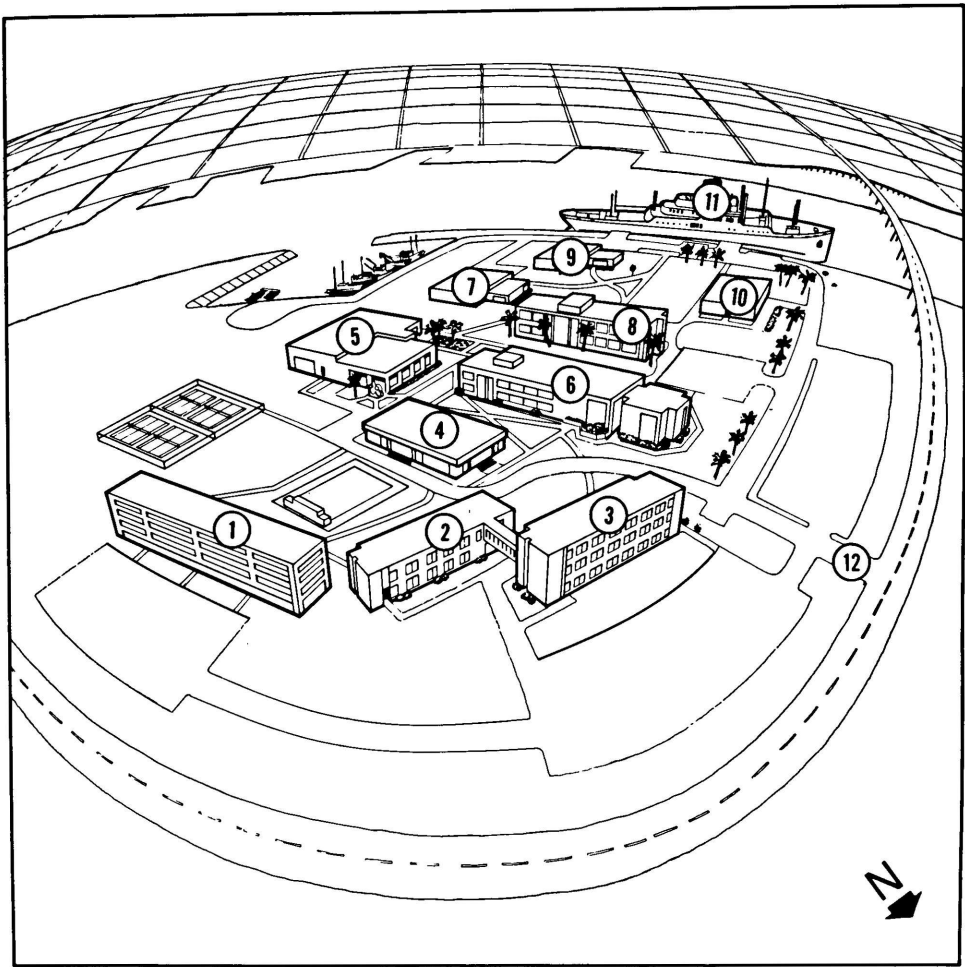
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THE ACADEMIC CALENDAR**SUMMER SESSION 1987**

June 4	Thursday. Preparatory cadets report for orientation and Summer School at Sea.
June 5	Friday. Registration for first term and 10-week semester.
June 8	Monday. First day of first term and 10-week semester classes. Late registration.
July 3	Friday. Independence Day holiday.
July 13	Monday. Registration for second term classes. 10-week semester classes will not meet except labs will meet.
July 14	Tuesday. First day of second term classes.
August 15	Saturday. Commencement.

FALL SEMESTER 1987

August 24-28	Monday-Friday. Orientation, delayed registration, adds and drops. Entering First Year License Option Cadets receive midshipman packets during Naval Science Orientation.
August 31	Monday. First day of fall semester classes.
November 26-27	Thursday-Friday. Thanksgiving holidays.
December 12	Saturday. Commencement.



Texas A&M University at Galveston
Campus Map

- | | |
|---|----------------------------------|
| 1. Dormitory C | 6. Classroom Laboratory Building |
| 2. Dormitory A | 7. Physical Services Building |
| 3. Dormitory B | 8. Emmett Oran Kirkham Hall |
| 4. Mary Moody Northen
Student Center | 9. Oceanography Building |
| 5. Jack Kenny Williams
Library | 10. Engineering Laboratory |
| | 11. Training Ship Texas Clipper |
| | 12. Campus Entrance |



INTRODUCTION

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 administrative officers and faculty of the University.

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

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

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 selected 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

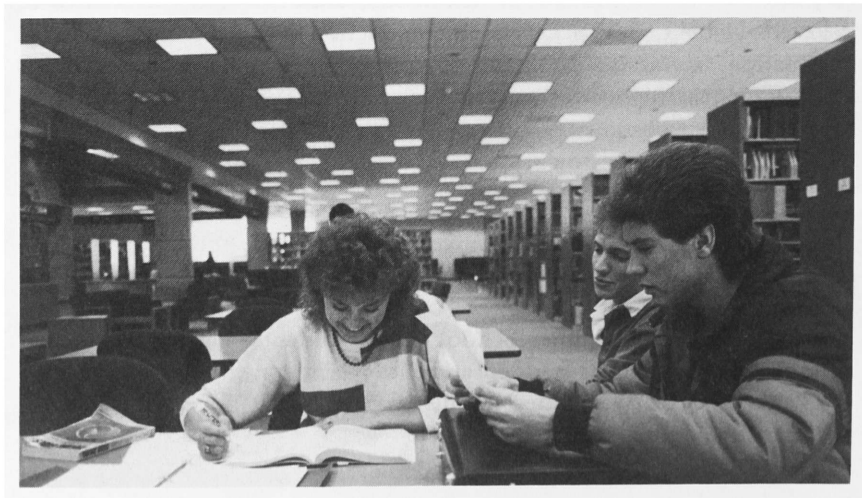
Texas A&M University at Galveston is fully accredited by the Southern Association of Colleges and Schools. In addition, the Marine Engineering curriculum is accredited by the Accreditation Board for Engineering and Technology.

The Jack K. Williams Library

The University Library is housed on the Mitchell Campus and is being developed continually 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, faculty and staff of the University along with many people in the marine and maritime-related fields of the Galveston area.

The Jack K. Williams Library has 27,000 square feet of space, with seating for 200 individuals, which includes 80 study carrels.

The Learning Resource Center, within the library, has 16 microcomputers, with software available for student use. Terminals networked to the Computer Center's PRIME 750 are available. The Public Access Catalog, the computerized card catalog, is incorporated into the system, allowing library access to any computer terminal on campus.



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 Naval Science detachment which offers courses in support of the license option program. Degree programs in Marine Engineering and Marine Transportation offer training toward qualification for professional licenses as engineering or deck officers in the Merchant Marine of the United States.

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

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



MOODY COLLEGE OF MARINE TECHNOLOGY

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

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

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

GRADUATE PROGRAMS

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

COASTAL ZONE LABORATORY

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

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

SUMMER SCHOOL AT SEA

Recent high school graduates who have never attended college may participate in the Summer School at Sea program conducted aboard the **T/S TEXAS CLIPPER** during the annual summer training cruise. In this program, the new students are allowed to choose two courses from offerings in English, history, computer science 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.

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





GENERAL INFORMATION

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 separate publication entitled Texas A&M University at Galveston Rules and Regulations which concerns other aspects of student life.

Students are required to complete the courses listed in a curriculum; however, the display of a curriculum does not necessarily indicate the length of time required to complete the 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 in a few cases may vary from actual course content due to advancements in the discipline, interests of individual professors or decisions to change the scope of a course. Thus, the catalog is not intended to be a contract, but simply an information bulletin and the University reserves the right to change any of the provisions. Some of the newer courses and changes in the courses are included in this catalog pending their approval by the Coordinating Board, Texas College and University System. A separate class schedule giving course offerings and other pertinent information is published for each semester and session and is available on request from the Admissions and Records Office. Students should refer to the class schedule for the offerings in any given semester. For various administrative reasons, such as 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 5 weeks each or one 10-week summer semester.

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

ADMISSION

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

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

When admission requirements have been satisfied, the Office of Admissions and Records will send the applicant a letter of acceptance. The Office of Student Services 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 (SAT) or on the American College Test (ACT). Those students who qualify for admission in all respects with the exception of having achieved the minimum score on the SAT or ACT may qualify for Provisional Admission (Page 14).

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

1. **Application for Admission:** Write to the Office of Admissions and Records, Texas A&M University at Galveston, P.O. Box 1675, Galveston, Texas, 77553, to obtain an application. Applications are also available at high school/college nights or from high school counselors.
2. **Transcripts:** Ask the high school counselor or registrar to forward an official transcript to the Office of Admissions and Records. This transcript must reflect grades complete through six semesters of high school work. The transcript should also reflect the rank in class and the list of courses which will be completed during the senior year. To be considered official, a transcript must bear an original signature of a school official and/or the school seal.
3. **Testing:** Arrange through the high school counselor to take the Scholastic Aptitude Test (SAT) or the American College Test (ACT). The English Composition Achievement Test and Mathematics Achievement Test of the College Board (CB) are highly recommended but not required. Designate the scores to be sent to Texas A&M University at Galveston (Code 6835 for SAT and Code 6592 for ACT) by the CB. It is recommended that the tests 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. Paper reports not coded for TAMUG or recorded on high school transcripts are not acceptable as official scores. Students are admitted on the basis of specified courses taken in high school, class rank, and SAT score.

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 application 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 or a minimum score of 24 on the American College 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		
Subject	Units	Remarks
English	4	Two units in a single foreign language may be substituted for one unit or 3 quarter units in English.
Social Science	2½	
Mathematics	3	These 3 units must include Algebra I, Algebra II and Geometry.
Science	2	It is preferred that these two units include biology, chemistry or physics.
Electives	4½	Recommended from the following subject areas: foreign languages, mathematics, science, social science, speech. Not more than three units in vocational subjects may be submitted as electives. Applicants for admission to engineering, mathematics and science are strongly advised to include at least ½ unit electives in advanced mathematics.
TOTAL	<hr style="width: 20%; margin: auto;"/> 16	

Tests Required of New Students

Texas A&M University at Galveston requires the Scholastic Aptitude Test (SAT) or American College Testing Program (ACT) tests as a part of its admission procedures for those applicants seeking admission to their first semester of college or university work. The English Composition Achievement Test and Mathematics Achievement Test (Level I or II) are also recommended but not required. When registering for these tests, students should designate that the results be sent to Texas A&M University at Galveston (Code 6835 for SAT and Code 6592 for ACT). Test scores will not be accepted unless furnished directly to Texas A&M University at Galveston or Texas A&M University in College Station by the College Board or the American College Testing Program.

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 and are stated in terms of a total score on the Scholastic Aptitude Test and the American College Test.

Standing in High School Graduating Class	Minimum Total Score Acceptable for Admission	
	SAT	ACT
Top 10%	No minimum	No minimum
Highest Quarter	800	18
Second Quarter	800	18
Third Quarter	900	21
Fourth Quarter	1000	24

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. Students who submit the ACT must achieve at least a 29 composite score and a 28 score on the ACT English portion. In addition, they must be recommended by their high school principal and counselor and have their parent's approval if under 18 years of age. Students must submit the results of the English composition and mathematics achievement tests. A personal interview is also required. Further information may be obtained from the Office of Admissions and Records.

Provisional Admission Program

Students are permitted to enroll in the University at the beginning of a fall or spring semester or at the beginning of the first summer session. The student will be required to complete a minimum of 12 semester credit hours of coursework during a fall or spring semester or a minimum of 9 semester credit hours of coursework during two consecutive summer sessions and are required to achieve at least a "C" average (2.00 grade point ratio) on all courses attempted in order to be allowed to continue to be enrolled in subsequent semesters. Students who attempt the program and fail to earn the required "C" average or better are not permitted to reenter under another provisional arrangement.

Concurrent Enrollment Program for High School Students

A student who is pursuing a high school diploma may be concurrently enrolled at TAMUG for a maximum course load of four semester credit hours during a semester or summer session upon recommendation from their high school and approval of the academic department at TAMUG which conducts the coursework desired to be taken. Such students must also satisfy the "Early Admission" requirements specified above. Credit for courses completed in this program may be obtained only after the student has graduated from high school and has entered TAMUG.

TRANSFER ADMISSION

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

An applicant must be eligible to return to the institution from which the transfer is sought. Applicants seeking admission to the license option curricula who have attended another maritime academy or college must provide a letter to the Office of Student Services from the superintendent of the other academy or college verifying that the student is eligible to return to that institution. Applicants must also submit a formal application for admission as well as two official transcripts of their record at each college or university previously attended as early as possible. This material should be sent to Office of Admissions and Records, Texas A&M University at Galveston, P.O. Box 1675, Galveston, Texas 77553. The applicant must have achieved an overall grade point ratio of 2.00 (C average) or better on the work attempted and must meet or surpass this same standard for each of the last two semesters of attendance, if in attendance two or more semesters. A ten-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 catalog 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 will be considered for admission to Texas A&M University at Galveston through the International Admissions Office of Texas A&M University, College Station, Texas. For information about application deadlines, admissions criteria, English language proficiency, and expenses, international students should request an application and 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 and September 1 for the spring semester.

Steps in Applying for International 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 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 or the American College Test (required for graduates of U.S. high schools). Test results must be sent directly to TAMUG or TAMU by the testing agency (SAT and TOEFL code is 6835, ACT code is 6592).

All students whose native language is not English are also required to take a rigorous oral and written examination prior to the semester of entry. These examinations are given at Texas A&M University, College Station. 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 on the College Station campus 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. The U.S. Immigration and Naturalization Service requires international students to 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 and Records at Galveston 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 institution attended 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 two or more semesters.

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

ADMISSION BY INDIVIDUAL APPROVAL

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

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

1. Submission of a completed application for admission.

2. The furnishing of evidence that the student's preparation is substantially equivalent to that required of other applicants and that the student possesses the ability and seriousness of purpose necessary to pursue studies with profit to himself or herself and to the satisfaction of the University.

ADMISSION OF STUDENTS NOT SEEKING A DEGREE

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

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

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

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

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

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

AUDITING OF CLASSES

Persons who are currently registered or who have earned 30 or more hours of college credit, and who desire to attend classes on an “auditing” basis, may do so by obtaining an audit request form from the Admissions and Records Officer during the late registration period of each semester. The Admissions and Records Officer will certify on that form that the eligibility criteria have been met. The prospective auditing student must then present the form to the Head of the academic department offering the course for approval. The Department Head will ensure that 1) the nature of the course is amenable to auditing (lecture only, not practice or laboratories), 2) that there is adequate room in the classroom and 3) that the course instructor is willing to accommodate the auditing student.

Once the Department Head has approved the request by signing the form, the form is presented to the Fiscal Office for final approval, where an auditing fee will be collected as follows:

- For students currently enrolled for formal courses: \$5
- For students not currently enrolled: \$25
- For persons over 65 years of age: no charge

Persons desiring to audit two or more courses must complete the entire process above for each course.

The auditing of courses involves listening and observing only. Auditing students are not entitled to participate in discussions or examinations and receive no course credit.

Auditing students are subject to the standards of student conduct specified in the current edition of *University Regulations TAMUG*, and violation thereof may constitute grounds for immediate cancellation of the auditing privilege by the course instructor without refund of fees.

Currently-enrolled students who audit a course are not subsequently permitted to earn credit by examination for the course. To earn credit, the student must register in and successfully complete the course.

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 10-week semester. Further information concerning registration may be obtained from the academic calendar published in this catalog or from the Office of Admissions and Records. Schedules of classes are available at the Office of Admissions and Records shortly before registration periods.

ORIENTATION CONFERENCES

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

ACADEMIC ADVISING

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

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

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

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 Office of Student Services at TAMUG. A fee is charged for these 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 tests 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 Services.

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 \$30; for a departmental examination, \$15. Information concerning these tests can be secured from the Office of Student Services.

Transfer of Credits

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

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

CONCURRENT ENROLLMENT AT TAMUG AND OTHER COLLEGES & UNIVERSITIES

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

CORRESPONDENCE COURSES

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

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

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

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

ACADEMIC CREDIT FOR MILITARY SERVICE

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

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

A student wishing to receive such credit should file a certified copy of his or her DD214 with the Office of Admissions and Records, so that credit may be allowed.

ACADEMIC RULES AND REGULATIONS

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

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

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

Incomplete

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

Drop/Add

A student may drop courses during the first 12 class days of a fall or spring semester and during the first four class days of a summer term or a 10-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 10-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 4th class day of a summer term or 10-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 10-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 be not 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 hour. 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 Admissions and Records Office. Students who withdraw during the first twelve 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 students who wishes to repeat a course to improve the grade in that course must do so before completion of a more advanced course in the same subject-matter field. The original grade will remain on the student's record, and both grades will be used in computing the GPR. An F previously made is not removed once the course is passed. Credit for a repeated course may only be used once toward degree requirements.

Semester Credit Hour

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

Grade Point Ratio

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

Grade Reports

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

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

Scholastic Probation

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

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

Distinguished Student and Dean's Honor Roll

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

Classification

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

Full-Time Student

A full-time undergraduate student is defined as one who is registered for 12 or more semester hours during a fall or spring semester, 6 hours or more in a summer term, and 12 hours in an 10-week summer semester.

Maximum Schedule

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

Transcripts

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

DEGREE INFORMATION

Texas A&M University at Galveston reserves the right to modify the curricula or withdraw any courses therefrom when it appears appropriate to do so. The policies and procedures in this catalog are currently in effect; however, the University reserves the right to make changes or modifications for good cause. The University has the right to rescind a previously granted degree (in corporation with Texas A&M University) if it becomes aware of information indicating that the degree never should have been granted.

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 students must complete, with at least a C average, one of the regular curricula of study leading to a degree.
2. A curriculum leading to a baccalaureate degree shall contain a minimum of 128 credit hours.
3. The total number of grade points earned at this institution in courses must be at least twice the number of hours which the student carried in courses at this institution. Grades of F or WF shall be included, except those grades and grades of D made in the freshman year or summer session preceding that year which are subsequently repeated at this University with a grade of C or better during the student's first four semesters. Such grades made in repeated courses do not replace the F, WF or D, but the original F, WF, or D may be waived for the purpose of graduation only. Grades of WP and Q shall be excluded.

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

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

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

RESIDENCE REQUIREMENT

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

For students enrolled in a license option curricula, participation in the Corps of Cadets is required every semester they are registered, which in most cases will be eight regular semesters and three summer cruises.

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

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

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

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

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

APPLICATION FOR A DEGREE

Formal application for degrees must be submitted to the Admissions and 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 Admissions and 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 of 3.700 through 3.899.
3. **Cum Laude:** A student may be graduated "Cum Laude" with a grade point ratio range of 3.500 through 3.699.

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

FINANCIAL INFORMATION

EXPENSES

The expenses for a regular session of nine months will vary with the individual concerned and with the course of study pursued. In the case of new students, the total cost should range between \$4,000 and \$5,000. 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 to \$1500, depending on the individual concerned. Non-resident students, other than those pursuing a license-option curriculum, should increase these estimated expenses by \$3,000 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 1987-88 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 (5 Weeks)
Tuition (see explanation of fees)	240.00	240.00	96.00
Student Services	45.00	45.00	22.50
Room	749.00	749.00	284.00
Board	735.25	735.25	
Room Deposit	100.00		
Identification Card	3.00		1.00†
Building Use Fees	45.00	45.00	18.00
Student Center Complex Fees	10.00	10.00	5.00
	<u>\$1,927.25</u>	<u>\$1,824.25</u>	<u>\$426.50</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)	360.00	360.00	125.00
Student Services	45.00	45.00	17.60*
Room	749.00	749.00	350.00
Board	735.25	735.25	692.00
Room Deposit	100.00		
Identification Card	3.00		1.00†
Cruise Fee			490.00
Building Use Fee	54.00	54.00	12.00
Student Center Complex Fees	10.00	10.00	5.00
	<u>\$2,056.25</u>	<u>\$1,953.25</u>	<u>\$1,692.60</u>

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

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

DROP/ADD REFUNDS

A student may drop courses during the first 12 class days of a fall or spring semester and during the first 4 class days of a summer term or an 10-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 a 10-week summer semester. Full refunds or supplemental billings will be made for courses dropped or added during these times. Notices of refunds due or amounts owed will be mailed to the student's local address. Refunds will be processed after the 12th class day.

WITHDRAWAL FROM THE UNIVERSITY

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

EXPLANATION OF FEES

Tuition

Resident students pay sixteen dollars (\$16) per semester credit hour, but the total of such charges shall be not less than one hundred dollars (\$100) per semester or fifty dollars (\$50) per summer term.

Non-resident and alien students pay one hundred twenty (\$120) per semester credit hour.

Students enrolled in license option curricula, whether resident or non-resident, pay twenty dollars (\$20) per semester credit hour but the total of such charge shall be no less than one hundred twenty-five dollars (\$125) per semester and one hundred twenty-five dollars (\$125) 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) fee.

Student Services

The student service fee is required of all students at the rate of \$3.75 per semester credit hour (not to exceed \$45) per semester (or \$22.50 per summer term). The student service fee for students on the summer cruise of the T/S TEXAS CLIPPER is \$4.40 per semester credit hour (not to exceed \$26.40). Student service fees finance health services, recreational activities, student government, student publications, student organizations, campus movies, intramural athletic programs and social activities.

Student Center Complex Fee

The Student Center Complex Fee is required for all students at the rate of \$10 per semester (\$5 per summer term or cruise). This fee will be used for the operation, maintenance, improvement and purchase of equipment for the Student Center Complex and for the acquisition or construction of additions to the complex.

Room, Rent, Board

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

A deposit of \$100 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. Upon withdrawal from the University, any debts owed the University by the student may be withheld from the housing deposit. A reservation may be cancelled and deposit refunded upon written request prior to July 1 for the fall semester, December 15 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 Services Office. The balance of the refund due will be issued through the Fiscal Office after deducting all debts owed by the student to the University. Seniority in campus housing and on the residence hall waiting list will be based upon the date of receipt of the room deposit; however, the deposit does not guarantee assignment to on-campus housing.

Building Use Fee

This fee of \$3 per semester credit hour is assessed to compensate for occupancy, services, use and/or availability of all or any of the property, buildings, structures, activities, operations and other facilities of the University.

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 a \$6 fee.

Laboratory Fees

A laboratory fee ranging from \$2 to \$8 is charged for each laboratory course each semester.

Parking Permit

All students driving automobiles on the campus must pay a fee of \$7.50 (\$5.00 for motorcycles) per regular semester and summer term for registration and parking.

10-Week Summer Semester

Students may register for 10-week summer semester courses during the first summer term registration. They will be charged the minimum tuition of \$100. The maximum student services fee of \$45 will also be assessed. All other mandatory and/or optional fees will be based on the number of hours taken.

Installment Plan

Certain students have the option of paying tuition and required fees in either two installments or four installments. Eligibility requirements can be obtained through the Fiscal Office.

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 and \$350. 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 \$ 850.

Mail Service Fee

The university operates a mail service for students wishing to receive mail on campus. The fee is \$7 per semester for each student, \$3.50 per summer term.

Late Registration Fee

Students registering after the final registration period will be assessed a \$10 fee.

Graduation Fee

There is a \$15 fee for graduation. This should be paid within the first two weeks of the student's final semester.

Other Items

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

EXEMPTIONS

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

Officers, enlisted persons, selectees, or draftees of the Army, Army Reserve, Army National Guard, Air National Guard, Air Force, Air Force Reserve, Navy, Naval Reserve, Marine Corps, Marine Corps Reserve, Coast Guard, or Coast Guard Reserve of the United States, who are assigned to duty in Texas, and their spouses and children, are entitled to pay the tuition fee required of Texas residents. (NOTE: Duty may be full-time or drill status as long as the unit to which assigned is permanently located in Texas.)

Teachers or professors employed at least one-half time on a regular monthly salary basis by institutions of higher education in Texas, and their spouses and children, are entitled to pay the tuition fee required of Texas residents.

Students who hold selected competitive academic scholarships of at least \$200 for the academic year or summer for which they are enrolled are entitled to pay the tuition fee required of Texas residents.

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.

Students registering concurrently at two Texas public institutions of higher education are subject to the following tuition procedure:

1. A student must register at the institution with the lower minimum tuition and pay the full tuition charge.
2. Generally, only the hourly rate is paid at the second institution. However, if the minimum amount is less at the first institution, then the student must pay the difference in the two minimums to the second institution, but not less than the hourly rate.

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	
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
Five-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 rereanted within ten days to a student residing in other than University-owned property. If the room is rereanted 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 or her family or for some other unavoidable cause, a *pro-rata* refund will be made, computed on a daily basis.

DROP/ADD REFUNDS

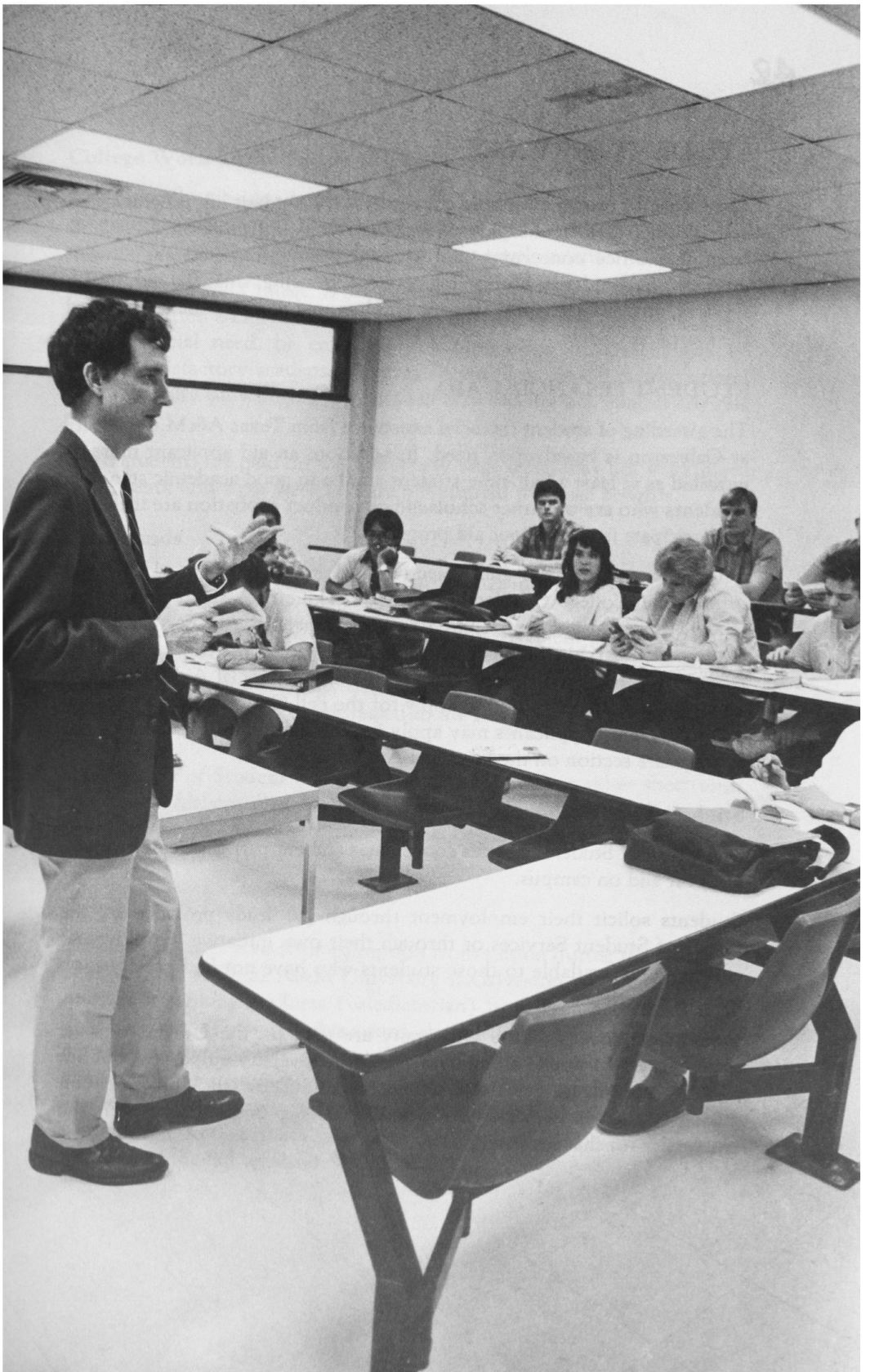
Full refunds or supplemental billings will be made after the 12th class day for courses dropped or added during the first 12 class days of a fall or spring semester and during the first four class days of a summer term or an 10-week summer semester. Notice of refunds due or amounts owed will be mailed to the student's local address. Consequently, the student is obliged to ensure that his or her correct local address and telephone number are on file in the Office of Admissions and Records.

REDUCTIONS

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

UNPAID CHECK

If a check accepted by the Fiscal Department is returned unpaid by the bank on which it is drawn, the person presenting it will be required to pay a penalty of \$15 in the form of cash or money order and, if not redeemed, the student may be dropped from the rolls of the University. In addition, the check may be turned over to the District Attorney for prosecution. A student dropped from the rolls of the University for failure to redeem an unpaid check within the grace period is eligible for reinstatement after payment of penalties, a \$50 reinstatement fee and redemption of the check.



STUDENT SERVICES

The Office of Student Services 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 Services coordinates student part-time employment, both off and on campus.

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

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

College Work-Study Program

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

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

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

Loan Funds

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

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

Valedictory Scholarships

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

Opportunity and Academic Achievement Awards

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

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

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

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

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

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

Veterans and War Orphans Services

The Financial Aid Office will assist eligible students in securing the benefits and services provided by the Veterans Administration. Students receiving Veterans Administration Educational benefits must maintain a 2.00 minimum cumulative grade point ratio ("C" average). Students who fall below this minimum at the end of a semester may continue to receive

benefits for the succeeding semester or summer term in a probationary status. Such probationary students who achieve a 2.00 GPR or higher during the probationary period but whose cumulative GRP is still below the required minimum may be allowed one additional probationary semester or summer term.

COUNSELING

Counseling services are available through the Office of Student Services. 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 request.

HEALTH SERVICES

Medical Clinic

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

Group Insurance

Since there are numerous health needs and costs which are not provided or paid for by the University's Health Service, students are encouraged to purchase medical insurance. A group plan is available to all students in The Texas A&M University System. Applications for this program will be distributed during new student orientation and are available from the Office of Student Services. 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, a physician and a medical assistant operate an on-board dispensary. All services provided on board are free of charge. Should a student require hospitalization ashore or evacuation, the student will be responsible for all costs incurred because of such hospitalization or evacuation.

HOUSING

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

Application for campus housing, which is separate from the application for admission to the University, is available from the Office of Student Services. This application, along with the \$100 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 is coordinated through the Office of Student Services 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, Graduate Student Association, Dormitory Association, Student Association of Maritime Administrators, Surfing Club and Karate Club.

Student Publications

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

Student Government

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

Athletics

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



CORPS OF CADETS

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

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

ADMISSION TO A LICENSE OPTION CURRICULUM

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

Among the criteria evaluated are:

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

These are summarized as follows:

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

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

All Cadets—Epilepsy, insanity and badly impaired hearing are disqualifying conditions.

Specific details of the required physical examinations are contained in the 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 result in denial of license by the U.S. Coast Guard. The University will not accept a candidate into a license option curriculum nor allow continued participation in the program when conduct infractions preclude license qualification.

4. Citizenship. Only United States citizens are eligible for officers' licenses in the U.S. Merchant Marine.

UNITED STATES COAST GUARD LICENSE AS A MERCHANT MARINE OFFICER

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

THE NAVAL RESERVE COMMISSION

The Maritime industry is considered a vital part of our national defense. The U.S. Navy provides active duty commissioned 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 three courses, Naval Science 200 and 300, which are required for all license option cadets. Naval Science 400, "Commissioning Preparation for the new Naval Ensign" is required for all seniors in the U.S. Maritime Service License Option Program.

In addition, the Department of Naval Science prepares eligible cadets for eventual commissioning in the Merchant Marine Reserve/United States Naval Reserve (MMR/USNR). Cadets under this program who pass a Navy physical examination 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 will be commissioned as a restricted line officer with the rank of Ensign in the MMR/USNR.

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

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

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

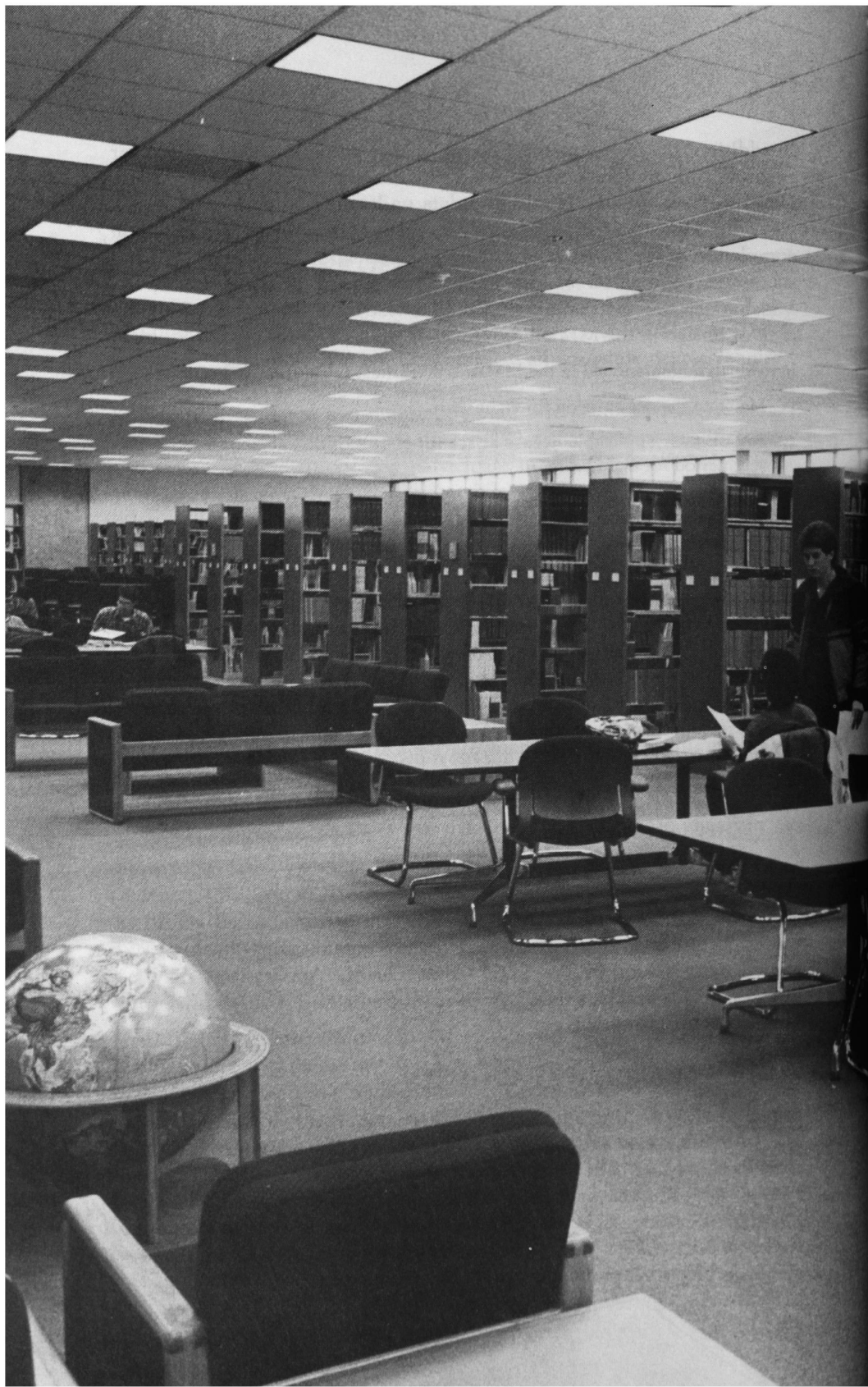
This program provides Merchant Marine Officers who are familiar with Naval procedures, to the merchant marine industry and provides the individual MMR/USNR officers, when on active duty, the benefits and pay normally provided U.S. Navy officers.

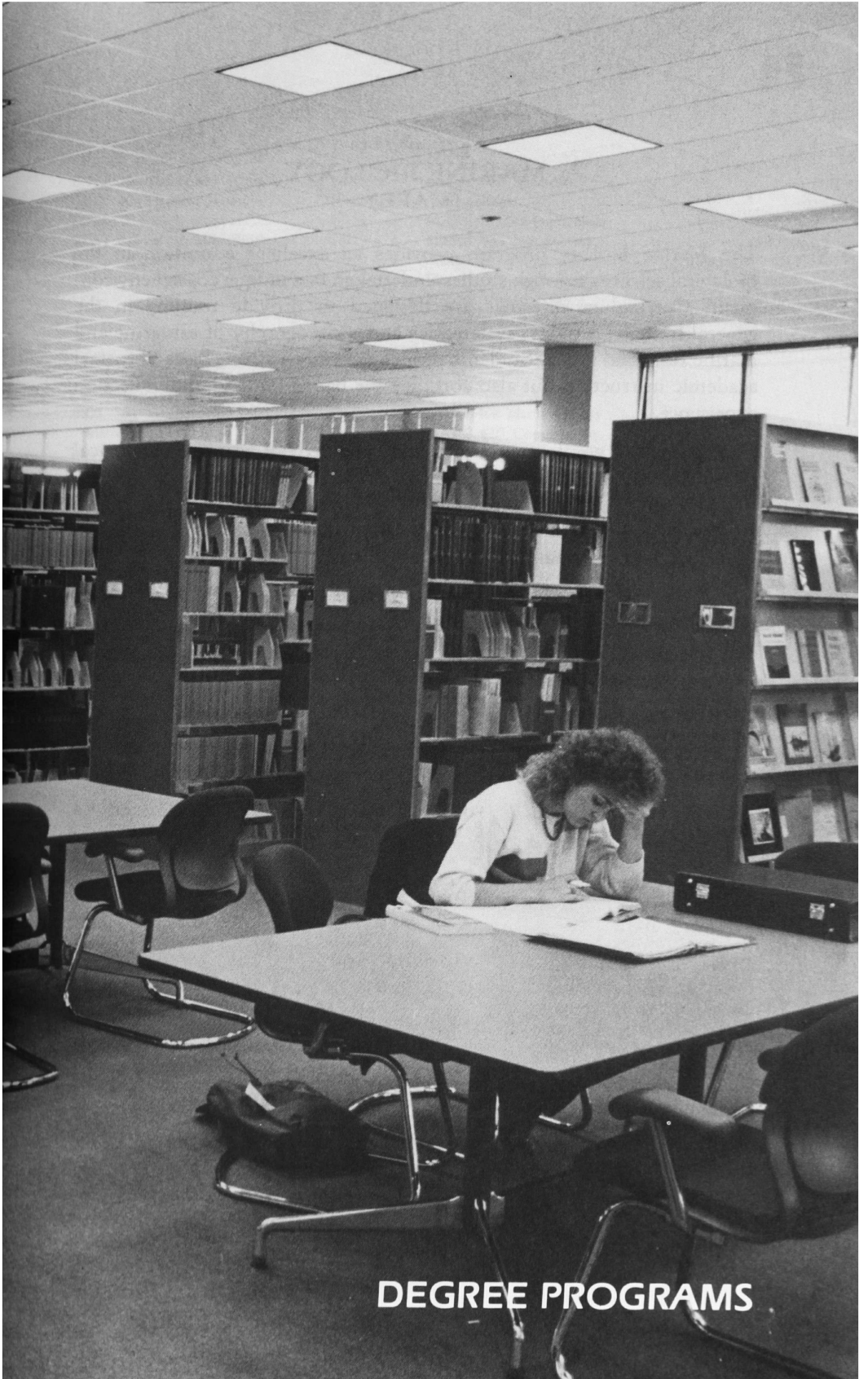
THE U.S. COAST GUARD COMMISSION

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

STUDENT INCENTIVE PAYMENTS

Students who enroll in a license option program for the first time during a fall semester may be eligible for Student Incentive Payments. In the past, these payments have come from both the Maritime Administration and private sources and have averaged \$100 per month. They are awarded to students based on competitive criteria that evaluate the student's potential for completing the degree program and license requirements and for a subsequent successful maritime career.





DEGREE PROGRAMS

Curriculum in
MARINE BIOLOGY
(MARB)

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

Graduates find employment with state and federal agencies, ecological consulting firms, industry, medical laboratories and educational institutions. Marine biology degree recipients have undertaken postgraduate 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 131 Mathematical Concepts— Calculus	(3-0)	3
Naval Science or Elective†		<u>1</u>	Naval Science or Elective†		<u>1</u>
		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 I	(0-3)	1	CHEM 238 Organic Chemistry Lab II	(0-3)	1
CPSC 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	POLS 207 State and Local Government	(3-0)	3
POLS 206 American National Government	(3-0)	3	Elective (General)†		2
Naval Science or Elective†		<u>1</u>	Naval Science or Elective†		<u>1</u>
		19			17

JUNIOR YEAR

ENGL 301 Technical Writing (3-0)	3	ECON 203 Principles of	
GEOL 104 Physical Geology (3-2)	4	Economics (3-0)	3
MARB 311 Ichthyology (2-3)	3	MARB 425 Marine Ecology (2-3)	3
STAT 302 Statistical Methods (2-2)	3	MARB 435 Invertebrate	
Elective (Biology)†	3	Zoology (3-3)	4
	<u>16</u>	Elective General†	3
		Elective (Social Science or	
		Humanities)†	3
			<u>16</u>

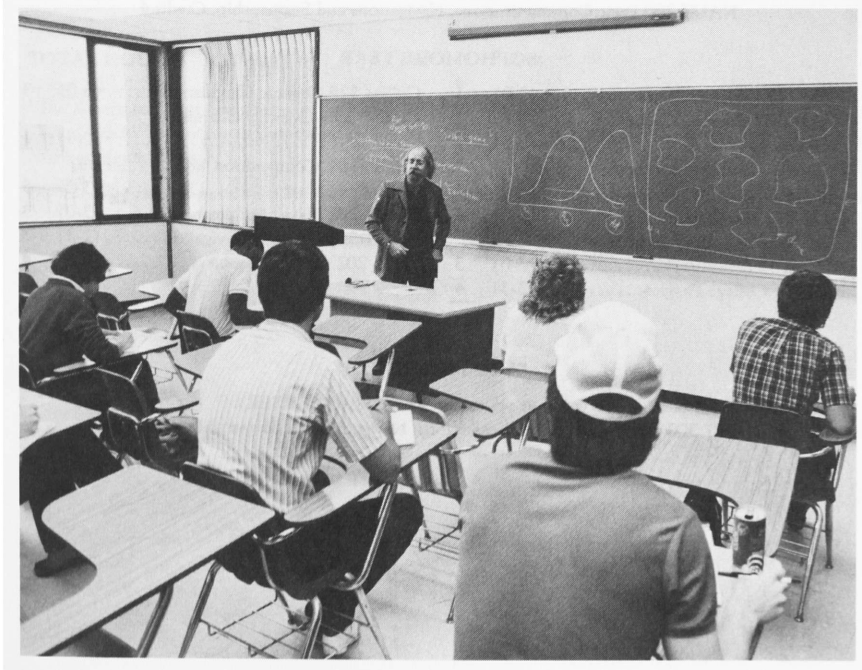
SENIOR YEAR

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

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 HIST 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 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 will be qualified to sit for the U.S. Coast Guard license examination as a Third Mate of any gross tonnage upon oceans, 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 Laboratory II	(0-3)	1
HIST 105 History of the U.S.*	(3-0)	3	MATH 131 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)	<u>3</u>	NAUT 204 Terrestrial Navigation	(2-2)	<u>3</u>
		17			17

SUMMER SESSION

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

SOPHOMORE YEAR

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

SUMMER SESSION

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

JUNIOR YEAR

CPSC 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..... (2-0)	2
MARB 302 Marine Cargo Operations I..... (3-3)	4	MART 406 Marine Cargo Operations II..... (3-2)	4
NVSC 300 Merchant Marine Officer II..... (3-0)	3	METR 302 Weather Reports and Forecasting..... (3-0)	3
	17	NAUT 301 Seamanship II..... (2-3)	3
		NAUT 304 Electronic Navigation (2-2)	3
			19

SUMMER SESSION

(Ten weeks at sea on the T/S TEXAS CLIPPER)

NAUT 400 Advanced Communications, Navigation and Seamanship, Credit 4

SENIOR YEAR

BIOL 351 Fundamentals of Microbiology..... (3-4)	4	HIST 106 History of the U.S. (3-0)	3
MARB 310 Introduction to Cell Biology..... (3-3)	4	MARB 420 Comparative Physiology..... (3-3)	4
NAUT 302 Seamanship III..... (1-3)	2	MARB 435 Invertebrate Zoology (3-3)	4
NAUT 404 The Navigator..... (2-3)	3	MARB 450 Developmental Biology of Marine Organisms..... (3-3)	
POLS 206 American National Government..... (3-0)	3	NVSC 400 Commissioning Preparation for the New Naval Ensign..... (0-2)	1
STAT 302 Statistical Methods..... (2-2)	3		
	19		16

TOTAL HOURS — 152

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

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

Curriculum in
MARINE ENGINEERING
(MARE)

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

The Marine Engineering program is available in a design-oriented non-license option and in an applications-oriented license option. The license option is open only to U.S. Maritime Service Cadets. Successful completion of the license option program will qualify the student to sit for the U.S. Coast Guard license examination. The license will enable him or her to serve as a Third Assistant Engineer on ocean-going steam and motor vessels of any gross tonnage .

Both options of the Marine Engineering program are accredited by the Accreditation Board for Engineering and Technology.

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 Fundamental of Chemistry Lab II	(0-3)	1
ENDG 105 Engineering Graphics	(0-6)	2	HIST 106 History of the U.S.*	(3-0)	3
ENGL 103 Composition and Rhetoric	(3-0)	3	MATH 152 Engineering Mathematics II.....	(3-2)	4
HIST 105 History of the U.S.*	(3-0)	3	NAUT 103E Maritime Orientation and Lifesaving	(2-3)	3
MARE 101 Engineering Analysis	(1-1)	1	PHYS 218 Mechanics	(3-3)	4
MATH 151 Engineering Mathematics I	(3-2)	<u>4</u>			<u>18</u>
		17			

SUMMER SESSION

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

SOPHOMORE YEAR

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

SUMMER SESSION

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

JUNIOR YEAR

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

SUMMER SESSION

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

SENIOR YEAR

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

TOTAL HOURS — NON-LICENSE OPTION 139

LICENSE OPTION 152

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

†NVSC 200, 300 and 400 must be taken by Maritime Service license option students for a total of seven (7) credit hours. Non-license students must take POLS 207 in their curriculum.

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 131 Mathematical Concepts— Calculus	(3-0)	3
Naval Science or Elective†		<u>1</u>	Naval Science or Elective†		<u>1</u>
		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 I	(0-3)	1	CHEM 238 Organic Chemistry Lab II	(0-3)	1
CPSC 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†		<u>1</u>	Naval Science or Elective†		<u>1</u>
		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
GEOG 104 Physical Geology (3-2)	4	POLS 207 State and Local Government (3-2)	3
MARB 311 Ichthyology (2-3)	3	Elective (Botany)†	4
POLS 206 American National Government (3-0)	3	Elective (Fisheries/Marine Biology)†	3
	<u>17</u>		<u>16</u>

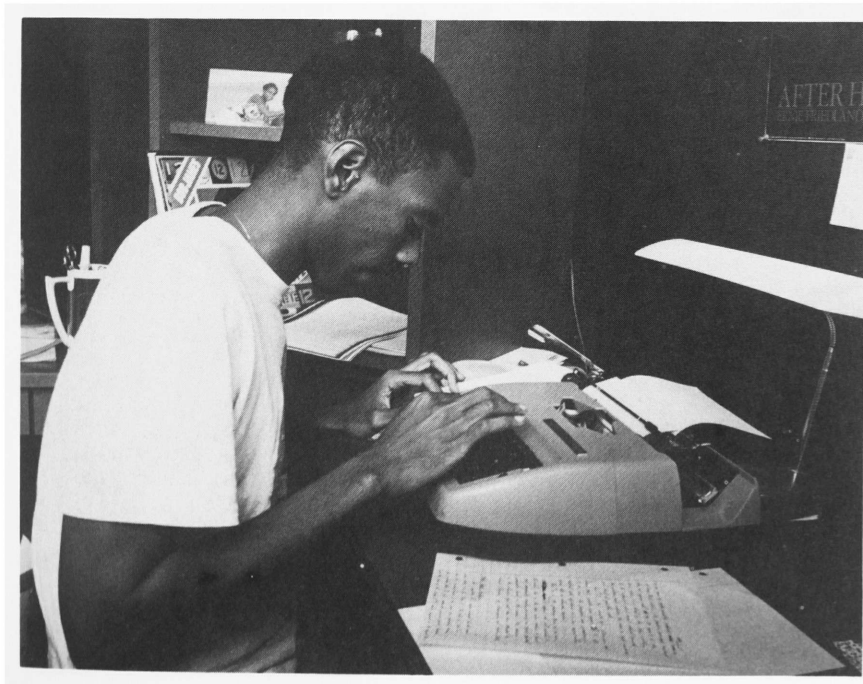
SENIOR YEAR

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
	<u>14</u>		<u>15</u>

TOTAL HOURS — 135

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

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



Curriculum in
MARINE SCIENCES
(MARS)

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

FRESHMAN YEAR

Fall Semester	(Th-Pr)	Cr	Spring Semester	(Th-Pr)	Cr
BIOL 113 Introductory Biology	(3-0)	3	BIOL 114 Introductory Biology	(3-0)	3
BIOL 123 Introductory Biology Lab	(0-3)	1	BIOL 124 Introductory Biology Lab	(0-3)	1
CHEM 101 Fundamentals of Chemistry I	(3-0)	3	CHEM 102 Fundamentals of Chemistry II	(3-0)	3
CHEM 111 Fundamentals of Chemistry Laboratory I	(0-3)	1	CHEM 112 Fundamentals of Chemistry Laboratory 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*		<u>1</u>	Naval Science or Elective*		<u>1</u>
		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 I	(0-3)	1	CHEM 238 Organic Chemistry Lab II	(0-3)	1
GEOL 104 Physical Geology	(3-2)	4	CPSC 203 Introduction to Computing	(3-0)	3
MATH 253 Engineering Mathematics III	(3-2)	4	OCNG 401 Introduction to Oceanography	(3-0)	3
PHYS 218 Mechanics	(3-3)	4	PHYS 219 Electricity	(3-3)	4
Naval Science or Elective*		<u>1</u>	POLS 207 State and Local Government	(3-0)	3
		17	Naval Science or Elective		<u>1</u>
					18

JUNIOR YEAR

ECON 203 Principles of Economics ...	(3-0)	3	Computer Science Elective*	(3-0)	3
ENGL 301 Technical Writing	(3-0)	3	MARB 440 Marine Biology	(3-3)	4
GEOG 210 Marine Geography	(3-0)	3	MARS 310 Field Methods	(1-6)	3
STAT 302 Statistical Methods	(2-2)	3	HIST 106 History of the U.S.†	(3-0)	3
HIST 105 History of the U.S.†	(3-0)	3	Electives*		<u>3</u>
Elective*		<u>3</u>			18
		18			

SENIOR YEAR

MARS 481 Seminar in Marine Sciences..... (1-0)	1	MARS 450 Electrical and Physical Measurements..... (2-3)	3
MASE 375 Science of Fluids..... (3-0)	3	MARS 485 Problems in Marine Sciences..... (3-0)	3
MARS Options‡..... (3-0)	3	MARS Options‡..... (3-0)	3
METR 302 Weather Reports and Forecasting..... (3-0)	3	Electives*.....	<u>6</u>
POLS 206 American National Government..... (3-0)	3		15
Electives*.....	<u>6</u>		
	19		

TOTAL HOURS — 135

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

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

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



Curriculum in
MARINE SCIENCES WITH A LICENSE OPTION

This program retains the basic physical science core of the Marine Sciences program but leads as well toward a U.S. Coast Guard license. This option is available to U.S. Maritime Service cadets in the Marine Sciences program. The student who successfully completes the license program will be qualified to sit for the U.S. Coast Guard examination as a Third Mate of any gross tonnage upon oceans, 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)	<u>3</u>	NAUT 204 Terrestrial Navigation	(2-2)	<u>3</u>
		17			17

SUMMER SESSION

(Ten weeks at sea on the T/S TEXAS CLIPPER)
NAUT 200 Basic Communications, Navigation and 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	CPSC 203 Introduction to Computing	(3-0)	3
NAUT 201 Naval Architecture I	(3-2)	4	NAUT 202 Naval Architecture II	(3-0)	3
NVSC 200 Merchant Marine Officer I	(3-0)	3	NAUT 303 Celestial Navigation	(2-3)	3
PHYS 218 Mechanics	(3-3)	<u>4</u>	PHYS 219 Electricity	(3-3)	<u>4</u>
		19			17

SUMMER SESSION

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

JUNIOR YEAR

ENGL 301 Technical Writing (3-0)	3	MART 321 Maritime Law I (2-0)	2
GEOL 104 Physical Geology (3-2)	4	NAUT 301 Seamanship II (2-3)	3
MART 302 Maritime Cargo Operations I (3-3)	4	NAUT 304 Electronic Navigation (2-2)	3
POLS 206 American National Government (3-0)	3	NVSC 300 Merchant Marine Officer II (3-0)	3
STAT 302 Statistical Methods (2-2)	3	OCNG 401 Introduction to Oceanography (3-0)	3
	17		14

SUMMER SESSION

(Ten weeks at sea on the T/S TEXAS CLIPPER)

NAUT 400 Advanced Communications, Navigation and Seamanship, Credit 4
MARS 485 Problems in Marine Sciences, Credit 3

SENIOR YEAR

MARS 481 Seminar in Marine Sciences (1-0)	1	HIST 106 History of the U.S.* (3-0)	3
MART 406 Maritime Cargo Operations II (3-2)	2	MARB 440 Marine Biology (3-3)	4
NAUT 302 Seamanship III (1-3)	2	MARS 310 Field Methods in Marine Sciences (1-6)	3
NAUT 404 The Navigator (2-3)	3	METR 302 Weather Reports and Forecasting (3-0)	3
MARS Options† (3-0)	3	MARS Options† (3-0)	3
Elective‡	3		16
NVSC 400 Commissioning Preparation for the New Naval Ensign (0-2)	1		
	17		

TOTAL HOURS — 149

*The American history requirement may be fulfilled by taking other American history courses offered at Texas A&M University at Galveston, including HIST 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.

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

Curriculum in
MARINE TRANSPORTATION
(MART)

This program combines studies in the humanities and sciences with instruction and training in maritime disciplines to provide the U.S. Maritime Service cadet with a broad-based education. The student who successfully completes the license program will be qualified to sit for the U.S. Coast Guard license examination as a Third Mate of any gross tonnage upon oceans, 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
ENDG 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)	<u>3</u>
NAUT 103 Maritime Orientation and Lifesaving	(2-3)	<u>3</u>			16
		16			

SUMMER SESSION

(Ten weeks at sea on the T/S TEXAS CLIPPER)
NAUT 200 Basic Communications, Navigation and 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
METR 302 Weather Reports and Forecasting	(3-0)	3	NVSC 200 Merchant Marine Officer I	(3-0)	3
PHYS 201 College Physics	(3-3)	<u>4</u>	PHYS 202 College Physics	(3-3)	<u>4</u>
		17			16

SUMMER SESSION

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

JUNIOR YEAR

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

SUMMER SESSION

(Ten weeks at sea on the T/S TEXAS CLIPPER)

NAUT 400 Advanced Communications, Navigation and Seamanship, Credit 4

SENIOR YEAR

MART 421 Maritime Law II (3-0)	3	STAT 302 Statistical Methods (3-0)	3
NAUT 302 Seamanship III (1-3)	2	ENGL 301 Technical Writing (3-0)	3
NAUT 404 The Navigator (2-3)	3	MART 416 Port Operations Administration and Economics (3-0)	3
POLS 206 American National Government (3-0)	3	MART 481 Seminar (0-2)	1
Elective†	3	OCNG 401 Introduction to Oceanography (3-0)	3
NVSC 400 Commissioning Preparation for the New Naval Ensign (0-2)	1	Elective†	3
	<u>15</u>		<u>16</u>

TOTAL HOURS — 144

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

†Electives must be chosen after consultation with, and approval by, the student's academic advisor.



Curriculum in
MARITIME ADMINISTRATION
(MARA)

This curriculum 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	CPSC 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 131 Mathematical Concepts—Calculus	(3-0)	3
Science†		3	Science†		4
Naval Science or Elective‡		<u>1</u>	Naval Science or Elective‡		<u>1</u>
		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	(4-0)	4	MARA 212 Business Law	(3-0)	3
NAUT 201 Naval Architecture I	(3-2)	4	MART 304 Ocean Transportation II	(3-0)	3
POLS 206 American National Government	(3-0)	3	POLS 207 State and Local Government	(3-0)	3
Naval Science or Elective‡		<u>1</u>	Naval Science or Elective‡		<u>1</u>
		18			16

JUNIOR YEAR

BANA 303 Statistical Methods	(3-0)	3	BANA 364 Operations Management	(3-0)	3
ECON 311 Money and Banking	(3-0)	3	ENGL 301 Technical Writing	(3-0)	3
MARA 363 The Management Process	(3-0)	3	FINC 341 Business Finance	(3-0)	3
MART 421 Maritime Law II	(3-0)	3	MARA 401 Brokerage and Chartering	(3-0)	3
MKTG 321 Marketing	(3-0)	3	POLS 340 Introduction to Public Administration	(3-0)	3
Elective‡		<u>3</u>	Elective‡		<u>3</u>
		18			18

SENIOR YEAR

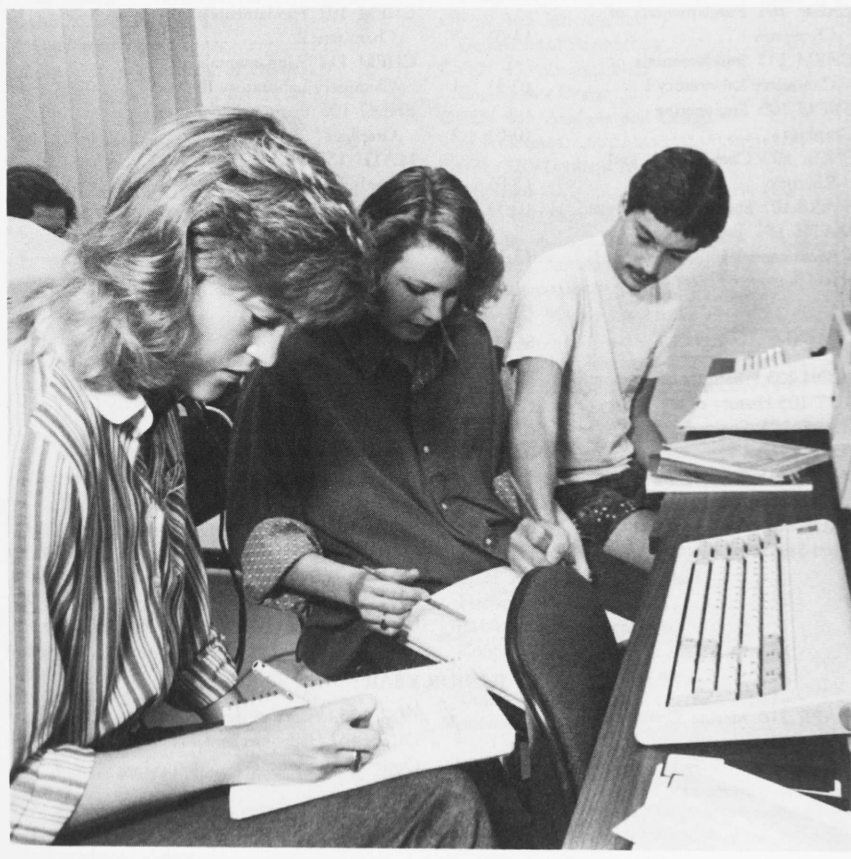
ACCT 327 Intermediate Accounting (3-0)	3	BANA 424 Economics of Transportation (3-0)	3
BANA 459 Analytical Models for Business Decisions (3-0)	3	ECON 412 Public Finance..... (3-0)	3
ECON 452 International Trade and Finance (3-0)	3	MARA 435 Labor Law and Policy.... (3-0)	3
MARA 402 Inland Waterways (3-0)	3	MARA 466 Management Policy..... (3-0)	3
MARA 373 Personnel Management... (3-0)	3	MART 416 Port Operations, Administration and Economics..... (3-0)	<u>3</u>
MARA 460 Management Systems and Control (3-0)	<u>3</u>		15
	18		

TOTAL HOURS — 136

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

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

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



Curriculum in
MARITIME SYSTEMS ENGINEERING
(MASE)

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

FRESHMAN YEAR

Fall Semester	(Th-Pr)	Cr	Spring Semester	(Th-Pr)	Cr
CHEM 101 Fundamentals of Chemistry I	(3-0)	3	CHEM 102 Fundamentals of Chemistry II.....	(3-0)	3
CHEM 111 Fundamentals of Chemistry Laboratory I	(0-3)	1	CHEM 112 Fundamentals of Chemistry Laboratory II	(0-3)	1
ENDG 105 Engineering Graphics	(0-6)	2	ENDG 106 Engineering Design Graphics	(0-6)	2
ENGL 103 Composition and Rhetoric	(3-0)	3	MATH 152 Engineering Mathematics II.....	(3-2)	4
MARE 101 Engineering Analysis	(0-3)	1	MASE 100 Introduction to Maritime Systems Engineering	(2-3)	3
MATH 151 Engineering Mathematics I	(3-2)	4	PHYS 218 Mechanics.....	(3-3)	4
Naval Science or Elective*		<u>1</u>	Naval Science or Elective*		<u>1</u>
		15			18

SOPHOMORE YEAR

ECON 203 Principles of Economics ..	(3-0)	3	ENGL 203 Introduction to Literature	(3-0)	3
HIST 105 History of the U.S.†	(3-0)	3	MARE 206 Engineering Mechanics II	(3-0)	3
MARE 105 Engineering Mechanics I	(3-0)	3	MARE 209 Mechanics of Materials	(3-0)	3
MATH 253 Engineering Mathematics III	(3-2)	4	MARE 303 Thermodynamics I.....	(3-0)	3
NAUT 201 Naval Architecture I	(3-2)	4	MARE 310 Engineering Computations	(3-0)	3
Naval Science or Elective*		<u>1</u>	MATH 308 Differential Equations....	(3-0)	3
		18	Naval Science or Elective*		<u>1</u>
					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	OCEN 462 Hydromechanics.....	(3-0)	3
Option Requirements‡.....		<u>10</u>	Option Requirements‡		<u>12</u>
		18			18

SENIOR YEAR

ENGL 301 Technical Writing (3-0)	3	OCEN 401 Measurements in the Ocean (3-0)	3
OCEN 300 Dynamics of Waves and Structure I (3-0)	3	OCEN 410 Measurements in the Ocean Lab (0-3)	1
POLS 206 American National Government (3-0)	3	POLS 207 State and Local Government (3-0)	3
Option Requirements‡	6	Option Requirements‡	9
	<u>15</u>		<u>9</u>
TOTAL HOURS — 137			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

CVEN 311 Fluid Dynamics (3-0)	3
CVEN 345 Theory of Structures (0-3)	3
CVEN 365 Introduction to Geotechnical Engineering (2-2)	3
GEOL 320 Geology for Civil Engineering (2-2)	3
MARE 207 Electricity and Magnetism (3-2)	4
MARS 410 Introduction to Physical Oceanography (3-0)	3
MARS 430 Geological Processes in Marine Environment (3-0)	3
MASE 461 Electronic Instrumentation (2-3)	3
OCEN 400 Basic Coastal Engineering (3-0)	3
Life Science Elective	3
Elective (Social Sciences)*	3
Elective (Technical)*	3
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COASTAL STRUCTURES
OPTION REQUIREMENTS

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

CVEN 311 Fluid Dynamics (3-0)	3	MASE 415 Marine Structures Design (3-0)	3
CVEN 336 Fluid Dynamics Lab (0-2)	1	MASE 461 Electronic Instrumentation (2-3)	3
MARE 301 Heat Transfer (3-0)	3	MATH 311 Topics in Applied Mathematics I (3-0)	3
MARE 207 Electricity and Magnetism (3-2)	4	MEMA 460 Introduction to Continuum Mechanics (3-0)	3
MARS 410 Introduction to Physical Oceanography (3-0)	3	OCNG 401 Introduction to Oceanography (3-0)	3
MASE 411 Advanced Hydrodynamics I (3-0)	3	Electives*	2
MASE 412 Advanced Hydrodynamics II (3-0)	3		
			<u>37</u>

*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 HIST 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.
- 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.
- 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 MARB department head.

BUSINESS ANALYSIS (BANA)

- 303. Statistical Method (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 131.
- 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: BANA 217 or CPSC 203 or MARA 301 and BANA 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.

- 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: Senior classification or approval of MARA department head.
- 485. Problems. Credit 1 to 4 each semester.** Directed study of selected problems in an area of business analysis not covered in other courses. Prerequisite: Approval of MARA department head.

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.
- 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 MARS department head.

CIVIL ENGINEERING (CVEN)

- 311. Fluid Dynamics. (3-0). Credit 3.** Fluid properties; statics; kinematics; basic conservation principles of continuity, energy and momentum; similitude and hydraulic models; incompressible flow in pipes; fluid dynamic drag. Prerequisite: MARE 206 or equivalent.
- 336. Fluid Dynamics Laboratory. (0-2). Credit 1.** Introduction to laboratory techniques, calibration principles, reports and fluid measurements. Determination of fluid properties. Visualization of types of flow. Experiments in closed conduit flow of air, water and oil. Fluid drag and tubomachinery tests. Open channel and gravity wave demonstrations. Prerequisite: CVEN 311 or registration therein.
- 344. Reinforced Concrete Structures. (2-3). Credit 3.** Analysis and design of reinforced concrete beams, columns, slabs and footings using ultimate strength methods. Prerequisite: CVEN 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: CVEN 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: CVEN 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 earth 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: CVEN 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: CVEN 344, 346, 365.

COMPUTER SCIENCE (CPSC)

- 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.
- 412. Public Finance. (3-0). Credit 3.** Economic role of governments; the choice of public sector output in a democracy and the effects of various taxes on resource allocation and income distribution. Prerequisite: ECON 204.
- 452. 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 311 or approval of MARA department head. Formerly ECON 321.
- 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: Major or minor in MARA or Economics (TAMU) or approval of MARA department head.

ENGINEERING DESIGN GRAPHICS (ENDG)

- 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: ENDG 105.

485. Problems. Credit 1 to 3 each semester. Special problems to fit needs of individual students. Prerequisite: Approval of instructor.

ENGLISH (ENGL)

103. Composition and Rhetoric. (3-0). Credit 3. Composition of short papers, with emphasis on sentence structure, paragraph development and paper organization. Analysis of expository prose.

104. Composition and Rhetoric. (3-0). Credit 3. Continuation of ENGL 103. More complex methods of paper development; investigative papers. Readings in prose. Prerequisite: 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 and composition for specific needs and interests 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 (FINC)

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.

GENETICS (GENE)

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: GENE 301 or 310 and approval of instructor or department head.

GEOGRAPHY (GEOG)

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.

- 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. (3-3). Credit 4.** General principles of physical geology; structure of the earth, origin of minerals and rocks and geologic processes; synthesis of geologic ideas and introduction to geologic practice. This course does not involve rigorous mathematical or chemical treatment of the subjects but may be used for fulfillment of laboratory science requirements.
- 104. Physical Geology. (3-3). Credit 4.** Earth materials, structures, external and internal characteristics; physical processes at work upon or within the planet. A working knowledge of high school chemistry and mathematics is required.
- 106. Historical Geology. (3-3). 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 approval of instructor.
- 203. Crystallography and Mineralogy. (2-6). Credit 4.** Crystallography and descriptive mineralogy. Sight recognition of crystal forms and of common minerals. Prerequisite: CHEM 102 or 104. MATH 121 or 151.
- 305. Invertebrate Palaeontology (2-3). Credit 3.** Analysis of the history of life and the processes that have controlled it. Application of Palaeontology to geologic problems. Field trips may be required. Prerequisite: Approval of Instructor.
- 320. Geology for Civil Engineers. (2-3). 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.

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.

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.

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.

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. Prerequisite: MGMT 363, MKTG 321, BANA 303, FINC 341 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.

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: BIOL 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. Prerequisite: MARB 315 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. Marine Botany. (3-3). Credit 4.** Morphology, systematics, ecology and biochemistry of representative algae, fungi, and submarine grasses. Prerequisites: BIOL 114 and 124 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.
- 412. Sociobiology of Reproduction. (3-0). Credit 3.** Application of sociobiological concepts to examine the evolution and adaptive significance of reproductive strategies utilized by marine and terrestrial animals. Strategy-influencing factors to be discussed include: Mate selection and competition, sex roles, bonding, parental investment in offspring, and socialization. Prerequisites: Biology 113 and 114 and MARB 301 or equivalent, or or registration therein. (new course, Approval pending Coordinating Board, Texas C&U System).
- 418. Fisheries Population Dynamics. (2-2). Credit 3.** Recruitment, growth, natural mortality and exploitation of populations; implications to management of commercial fisheries. Prerequisite: STAT 302; MATH 131; 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. Prerequisite: Junior classification.

- 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. Prerequisite: BIOL 113 and 114 or approval of instructor.
- 435. Invertebrate Zoology. (3-3). Credit 4.** General biology of marine invertebrate animals; morphology, evolution and systematics. Laboratory will stress the studies of local fauna. Prerequisites: BIOL 114 and 124 and Junior classification in Marine Biology, or approval of instructor.
- 440. Marine Biology. (3-3). Credit 4.** Introduction to biology of common organisms inhabiting bays, beaches and near-shore oceanic waters, with special reference to Gulf of Mexico biota. Lectures, laboratory studies and field trips will emphasize classification and economic aspects of marine organisms. A survey course, not intended for use in the Marine Biology curricula. Prerequisites: BIOL 113, 114, 123, 124 or equivalent; approval of instructor.
- 450. Developmental Biology of Marine Organisms. (3-3). Credit 4.** Principles of developmental biology and descriptive and analytical embryology of selected marine invertebrates and fishes. Prerequisite: MARB 435 or BIOL 435.
- 481. Seminar in Marine Biology. (1-0). Credit 1.** Problem-oriented discussion session with topics and reports selected for current relevance in marine biology. May be repeated once only for credit. Prerequisite: Approval of department head.
- 485. Problems in Marine Biology. Credit 1 to 6 per semester.** Special topics and problems suited to analysis by individuals or small groups concerning aspects of marine biology. Prerequisite: Approval of department head.
- 489. Special Topics in . . . Credit 1 to 4.** Selected topics in identified areas of marine biology. Prerequisite: Approval of instructor.

MARINE ENGINEERING (MARE)

- 101. Engineering Analysis. (1-1). Credit 1.** Introduction to FORTRAN, fundamental programming and program structure and data representation. Introduction to computer solutions of numerical problems.
- 105. Engineering Mechanics I. (3-0). Credit 3.** Statics, basic vector operations, mechanics of particles and rigid bodies. Center of gravity, analysis of structures, friction, moments of inertia. Prerequisite: MATH 151.
- 180. Basic Machine Shop Techniques. (0-3). Credit 1.** Safety, care of machines and hand-tools, cutting speeds and feeds, measuring instruments, gaging, standard machine tool work in metals, layouts, drilling, tapping, threading, vertical and horizontal milling and shaving.
- 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.

- 203. Diesel Engine Technology. (2-2). Credit 3.** Basic principles of two and four-stroke diesel engines; intake, scavenging and exhaust systems, injection systems; starting and reversing methods; cooling and lubricating systems; engine room layout in modern motor vessels.
- 206. Engineering Mechanics II. (3-0). Credit 3.** Dynamics; scalar and vector solutions of relative linear velocities and acceleration; kinetics; dynamics of translation and rotation; work; energy; impact; momentum. Prerequisite: MARE 105.
- 207. Electricity and Magnetism. (3-2). Credit 4.** Introduction to basic electricity, electric and magnetic circuits studied under DC and AC steady-state condition. Complex numbers, phasor algebra, complex impedance and three-phase circuits introduced. Laboratory includes measurement of circuit phenomena. Prerequisites: MATH 253; PHYS 219 or concurrent registration.
- 209. Mechanics of Materials. (3-0). Credit 3.** Introduction to the study of stresses, strains and deformation of a solid body which results when static forces are applied. Transformation of stresses and strains, torsion, beam deflection and combined loadings are discussed. Prerequisite: MARE 105.
- 210. Marine Construction Materials. (3-2). Credit 4.** Introduction to materials science; study of the properties of materials as related to marine engineering design and applications. Laboratory includes experimental evaluation of structural properties and heat treatment techniques. Prerequisite: MARE 209.
- 280. Welding Techniques. (0-3). Credit 1.** To introduce students to the materials, equipment and techniques of welding and brazing and to develop skills required by the Marine Engineer for this work in the engine room of commercial ships.
- 300. Intermediate Operations. Credit 4.** Training program for second sea-training period. Sea projects required of each student under supervision of officer-instructors. Lifeboat and safety training.
- 301. Heat Transfer. (3-2). Credit 4.** Conduction, convection and radiation and their effects separately and in combination with one another. Steady and unsteady states, mathematical treatments, graphical and numerical solutions, dimensional analysis. Introduction to laboratory techniques involving heat transfer experiments. Prerequisites: MATH 308; MARE 344 or CVEN 311 (concurrent registration).
- 303. Marine Thermodynamics I. (3-0). Credit 3.** Energy concepts. First and second law of thermodynamics. Carnot and Rankine principles and reversible heat cycles. Properties and processes of vapors, vapor-power cycles and vapor refrigeration cycles. Prerequisite: MATH 152.
- 304. Marine Thermodynamics II. (3-0). Credit 3.** Properties and processes of perfect gases, gas compression cycles, gas power cycles, air refrigeration cycles and processes involving mixture of gases and vapors. Prerequisite: MARE 303.
- 307. Electrical Circuits. (3-2). Credit 4.** Steady-state and transient response studied by classical methods and by behavior of the impedance function. Principles of electronics, elementary amplifiers, transistors and solid state electronics are introduced. Prerequisites: MARE 207; MATH 308.

- 308. Electrical Machinery. (3-2). Credit 4.** Principal types of direct-current and alternating-current electrical machines, including their characteristics, application, and central device. Operation and testing of electrical machinery and transformers. Prerequisite: MARE 207.
- 310. Engineering Computation. (3-0). Credit 3.** Techniques of problem solving using digital computers; concepts and properties of algorithms; solution of computational problems using algorithms defined by FORTRAN. Flow diagrams and program preparation. Prerequisites: MATH 152; MARE 101.
- 344. Fluid Mechanics. (3-0). Credit 3.** Application of laws of statics, buoyancy, stability, energy and momentum to behavior of ideal and real fluids. Dimensional analysis and similitude and their application to flow through ducts and piping. Dynamic lift and related problems. Prerequisite: MARE 206.
- 400. Advanced Operations. Credit 4.** Training program for third sea-training period. At end of this period each student will have achieved the knowledge and will have demonstrated the ability to take complete charge of a modern marine power plant while underway at sea.
- 403. Marine Engineering Measurements Laboratory I. (1-2). Credit 2.** Basic techniques and instrumentation for performing engineering measurements as applied to solid mechanics, fluid mechanics, thermodynamics, stress analysis and vibrations. Prerequisites: MARE 209; MARE 303; CVEN 311.
- 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. Prerequisites: MARE 301, 304; MEEN 344 or CVEN 311.
- 411. Marine Machine Design. (3-0). Credit 3.** Analysis of the design and application of components in marine mechanical systems. Prerequisites: MARE 206, 209.
- 412. Ship Structures and Stability. (3-0). Credit 3.** Introduction to the naval architecture involved in ship design. Geometry of the ship, evaluation of stability, motions in waves and a study of ships' structures. Prerequisite: MARE 209; CVEN 311 or registration therein.
- 414. Ship Automation. (3-2). Credit 4.** Linear servomechanism theory including transformation mathematics (Laplace transformation), the transfer function feedback, stability analysis and graphical techniques. Introduction to laboratory techniques involving open and closed loop concepts, negative and positive feedback concepts, and position and velocity outputs. Prerequisite: MARE 307.
- 415. Economics of Marine Engineering Systems Design. (3-0). Credit 3.** Application of systems engineering techniques in the solution of marine engineering problems regarding reliability, economic and environmental considerations. Prerequisite: MARE 410 (concurrent registration).
- 416. Engineering Laboratory II. (0-4). Credit 1.** Analysis of fundamentals of machinery dynamics, heat transfer, fluid friction losses in piping systems, steam nozzles. Steam reciprocating and diesel engines. Prerequisite: Senior classification.

- 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 technique and reliability. A marine related design project is required, including oral and written reports. Prerequisite: Senior classification or approval of department head.
- 421. Advanced Engineering Computation. (3-0). Credit 3.** Techniques for the solution of engineering problems using existing computer software such as ANSYS. Problems in structural dynamics, heat transfer and hydromechanics, with emphasis on the solution of static stress analysis problems. Prerequisite: MARE 310.
- 459. Mechanical Vibrations. (3-0). Credit 3.** Basic theory of vibrating systems with single and multiple degrees of freedom and principles of transmission and isolation of vibrations. Prerequisite: MARE 206.
- 471. Ethics in Management and Engineering. (3-0). Credit 3.** Ethical considerations and value judgements related to management and engineering decisions. Topics will include ethics, environmental impact considerations, user health and safety responsibilities and obligations of managers and engineers to society, supervisory duties, and responsibilities. Course work will include case studies and lectures by visiting managers, engineers and lawyers. Prerequisite: Senior standing.
- 485. Problems. Credit 1 to 4 each semester.** Special problems in marine engineering not covered by any other course in the curriculum. Work may be in either theory or laboratory. Prerequisite: Approval of department head.
- 489. Special Topics. Credit 1-4.** Selected topics in identified areas of marine engineering. Prerequisite: Senior classification or approval of department head.

MARINE FISHERIES (MARF)

- 201. Fisheries Conservation and Management. (3-0). Credit 3.** Introduction to fisheries resources of the United States with special reference to the Gulf of Mexico. Review of historical and current fishery management education and research.
- 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 vertebrate zoology.
- 423. Mariculture. (3-3). Credit 4.** 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 an identified area of marine fisheries science. 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.
- 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. Prerequisite: GEOL 245, 303 or approval of department head.
- 310. Field Methods in Marine Sciences. (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 maps and remotely sensed imagery will be introduced. Prerequisite: 15 hours of marine sciences or the equivalent.
- 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 micro-computers and "Basic" as a programming language; algorithms, storage, conditional clauses, arrays matrices, functions, character strings, routines and subroutines, word processing, spread sheets and data bases.
- 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.
- 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: CHEM 101 and 102, CHEM 111 and 112, MATH 131 or 151.

- 405. Waterborne Transportation of Hazardous Chemicals. (3-0). Credit 3.** Basic concepts associated with the transportation of hazardous chemicals 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 elements of the physics of the ocean; descriptive aspects and theoretical explanations of circulation, characteristic structure, and waves. Prerequisites: MATH 253 or equivalent; PHYS 219 or equivalent, or approval of instructor.
- 420. Introduction to Chemical Oceanography. (3-0). Credit 3.** Introduction to chemical processes in the marine environment. Composition of sea salt, chemical speciation of dissolved material in the ocean. Biogeochemistry of oxygen, major elements, nutrient elements and some trace metals in the surface and deep ocean. Formation, chemical composition and alterations of detrital material and marine sediments. Simple models which relate ocean chemistry to the circulation of identifiable masses of water. Radioisotopes and stable isotopes in chemical oceanography. Prerequisite: CHEM 102.
- 430. Introduction to Geological Oceanography. (3-0). Credit 3.** Introduction to geological processes in the marine system: Physiographic provinces, origin and evolution of basins, shelves, slopes, and beaches. Geological sampling and geophysical methods; coastal beach and estuarine processes. Prerequisite: 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: PHYS 202, GEOL 101 or 104, MATH 151 or approval of instructor.
- 450. Electrical and Physical Measurements. (2-3). Credit 3.** Study of basic instrumentation pertinent to Marine Sciences and Biology as well as simple circuit design and digital electronics. Laboratory emphasizes spectroscopy, environmental measurements, and basic oceanographic measurements. Prerequisites: CHEM 102, PHYS 202, MATH 131 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. (2-0). Credit 2.** 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. (3-2). Credit 4.** 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; 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 in COBOL and utilize existing programs to solve business related programs.
- 363. The Management 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.
- 373. Personnel Management. (3-0). Credit 3.** Relationship of the personnel function to the whole organization; manpower planning; recruitment; selection, including employment application; separation; compensation; training; performance appraisal; labor relations and safety. Prerequisites: MARA 363 or approval of MARA department head.
- 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.
- 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.

- 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; and special-purpose planning and control systems. Prerequisites: MARA 363 or BANA 364 or CPSC 203 or MARA 301 or approval of department head.
- 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, MKTG 321, BANA 303, FINC 341 and senior classification.
- 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 MARA department head.
- 485. Problems. Credit 1 to 3 each semester.** Directed study on selected problems in the area of Maritime Administration not covered in other courses. Prerequisite: Approval of MARA department head.

MARITIME SYSTEMS ENGINEERING (MASE)

- 100. Introduction to Maritime Systems Engineering. (2-3). Credit 3.** Activities and career opportunities in the ocean and maritime industries; lectures, seminars and field trips; outside speakers and industry contact. Desalination, ocean mining, fish farming, pollution, pipelines, submersibles and habitats, fixed and floating platforms, high-speed marine transportation.
- 375. Science of Fluids. (3-0). Credit 3.** Classical fluid mechanics; fundamental physical principles. Fluid statics, principles of fluid motion, frictionless flow, surface waves, viscous flows, turbulence, molecular basis of fluid mechanics. Prerequisite: MATH 253.
- 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 for 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. Prerequisite: OCEN 300 or registration therein.
- 410. Measurements in the Ocean Laboratory. (0-3). Credit 1.** Laboratory and field techniques for measuring engineering parameters in the ocean environment. Prerequisite: OCEN 300, MASE 401 or registration therein.

- 411. Advanced Hydrodynamics I. (3-0). Credit 3.** Hydrodynamics of ship design, semisubmersible platforms, underwater pipelines, hydrofoils, etc. Studies are made of principal types of flow, flow of ideal and real liquids around flat and curved surfaces, separation, eddying, and cavitation. Additional studies are made of flow around discontinuities in a surface, wave making, flow of a liquid around a hydrofoil, production of thrust in a liquid and interaction of hull, appendages and propulsion devices. Prerequisite: OCEN 462.
- 412. Advanced Hydrodynamics II. (3-0). Credit 3.** This is a continuation of MASE 411. A presentation of additional techniques and current data available for the practical applications of hydrodynamics to industry design problems. Subject matter includes potential flow patterns and velocity and pressure diagrams around various bodies, source-sink flow diagrams, data on separation, eddying, and vortex motion, inception and effect of cavitation on propellers, data on ship waves and calculation of appendage resistance. Prerequisite: MASE 411.
- 415. Marine Structures Design. (3-0). Credit 3.** Forcing function of surface waves and currents. Dynamics of marine structure, deterministic and probabilistic approaches to fixed structure design, design project—dynamic analysis of a fixed offshore structure from a given design wave. Prerequisite: OCEN 300.
- 461. Electronic Instrumentation. (2-3). Credit 3.** For non-electrical engineering majors. Applications of electronic instruments to research problems in field of measurements and control systems. Prerequisite: 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 with emphasis on economic and social aspects. Prerequisite: ECON 204 or approval of MARA department head.

MATHEMATICS (MATH)

- 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.

- 131. 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.
- 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.
- 253. Engineering Mathematics III. (3-2). Credit 4.** Elementary vector algebra, infinite series, power series, Taylor series, and indeterminate forms. Calculus of functions of several variables, spatial derivatives, directional derivatives, gradient, multiple integration applications. Prerequisite: MATH 152.
- 304. Linear Algebra. (3-0). Credit 3.** Introductory course in linear algebra covering abstract ideas of vector space and linear transformation as well as models and applications of these concepts; i.e. systems of linear equations, matrices and determinants.
- 308. Differential Equations. (3-0). Credit 3.** Linear equations, solutions in series, solutions using Laplace transforms, systems of differential equations, partial differential equations and boundary value problems. Fourier series. Prerequisite: MATH 253 or equivalent.
- 311. Topics in Applied Mathematics I. (3-0). Credit 3.** Matrices, determinants, systems of linear equations, eigenvalues, eigenvectors, diagonalization of symmetric matrices. Vector analysis; normal derivative, gradient, divergence, curl, line and surface integrals, Gauss', Green's and Stokes' theorems. Prerequisite: MATH 221 or 253 or equivalent.
- 312. Topics in Applied Mathematics II. (3-0). Credit 3.** Fourier series, Gibbs' phenomenon, Fourier integral and transform, orthogonal functions. Partial differential equations and boundary value problems; Sturm-Liouville systems and applications to vibrating systems, heat flow and potential theory. Prerequisite: MATH 308 or equivalent.
- 485. Problems. Credit 1 or more.** Special problems in mathematics not covered by any other course in the curriculum. Work may be in either theory or laboratory. Prerequisite: Approval of department head.
- 489. Special Topics in . . . Credit 1 to 4.** Study of selected topics in an identified area of mathematics. May be repeated for credit. Prerequisite: Approval of instructor.

MECHANICS AND MATERIALS (MEMA)

- 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.

METEOROLOGY (METR)

- 302. Weather Reports and Forecasting (3-0). Credit 3.** Basic description of atmospheric characteristics and processes relevant to the understanding of weather patterns and atmospheric principles.

NAUTICAL SCIENCE (NAUT)

- 103. Maritime Orientation and 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. Prerequisite: 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. Prerequisite: NAUT 200, 301, 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. Prerequisite: NAUT 200, 300, 304 or equivalent, MART 321, or permission of department head.
- 401. Seamanship IV. (2-3). Credit 3.** Principles and methods of propulsion and steering of ships. Ship handling in narrow channels and heavy seas, docking, undocking, anchoring, mooring and towing are stressed. Also covered is the new equipment introduced into the industry in recent years.
- 404. The Navigator. (2-3). Credit 3.** Intensive, in-depth review of the principles of electronic, celestial and terrestrial navigation in preparation for the U.S. Coast Guard examination for Third Mate.

NAVAL SCIENCE (NVSC)

- 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 damage control 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 communications procedures.
- 400. Commissioning Preparation for the New Navy Ensign. (0-2). Credit 1.** Commissioning preparation for prospective MMR/USNR officers, including the Naval Reserve Organization, shipboard routine, officer and enlisted rank/rate structure, duties and responsibilities of the junior naval officer, naval customs and fundamentals. Detailed presentation of the many career options available to commissioned officers in the United States Navy. Prerequisite: junior or senior standing and within final three semesters.
- 485. Problems. Credit 1 to 4.** Directed study in problems in the field of naval science not covered by other courses in the department. Prerequisite: Senior classification and approval of department head.

OCEAN ENGINEERING (OCEN)

- 300. Wave Mechanics. (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. Prerequisite: CVEN 311, MEEN 213 .
- 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: CVEN 311 ; OCEN 300.
- 462. Hydromechanics. (3-0). Credit 3.** Kinematics of fluids, Incompressible, irrotational and turbulent flow. Navier-Stokes equations, flow of viscous fluids. Prerequisites: CVEN 311 and MATH 308.

OCEANOGRAPHY (OCNG)

- 401. Introduction to Oceanography. (3-0). Credit 3.** Subject matter survey. Interdisciplinary relationship between biological, chemical, geological, and physical aspects of field. Prerequisite: 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 130 or equivalent.
- 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.** Continuation of Physics 218. Electricity, magnetism and optics. Prerequisite: MATH 152 or equivalent; 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 (POLS)

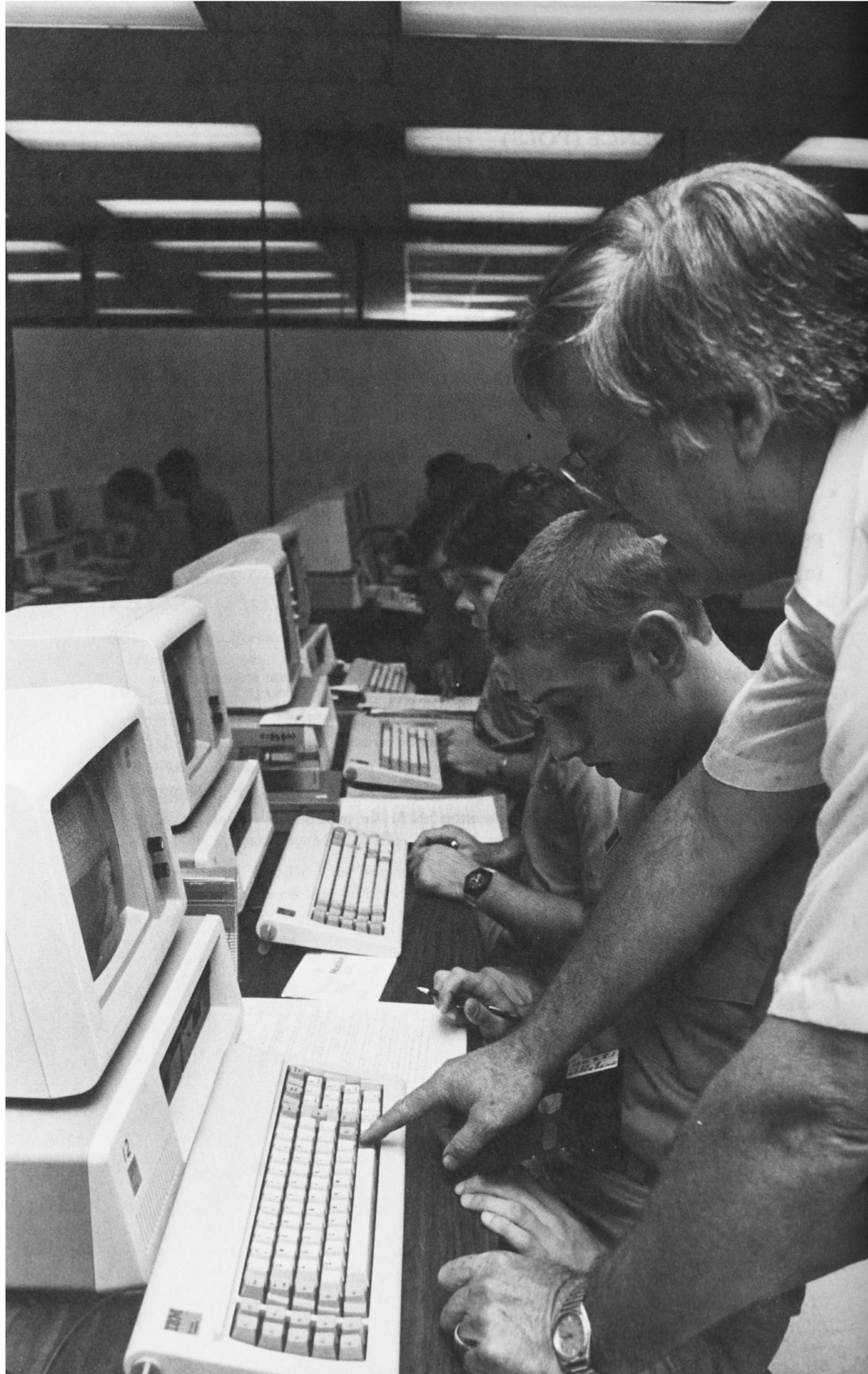
- 206. American National Government. (3-0). Credit 3.** Survey of American national government, politics and constitutional development.
- 207. State and Local Government. (3-0). Credit 3.** Survey of state and local government and politics with special reference to the constitution and politics of Texas.
- 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: POLS 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: POLS 206 or approval of department head.

PSYCHOLOGY (PSYC)

- 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.



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

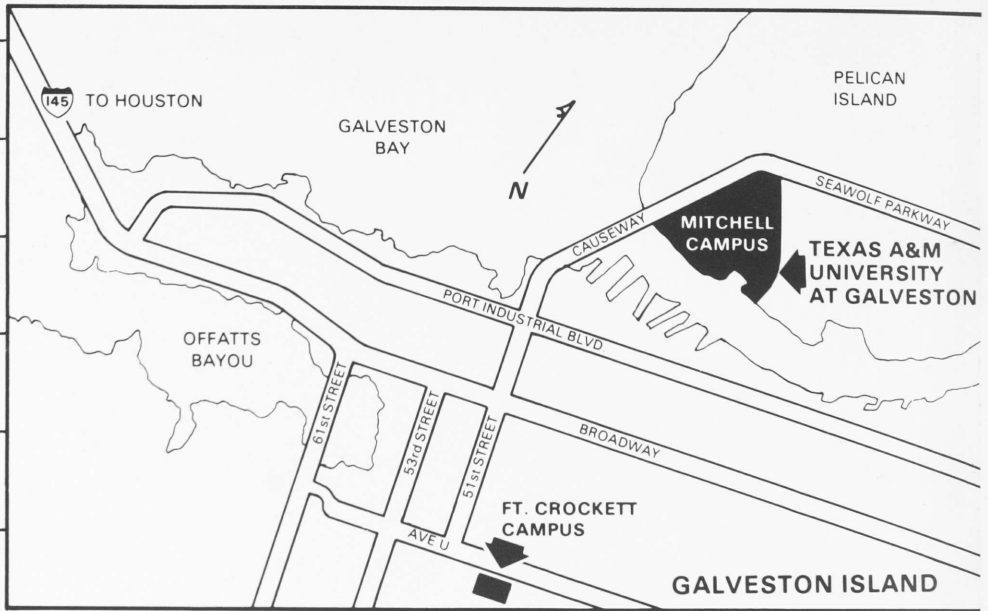
(Current as of September 15, 1986, figures in parentheses indicate data of first appointment at the University and date of appointment to present position, respectively.)

- ALDRICH, David V.**, Professor of Marine Biology (1971, 1978).
B.A., Kenyon College, 1950; M.A., Ph.D., Rice University, 1952, 1954.
- ALEXANDER, Harold C.**, P.E., Associate Professor of Marine Engineering and Head of the Department (1981, 1987).
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 (1981).
B.S., University of Houston, 1972; M.S., Ph.D., Louisiana State University, 1973, 1976.
- ALLISON, Walter K.**, Lecturer in Marine Transportation (1986). B.S. Texas A&M University at Galveston, 1977.
- BLOZINSKI, Anthony P.**, Associate Professor of General Academics (Mathematics) (1976, 1980).
B.S., Seattle University, 1966; M.S., Ph.D., Purdue University, 1968, 1970.
- BRAY, Elliot O.**, Lecturer in Marine Sciences and Director of the Data Processing Center (1980).
B.S., Lamar University, 1962; M.S., Texas A&M University, 1967.
- CHANG, Tyne-Hsien**, Associate Professor of Maritime Systems Engineering and Head, Department of Maritime Systems Engineering (1981, 1984).
B.S., National Chen-kung University, 1974; M.S., Ph.D., University of Florida, 1978, 1981.
- CLAYTON, William H.**, Professor of Marine Sciences (1971).
B.S., Bucknell University, 1949; Ph.D., Texas A&M University, 1956.
- COLE, Collier M.**, Lecturer in General Academics (Psychology) (1983).
B.A., University of California at Los Angeles, 1971; M.A., Ph.D., University of Houston, 1973, 1976.
- COLEMAN, Charles H., Jr.**, Lecturer in Marine Sciences (1977).
B.S., Texas A&M University, 1974.
- CRAVEY, Melanie J.**, Assistant Professor of Marine Sciences (Chemistry) (1983, 1986).
B.S., Lamar University, 1972; Ph.D., University of Houston, 1977.
- CRISP, Edward L.**, Lecturer in Marine Sciences (Geology) (1977).
B.S., Morehead State University, 1969; M.S., University of Kentucky, 1973; Ph.D., Indiana University, 1975.
- CURLEY, Stephen J.**, Associate Professor of General Academics (English) and Head the Department of General Academics (1973, 1985).
B.A., Fordham University, 1968; Ph.D., Rice University, 1974.
- DAVIS, Ralph G.**, P.E., Associate Professor of Marine Engineering and Associate Dean, Texas Maritime College, (1980, 1984).
B.S., U.S. Naval Academy, 1954; M.S., Massachusetts Institute of Technology, 1960; M.S.A., George Washington University, 1970.
- ELLIS, Albert L. III**, Lecturer in General Academics (Political Science) (1985).
B.A., M.P.H., University of North Carolina, 1967, 1975; M.A., Rice University, 1985.

- 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.
- FOLDEN, Charles A.**, Lecturer in Marine Sciences (Chemistry) (1979).
B.S., California State University, Long Beach, 1975; M.A., Governors State University, 1979.
- GARBER, Paul A.**, Assistant Professor of Marine Transportation (1986).
B.S., U.S. Merchant Marine Academy, 1971; M.A., Ph.D., Jagielloman University, 1977, 1981.
- GARDNER, Mary**, Lecturer in General Academics (English) (1985).
B.S., University of Wisconsin, 1959; M.A., University of Chicago, 1981.
- GRIFFIN, Lawrence L.**, Associate Professor of Marine Sciences (Chemistry) (1976, 1984).
B.A., M.S., Ph.D., University of Texas at Austin, 1962, 1965, 1972.
- HARPER, Donald E. Jr.**, Associate Professor of Marine Biology (1975, 1980).
B.S., University of Miami, 1963; M.S., Ph.D., Texas A&M University, 1966, 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.
- HITE, Gerald E.**, Associate Professor of Marine Sciences (Physics) (1980, 1984).
B.S., Case Western Reserve, 1962; M.S., University of Illinois, 1964; Ph.D., University of Illinois, 1967; Habilitation, Universitat Kaiserslautern, 1974.
- JENG, Judy**, Lecturer in General Academics (Library Science) (1985).
B.A., National Taiwan University, 1981; M.L.I.S., University of Texas at Austin, 1984.
- 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.**, Associate Professor of Marine Biology (1978, 1985).
B.A., University of Washington, 1966; Ph.D., Tufts University, 1973.
- KLEIN, Douglas J.**, Associate Professor of Marine Sciences (Physical Chemistry) (1979).
B.S., Oregon State University, 1964; M.A., Ph.D., University of Texas, 1967, 1969.
- KNOX, Kris J.**, Lecturer in Maritime Administration (1984).
B.B.A., M.B.A., University of Houston, 1979, 1984.
- KUHLMAN, Deborah**, Lecturer in General Academics (English) (1986).
B.A., Texas Christian University, 1970; M.A., University of Arkansas, 1980; Ph.D., Texas Christian University, 1985.
- LANDRY, Andre M., Jr.**, Associate Professor of Marine Biology (1976, 1981).
B.S., Tulane University, 1968; M.S., Ph.D., Texas A&M University, 1971, 1977.
- LINN, Johnnie B. III**, Assistant Professor of Maritime Administration (1983).
B.S., Massachusetts Institute of Technology, 1969; M.S., Texas A&M University, 1975; J.D., University of Miami, 1978; Ph.D., Texas A&M University, 1984.

- MAGEE, Eugene J.**, Lecturer in Marine Transportation (1982).
B.S., New York Maritime Academy State University of New York, 1976.
- McCLOY, James M.**, Professor of Marine Sciences (Marine Geography) and Director, Coastal Zone Laboratory (1971, 1984).
B.A., California State College at Los Angeles, 1961; Ph.D., Louisiana State University, 1969.
- McKEEVER, Maureen A.**, Lecturer in Marine Transportation (1985).
B.S., United States Merchant Marine Academy, 1983; M.B.A., University of Pittsburgh, 1985.
- MOORE, John A.**, Lecturer in Marine Engineering (1965).
B.S., Rose Polytechnic Institute, 1934.
- MOORE, Sylvia M.**, Lecturer in Marine Sciences (Chemistry) (1975).
B.S., San Diego State University, 1955.
- MUCKLOW, Richard J.**, Lecturer in General Academics (Library Sciences) (1986).
B.A., University of Montana, 1983; M.L.S., Louisiana State University, 1985.
- NANCE, James M.**, Lecturer in Marine Biology (1984).
B.S., M.S., Brigham Young University, 1974, 1976; Ph.D., Texas A&M University, 1984.
- PARK, Edward T.**, Professor of Marine Biology (1971, 1983).
B.S., M.S., Pusan Fisheries College (Korea), 1952, 1957; Ph.D., University of Washington, 1965.
- PICKFORD, Lavon J.**, Assistant Professor of Maritime Administration (1983, 1986).
B.S., Iowa State University; M.B.A., Ph.D., University of Houston, 1977, 1985.
- PINEBROOK, William E.**, Associate Professor of Marine Engineering (1984).
B.S., Royal Netherlands Naval Academy, 1955; B.S., New York Institute of Technology, 1976; M.E., Florida Atlantic University, 1978; Ph.D., University of Houston, 1982.
- RAY, Sammy M.**, Professor of Marine Biology; Coordinator of TAMU Graduate Programs in Galveston (1971).
B.S., Louisiana State University, 1942; M.S., Ph.D., Rice University, 1952, 1954.
- SCHLEMMER, Frederick C. II**, Associate Professor of Marine Sciences (Oceanography) (1978, 1985).
B.S., U.S. Naval Academy, 1965; M.A., University of South Florida, 1971; Ph.D., Texas A&M University, 1978.
- SCHMALZ, Thomas G.**, Associate Professor of Marine Sciences (Chemistry, Computer Science) (1981).
B.S., Montana State University, 1970; Ph.D., University of Illinois, 1975.
- SCHOB, David E.**, Associate Professor of General Academics (History, Summer Cruise) (1971, 1977).
B.A., M.A., Ph.D., University of Illinois, 1963, 1965, 1970.
- SCHWARZ, John R.**, Professor of Marine Biology and Head, Department (1976, 1986).
B.S., Ph.D., Rensselaer Polytechnic Institute, 1967, 1972.
- SEITZ, William A.**, Associate Professor of Marine Sciences (Chemistry) and Head, Department of Marine Sciences (1977, 1980).
B.A., Rice University, 1970; Ph.D., University of Texas at Austin, 1973.

- SHIPMAN, Natalie W.**, Lecturer in General Academics and Head Librarian (1982).
B.A., Pennsylvania State University, 1971; M.S., Drexel University, 1973; M.S., University of Tennessee, 1980.
- STUTZMAN, James R.**, Assistant Professor of Maritime Administration (Finance) and Head, Department of Maritime Administration (1984, 1986).
B.A., University of Texas, 1966; M.A., M.B.A., Ph.D., University of Houston, 1973, 1978, 1982.
- SUEN, Ching Y.**, Assistant Professor of General Academics (Mathematics) (1984).
M.S., Tsing Hua University, 1978; Ph.D., University of Houston, 1983.
- SZUCS, Joseph**, Associate Professor of General Academics (Mathematics) (1980, 1984).
B.S., Ph.D., Szeged University, 1965, 1973.
- TALWAR, Devki N.**, Assistant Professor of Marine Science (Physics) (1982, 1983).
B.S., M.S., Agra University, 1968, 1970; Ph.D., Allahbad University (India), 1976.
- TORMOLLAN, Frances C.**, Professor Emeritus of Marine Engineering, (1971, 1986).
B.S., M.S., University of Texas at Austin, 1955, 1957.
- VAN LOO, William C.**, Lecturer in Marine Engineering (1982).
B.S., City College of New York, 1969; M.A., Hofstra University, 1973.
- WALSH, John B.**, Assistant Professor of General Academics (Mathematics) (1984).
B.S., M.S., University of Houston, 1973, 1976; Ph.D., North Texas State University, 1983.
- WANG, Y.H.**, P.E., Professor of Maritime Systems Engineering (1980).
B.S., National Taiwan University, 1952; M.S., San Jose State University, 1962; Ph.D., University of Southern California, 1972.
- WARDLE, William J.**, Associate Professor of Marine Biology and Vice President for Academic Affairs (1973, 1983).
B.S., Lynchburg College, 1963; M.S., Ph.D., Texas A&M University, 1970, 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.
- WILLETT, Donald E.**, Lecturer in General Academics (History) (1985).
B.A., St. Edward's University, 1972; M.A., Stephen F. Austin State University, 1976; Ph.D., Texas A&M University, 1985.
- WILSON, Paul C.**, P.E., Lecturer in Maritime Systems Engineering (1981).
B.S., A&M College of Texas, 1948; M.S., University of Houston, 1974.
- WOODS, Henry S. III**, Assistant Professor of Marine Transportation (1984).
B.S., Maine Maritime Academy, 1966. M.S., University of Southern California, 1983.
- YIN, Paul K.**, P.E., Assistant Professor of Marine Engineering (1984).
B.S., National Taiwan University, 1961; M.S., Ph.D., Texas A&M University, 1968, 1973.



Telephone Information:

Admissions and Records	(409) 740-4415
Campus Operator	740-4400
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