CALIFORNIA MARITIME ACADEMY

General Catalogue

1956

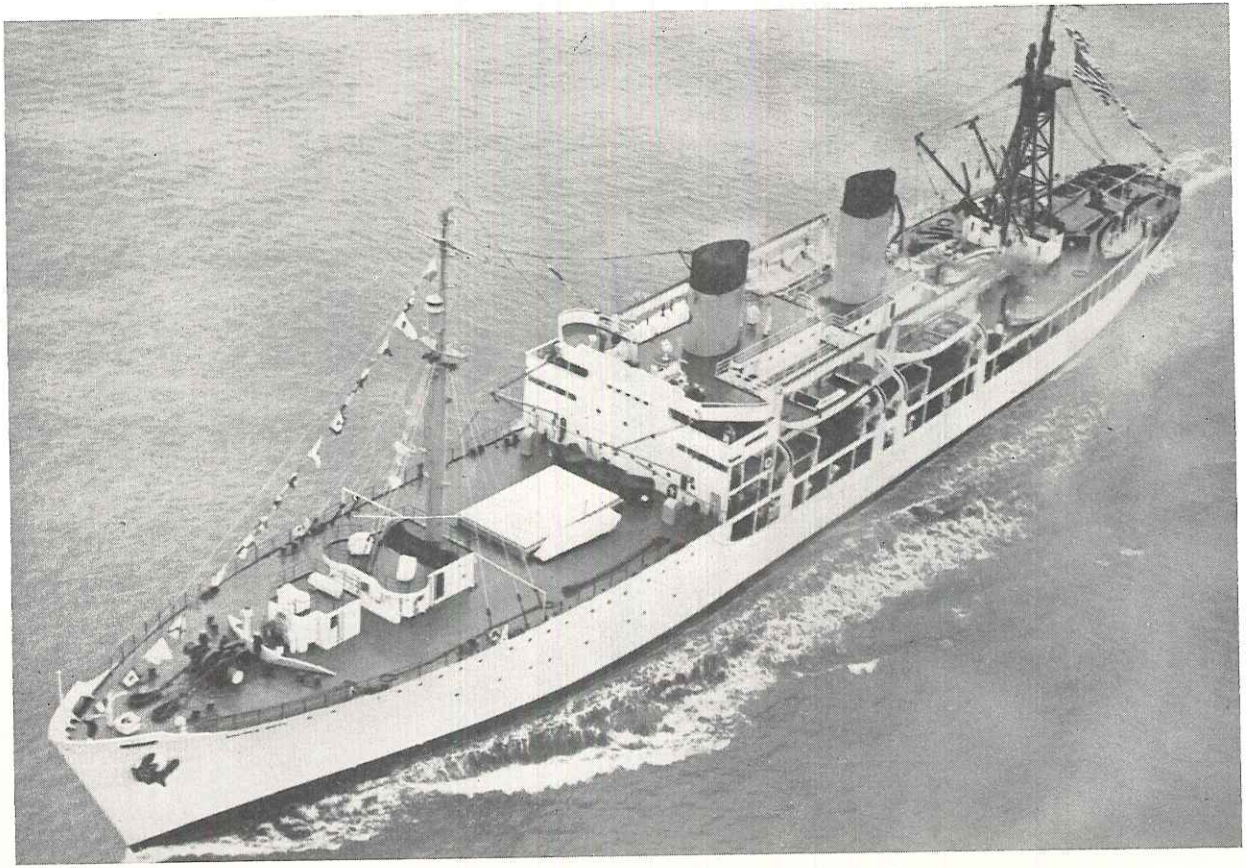
VALLEJO, CALIFORNIA

CALIFORNIA
MARITIME ACADEMY

General Catalogue

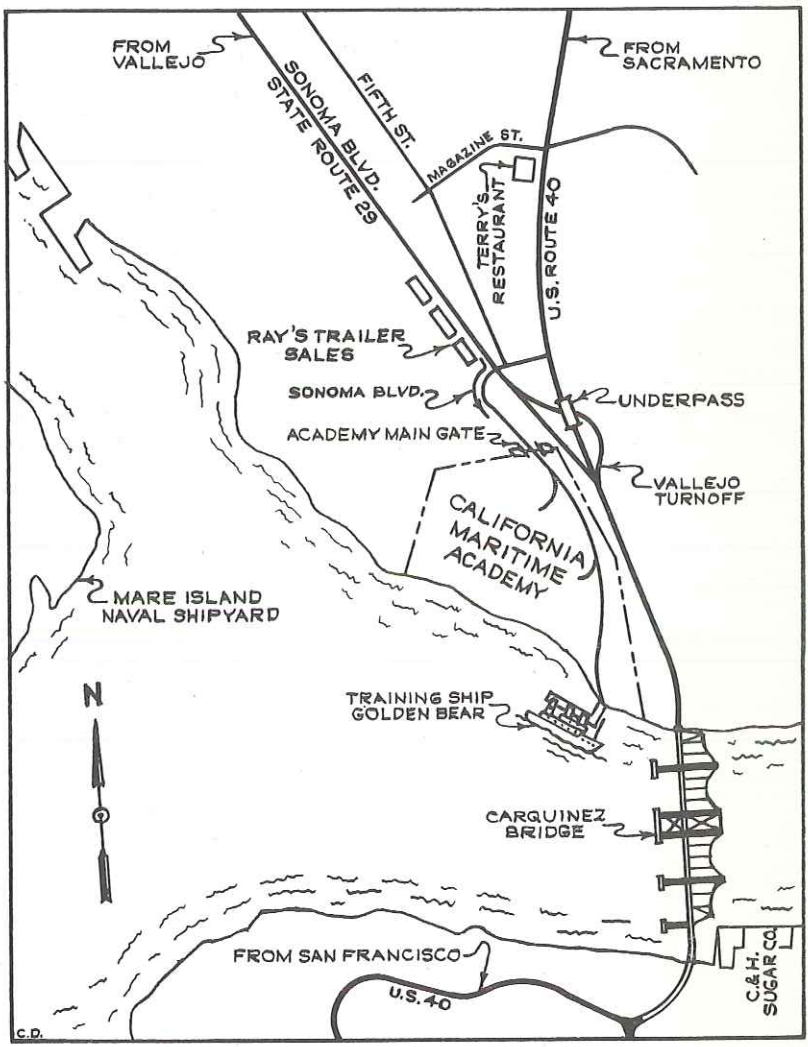
1956

VALLEJO, CALIFORNIA



Training Ship *Golden Bear*, California Maritime Academy

TABLE OF CONTENTS



APPROACHES TO CALIFORNIA MARITIME ACADEMY

FOREWORD

The sea is a lovely lady, a capricious maiden, or a raging monster. Since the beginning of recorded time, man, under the urge of his venturesome spirit, has pitted his will, ingenuity, and skill against this vicious and explosive element of nature.

This unending battle has compelled man to extend his inventive genius to the utmost in the constant effort to develop ways and means to retain supremacy. No longer does the seafarer depend upon incantation, incense, and intuition to gain a livelihood from the sea. The practice of the maritime profession has become an exact science demanding the ability to lead men and utilize efficiently the tools of the trade. It is the purposeful objective of the California Maritime Academy to infuse the adventurous tyros who have chosen this hard profession with knowledge of this science so that they may go forth and achieve victory at sea.

CALIFORNIA MARITIME ACADEMY

APPROXIMATE ACADEMIC CALENDAR

20 Aug.	First trimester begins.
3 Sept.	Labor Day holiday.
19 Dec.	Christmas holiday leave begins.
2 Jan.	First trimester ends. Cruise trimester begins. Christmas holiday leave expires. Shipyard overhaul of Training Ship *Golden Bear* begins.
30 Jan.	Training Ship *Golden Bear* departs San Francisco for cruise.
15 Mar.	Training Ship *Golden Bear* returns to base. Cruise trimester ends. Post-cruise recess begins.
25 Mar.	Post-cruise recess ends. Third trimester begins.
17 May	Training Ship *Golden Bear* to San Francisco for World Trade Week.
22 May	National Maritime Day.
23 May	Training Ship *Golden Bear* returns to base.
26 July	Final examinations for first class.
6 Aug.	Final examinations for second and third classes.
8 Aug.	First class sit for U. S. Coast Guard licenses.
10 Aug.	Graduate exercises. Graduation leave begins.
26 Aug.	Academic year begins. Graduation leave ends.

Slight variations in this calendar may be expected due to variation in duration of cruise trimester

The Friday after Thanksgiving is an academic holiday

CALIFORNIA MARITIME ACADEMY
CALIFORNIA STATE DEPARTMENT OF EDUCATION

EXECUTIVE OFFICERS

ROY E. SIMPSON
State Superintendent of Public Instruction and
Director of Education

J. BURTON VASCHE
Associate Superintendent of Public Instruction and Chief,
Division of State Colleges and Teacher Education

JOEL A. BURKMAN
Assistant Division Chief of State Colleges and
Teacher Education

BOARD OF GOVERNORS

Dr. Roy E. Simpson.....Executive Member, Ex Officio
Mr. Ralph D. Sweeney, Los Angeles.....Chairman
Mr. Hugh Gallagher, San Francisco.....Member
Mr. Gene M. Harris, Santa Barbara.....Member
Mr. Ellis R. Randall, Vallejo.....Member

ADMINISTRATIVE STAFF

Captain Henry E. Richter, USN (Ret.).....Superintendent
B.S., U. S. Naval Academy

Captain Carroll T. Bonney, USN (Ret.).....Dean of Instruction
B.S., U. S. Naval Academy; M.A., Stanford University

Captain Ralph M. G. Swany, CMA, 1933
Head of Department of Navigation and Seamanship
Commanding Officer Training Ship *Golden Bear*

Commander Richard D. Heron, CMA, 1938
Commandant of Midshipmen
Executive Officer Training Ship *Golden Bear*

Commander Frank Flanner, CMA, 1935
Head of Department of Engineering
Chief Engineer Training Ship *Golden Bear*

Commander E. E. Keeley.....Business Manager

Lieutenant Commander Louis K. Payne, USNR
Head of Department of Naval Science

3—19570

INSTRUCTIONAL STAFF

CAPT. Carroll T. Bonney, USN (Ret.)—Dean of Instruction

DECK DEPARTMENT

CAPT. Ralph M. G. Swany, CMA, 1933—CAPT USNR. Federal license: Master, steam and motor vessels, ocean, unlimited.

CDR Richard D. Heron, B.S., CMA, 1938—LCDR USNR. Federal license: Chief Mate, steam and motor vessels, ocean, unlimited.

LCDR Noel B. Martin, B.S., CMA, 1942—LT USNR. Federal license: Master, steam and motor vessels, ocean, unlimited.

LCDR Frederick A. Nied, B.S., CMA, 1942—Federal license: Master, steam and motor vessels, ocean, unlimited.

LT. Donald A. Pederson, CMA, 1934—Federal license: Chief Mate, steam and motor vessels, ocean, unlimited.

CBOSN John M. Rennick—CBOSN USN (Ret.) Practical Seamanship

ENGINEERING DEPARTMENT

CDR Frank Flanner, CMA, 1935—CDR USNR. Federal license: Chief Engineer, steam vessels, ocean, unlimited.

LCDR Weston F. Averill, B.S., CMA, 1939—LT USNR. Federal license: Chief Engineer, steam vessels, ocean, unlimited.

LT. Charles B. Dunham, CMA, 1945—LT USNR. Federal license: First Assistant Engineer, steam vessels, ocean, unlimited. Third Assistant Engineer, motor vessels, ocean, unlimited.

LT. Frank L. LaBombard—CMACH USNR. Federal license: Second Assistant Engineer, steam vessels, ocean, unlimited.

LT. Arthur S. Behm, Jr., B.S., CMA, 1942—LT USNR. Federal license: Second Assistant Engineer, steam vessels, ocean, unlimited.

LT. Donald L. Lipman, B.S., CMA, 1951—LTJG USNR. Federal license: Third Assistant Engineer, steam and motor vessels, ocean, unlimited.

LT. William T. Hale, B.S., CMA, 1951—LTJG USNR. Federal Second Assistant Engineer, steam and motor vessels, ocean, unlimited. On military leave 1955-1956.

NAVAL SCIENCE DEPARTMENT

Louis K. Payne, LCDR USNR
Sherman L. Voiler, LT USN
Ernest Tennes, LT USN
Lewis L. Jackson, GMC USN
Walter F. Milnes, FCC USN
Kenneth J. Fox, YNC USN

MEDICAL DEPARTMENT

Charles H. Pritchett, LT, Medical Service Corps, USN (Ret.)

HISTORY

The California Maritime Academy was originally established in 1929 as the California Nautical School by act of the State Legislature and is a unit of the State Department of Education on the state college level. Its mission is to train young men for officers in the Merchant Marine Service.

Federal authority and encouragement for state nautical schools derives from an act of Congress passed in 1874. While it is distinctly an educational agency of the State of California, the Federal Martime Administration has a strong interest in and extends considerable assistance to the Academy.

Federal Martime Administration interest stems directly from a mandate of the Congress, expressed in the Merchant Marine Act of 1936, which directs the maintenance of an adequate Merchant Marine to support American domestic and foreign commerce and to meet the requirements for national defense. The act prescribes that the Merchant Marine be "manned with a trained and efficient citizen personnel."

OBJECTIVE

The student enters the academy with the maritime profession as his definite and primary objective. The entire course, both academic and practical, is designed to prepare him for this objective. No elective subjects are provided, and no subjects are taught which do not bear directly on the ultimate goal. In addition to purely academic or practical instruction, the general experience acquired by the students living together on the base and aboard ship provides invaluable training for their future careers.

The students also receive instruction in naval science under the auspices of the Navy Department, the program thus providing both maritime and naval training which equips the graduate with both merchant and naval experience, a most valuable asset in time of national emergency.

LOCATION

The California Martime Academy is located on the north shore of Carquinez Straits, just south of the City of Vallejo. It is about one hour's drive on U. S. Highway 40 from San Francisco. Main bus lines stop within a few minutes walk of the entrance to the academy grounds. The Mare Island Naval Shipyard is in the immediate vicinity and is available to the academy for observation of dry-docking, heavy shop practice, ship repair procedures, and electronic developments. Ocean-going steamers and naval vessels pass through Carquinez Straits en route to and from Sacramento and San Joaquin River ports.

ORGANIZATION

Responsibility for immediate management and operation of the academy is vested by state law in the superintendent who is appointed by and responsible to the board of governors. The superintendent is a retired naval officer with long experience at sea. His appointment is approved by the Federal Maritime Administration, the Navy Department, and the California State Department of Education.

The instructors are also the officers of the Training Ship *Golden Bear*, insuring sound continuity and relationship between studies during the academic trimesters and practical experience on the annual training cruise. Every member of the faculty has a creditable record of service in the Merchant Marine or in the Navy, and most have experience in both. The Navy Department assigns three officers and several chief petty officers, as instructors in naval science.

The instructional program at the academy is carried out by three departments, the Deck, Engineering, and Naval Science Departments. For the necessary military functions, the student body is organized into companies which comprise the Corps of Midshipmen.

PROGRAM

Students at the California Martime Academy receive three years of college education. Since the academy is in session for 11 months of each year, this approximates four years of instruction in regular sessions or three regular sessions and three summer sessions in most colleges. The bachelor of science degree is conferred upon graduation.

The Deck Department courses provide a knowledge of ship design and operation which fits the graduate for the duties of a deck officer in the Merchant Marine or Naval Reserve.

The courses in the Engineering Department prepare the graduate to perform the duties of an engineer officer afloat.

The Naval Science Department provides instruction, which, in conjunction with courses in other departments, equips physically qualified and selected graduates for commissions in the U. S. Naval Reserve.

Each academic year is divided into trimesters. The two academic trimesters of approimately 17½ weeks each, are separated by the cruise trimester of 13 weeks. There is a 10-day vacation at the end of each trimester.

During the academic trimesters, the forenoon is devoted to classroom work and the afternoon to practical instruction in shop practice, boat handling, and shipboard procedures. During the cruise trimester, which includes a shipyard overhaul period and a cruise of about 10,000 miles to foreign and United States ports, the midshipmen are divided into three groups: a watch-standing group, a maintenance group, and a study group, with all midshipmen rotating through all groups. By operating their own ship, under the supervision of the officer-instructors, the midshipmen learn at first hand the duties and responsibilities of officers of

the Merchant Marine and put into practice the theoretical knowledge learned in the classrooms ashore. Upon graduation, they are thus fully qualified for license as ship's officers.

TYPICAL DAILY ROUTINE

MONDAY THROUGH FRIDAY

The following is an example of the normal schedule followed at the academy. Circumstances arise which necessitate deviation from this routine from time to time:

0600—Reveille
0620-0715—Clean up living quarters, prepare for breakfast and classes
0715—Breakfast
0800—Formation for Colors
0805-0855—First period class
0900-0950—Second period class
1000-1050—Third period class
1055-1145—Fourth period class
1200—Noon meal
1300-1530—Practical instruction
1330-1430—Infantry drill (Wednesday only)
1545-1645—Athletics
1715—Evening meal
1900—Call to evening study
2130—Recall from study
2200—Taps

Liberty is normally granted to all midshipmen, except those in the duty section, on week ends.

STUDENT ORGANIZATIONS AND ACTIVITIES

PROPELLER CLUB

The Propeller Club of the United States is a national organization interested in promoting public knowledge of the American Merchant Marine as a vital factor in our national economy and the national defense.

Student ports of this club are chartered in various colleges and universities to promote interest and student activity in matters pertaining to the maritime industry. The Propeller Club port of California Maritime Academy sponsors distinguished speakers, who give timely addresses on maritime and other related subjects.

In 1938 the Propeller Club of the United States inaugurated the Pi Sigma Phi award for Propeller Club students ports. The objectives of this award are to encourage scholastic achievement in the field of shipping and transportation and to give to students with distinguished records in such studies recognition similar to that accorded in other fields of study, such as engineering, chemistry, law, medicine, etc.

SAILING CLUB

The Sailing Club of the California Maritime Academy is composed of midshipmen of the academy who are interested in practicing the art of handling and racing boats under sail.

CAMERA CLUB

The California Maritime Academy Camera Club is an organization composed of students who have a mutual interest in the art of photography. The club has the use of darkrooms aboard the training ship, well equipped to handle all phases of photographic processing.

SPANISH CLUB

The Spanish Club is comprised of midshipmen who are interested in advancing their knowledge of conversational Spanish. Under the guidance of a Spanish-speaking midshipman, the club meets informally two evenings each week.

RADIO CLUB

Midshipmen who are interested in building, maintaining, and operating amateur radio equipment have formed a Radio Club which was organized in 1955. Facilities and equipment for carrying on work in this field are provided at the academy.

HAWSEPIPE

This publication is the Academy annual which is prepared and issued by the senior class. The editorial and business staffs are elected by the midshipmen of the first class. A member of the faculty serves as adviser to provide general guidance and continuity to the effort.

FACULTY ADVISERS

In order to provide a positive point of contact for each midshipman, a system of faculty advisers has been established. The advisers meet with their assigned midshipmen individually or in groups in order to work out problems which may develop. This program gives the midshipman a source of advice and counsel and the assurance that the matters discussed will be held in strictest confidence.

AWARDS AND HONORS

The highest ranking midshipmen in scholarship in the deck and engineering courses are designated honor graduates. They are awarded prizes in recognition of their outstanding performance in the academic and leadership fields.

In addition, certain other prizes are awarded for outstanding merit in specific aspects of the academic course.

The Propeller Club of the United States awards membership in the honor society of Pi Sigma Phi to those students who meet the scholastic standards established for admission to this society.

ATHLETIC PROGRAM

An extensive program of intramural sports is carried on at the academy. Intercompany competition in tennis, basketball, softball, swimming, water polo, modified football, and golf is scheduled throughout the year.

In addition, academy teams are entered in such sports as softball, basketball, and water polo where competition is available in the local area.

The athletic program, as an adjunct to the physical education feature of the curriculum, is considered of vital importance and all midshipmen are encouraged to participate in one or more sports.

FACILITIES

The academy grounds cover an area of 67 acres. A deep water pier provides berthing space for the Training Ship *Golden Bear* and encloses a boat basin for power, sailing and rowing boats. Permanent buildings include the gymnasium and natatorium, mess hall, classroom building, seamanship building and boat shed. Dormitories, administration building, machine shop, engineering, library and reception hall are presently housed in temporary buildings. Development plans call for the replacement of the temporary structures according to an approved program. Tennis and handball courts, and an athletic field provide ample outdoor recreational facilities.

The Federal Maritime Administration has provided the California Maritime Academy with a modern 7,040-ton, twin-screw, turbo-electric drive, 16-knot vessel for the purpose of conducting the annual training cruise of approximately three months each year. The Training Ship *Golden Bear* is operated entirely by the officers of the academy staff, except in the commissary department, and by the midshipmen under training. The *Golden Bear* provides not only a modern training vessel for the actual exercise of deck and engineering practice at sea, but also an excellent laboratory for practical instruction when the students are shore-based. The ship is fitted with classrooms, a machine shop, and the most modern equipment, including large steam and diesel-powered auxiliaries, as well as turbo-electric propulsion. Reading and recreation rooms provide the necessary facilities for off-duty activities.

HEALTH SERVICE

The Academy employs a male hospital technician-nurse, who is qualified to administer dispensary treatment and first aid and to make preliminary diagnosis. In cases requiring the services of a physician or hospitalization, the students are sent to the U. S. Public Health Service hospital in San Francisco. There is no cost involved in this service.

The hospital technician is assigned duty on the Training Ship *Golden Bear* during the cruise period and acts as an assistant to the medical officer, who is employed for the cruise only.

ROUTINE

A military routine is followed. Midshipmen wear uniform, follow a prescribed schedule for classes, drills, meals, study hours, physical exercise, reveille and taps. Military etiquette is observed as a matter of gentlemanly courtesy between associates engaged in a mutual enterprise.

While major emphasis is placed on preparing the midshipman to perform the tasks and duties required in connection with operating and maintaining a ship, the qualities of leadership are also stressed and the final multiple for class standing assigns this factor considerable weight. Serious disciplinary infractions, or an excessive number of lesser offenses, constitute grounds for dismissal or being dropped for inaptitude, with no remission of fees.

Under normal circumstances, midshipmen are granted liberty on week ends. Special liberty is granted on request in cases of emergency or for specific reasons. Leave is granted over holiday periods. The wearing of civilian clothes on leave or liberty, except while on the annual training cruise, is optional.

Midshipmen may keep licensed automobiles on the Academy grounds provided they are adequately covered by insurance for personal liability and property damage.

ADMISSION

GENERAL INFORMATION

Admission requirements established by the Board of Governors are as follows:

> "The candidate for admission must be of good repute, must provide three letters of recommendation, preferably from school officials or employers, must be a citizen of the United States, unmarried, and have a high school education or its equivalent. Upon entry to the academy he must be not less than 17 years of age and not yet 23 years of age (27 years for veterans). Applicant must be of normal size and weight, sound and robust in body and free from physical defects. Prior to admission to the academy he must take the standard Navy physical examination for officer candidates."

A recent State Senate Concurrent Resolution provides for a system of appointments to the academy on the basis of a state-wide competitive examination.

A specified number of qualified appointees will be designated according to senatorial and assembly districts, with an additional number to be designated by the Governor. Regulations regarding the establishment of this new system are in the process of development. Information concerning its operation may be obtained by contacting the Dean of Instruction.

ELIGIBILITY

Any male citizen of the United States who meets the prescribed moral, scholastic, and physical requirements is eligible to enter the California

Maritime Academy. He is not required to be a resident of the State of California in order to be admitted. Applicants are accepted from any part of the United States and its territories within the capacity limitations of the Academy.

All students must be unmarried at time of admission. A student marrying prior to graduation will be considered as having resigned from the Academy.

Students are enrolled in one of two categories: (a) those with U. S. Naval Reserve status, and (b) those without such status. Both categories receive the same education and training.

An applicant who is in all respects acceptable to the Academy and who satisfies U. S. Navy requirements will be enrolled in the U. S. Naval Reserve. As such, he receives certain financial advantages, is deferred by Selective Service, and, if selected by the Navy Department, is commissioned Ensign U. S. Naval Reserve upon graduation.

An applicant who is otherwise acceptable to the Academy but who does not meet U. S. Navy requirements will be enrolled in a non-USNR status, provided he meets the lesser physical requirements of the U. S. Coast Guard for licensing as an officer of the U. S. Merchant Marine. With respect to Selective Service, such a student is in the same status as any other college student. If, subsequent to enrollment, the defects which prevented acceptance by the Navy are corrected, transfer to USNR status can be effected.

SCHOLASTIC REQUIREMENTS

Prior to admission (but not necessarily prior to taking entrance examinations) applicants must have graduated from high school or have established evidence of equivalent education. Transcripts of high school records or certificates of equivalency must be submitted.

All candidates for admission, except transfer students from another maritime academy or maritime college, must pass an entrance examination. This examination consists of four parts: high school English, mechanical aptitude, arithmetical reasoning, and general scholastic aptitude. All tests are of the objective type. The exact dates, times, and places of examinations may be obtained by writing to the Dean of Instruction.

PHYSICAL REQUIREMENTS

Candidates for admission must be mentally and physically sound, well formed and of robust constitution.

Applicants who fail the Navy physical examination and who wish to enter in a non-naval status must pass a less rigid physical examination administered by the U. S. Public Health Service. The principal requirements of this examination are:

For original license as master, mate, or pilot, the applicant must have either with or without glasses, at least 20/20 vision in one eye and 20/40 in the other. The applicant who wears glasses, however, must also be able to pass a test without glasses of at least 20/40 in one eye and 20/70 in the other.

For original license as engineer the applicant must have, either with or without glasses, at least 20/30 vision in one eye and 20/50 in the other. The applicant who wears glasses, however, must be able to pass a test without glasses of at least 20/50 in one eye and 20/70 in the other.

Epilepsy, insanity, acute venereal disease or neurosyphilis, badly impaired hearing, or other defect that would render the applicant incompetent to perform the ordinary duties of an officer at sea are causes for rejection.

EDUCATIONAL LOANS

There is a limited number of financial assistance programs available to worthy and qualified students under which funds may be borrowed to meet the necessary expenses for matriculation. Repayment is deferred until after graduation, permitting the student to complete his education and refund the cost thereof after employment is obtained. For further information regarding these funding programs, contact the Dean of Instruction.

FEES

The tuition fee required for registration is dependent upon the legal residence of the applicant, as follows:

(a) Resident California students ..... $405* per year
(b) Nonresident students ..... 675* per year

The academic year is divided into three trimesters. *Fees may be paid in three installments of $135 each for residents and $225 each for nonresident students. The first installment is payable upon registration.*

Fees for second and third trimesters will be due and payable about 2 January and 30 March, the approximate dates of the beginning of the last two trimesters.

In addition, students must deposit with the Business Manager each year an amount sufficient to cover the cost of uniforms, books, tools, etc. This deposit is subject to change due to price fluctuations. Approximate amounts are, first year $300, second year $50, third year $50. Unexpended balance is refunded.

A student body fee of $25 per year, payable to the Golden State Service Fund, must be paid at the beginning of each school year.

* Includes board and room.

DESCRIPTION OF COURSES

NUMBERING AND CLASSIFICATION

Courses are numbered as follows: those given in the first year are numbered 1-49; second year are numbered 100-149; third year are numbered 150-199. Courses given only in the first trimester are assigned odd numbers; courses given only in the third trimester are assigned even numbers. To the numbers of the full year courses the letter "A" has been appended to indicate first trimester of the sequence; the letter "B" to indicate second trimester. (Example: G1-A–G1-B English.)

Courses in the Department of Navigation and Seamanship are classified as Deck Courses and are indicated by the prefix "D." Those in the Department of Marine Engineering are classified as Engineering Courses, and have the prefix "E." General Courses required of all midshipmen are prefixed "G." Naval Science Courses have the prefix "NS."

CREDIT VALUE

In the following list of courses, the credit value of each course in semester units is indicated by a number in parentheses after the title. A unit consists of one hour of the midshipman's time each week in lecture or recitation during one trimester (17½ weeks), or a longer time in laboratory or other work not requiring preparation.

ACADEMIC CURRICULUM

DEPARTMENT OF NAVIGATION AND SEAMANSHIP

FIRST YEAR

First trimester	*Class hours*	*Third trimester*	*Class hours*
Subject		*Subject*	
G1-A. English	2	G1-B. English	3
G11-A. Engineering Drawing	2	G11-B. Engineering Drawing	2
NS1. Naval Orientation	3	NS2. Naval History	3
D1-A. Mathematics for Navigation (Basic)	4	D1-B. Mathematics for Navigation (Advanced)	4
D21-A. Seamanship (Basic)	3	D12. Navigation (Basic)	3
D31. Marine Rules and Regulations	2	D21-B. Seamanship (Basic)	1
	16		16

SECOND YEAR

G121. U. S. Maritime History	2	NS101-B. Naval Weapons	3
NS101-A. Naval Weapons	3	D101-B. Physics	2
D101-A. Physics	3	D111-B. Navigation (Intermediate)	3
D111-A. Navigation (Intermediate)	3	D122. Seamanship (Intermediate)	3
D123-A. Cargo	3	D123-B. Cargo	3
D131-A Marine Rules and Regulations	2	D131-B. Marine Rules and Regulations	2
	16		16

THIRD YEAR

First trimester		*Third trimester*	
Subject	*Class hours*	*Subject*	*Class hours*
G181. Ship's Medical Practice	1	NS152. Leadership and Naval Justice	2
G191. Ship Construction and Damage Control	3	D152. Ship's Business	3
NS151. Advanced Naval Orientation	3	D154. License Seminar	2
D151. Meteorology	3	D161-B. Navigation (Advanced)	3
D161-A. Navigation (Advanced)	3	D172. Seamanship (Advanced)	3
D181-A. Maritime Law	3	D181-B. Maritime Law	3
	16		16

DEPARTMENT OF MARINE ENGINEERING

FIRST YEAR

First trimester		*Third trimester*	
Subject	*Class hours*	*Subject*	*Class hours*
G1-A. English	2	G1-B. English	3
G11-A. Engineering Drawing	2	G11-B. Engineering Drawing	2
NS1. Naval Orientation	3	NS2. Naval History	3
E1. Engineering Orientation	2	E3-B. Engineering Mathematics	4
E3-A. Engineering Mathematics	4	E12. Marine Boilers	2
E5. Machine Shop Theory	3	E14. Auxiliary Machinery	2
	16		16

SECOND YEAR

G121. U. S. Maritime History	2	NS101-B. Naval Weapons	3
NS101-A. Naval Weapons	3	E101-B. Physics	2
E101-A. Physics	3	E102. Engineering Materials	3
E103. Engineering Chemistry	2	E122. Marine Reciprocating Engines	3
E115. Auxiliary Machinery	2	E141-B. Electrical Engineering	5
E141-A. Electrical Engineering	4		
	16		16

THIRD YEAR

G181. Ship's Medical Practice	1	NS152. Leadership and Naval Justice	2
G191. Ship Construction and Damage Control	3	E152. License Seminar	2
NS151. Advanced Naval Orientation	3	E154. General Rules and Regulations	5
E151. Engineering Administration	1	E162. Refrigeration and Air Conditioning	2
E153. Thermodynamics	3	E171-B. Marine Steam Turbines	2
E171-A. Marine Steam Turbines	2	E181-B. Diesel Engineering	3
E181-A. Diesel Engineering	3		
	16		16

DECK COURSES REQUIRED FOR MIDSHIPMEN IN THE DEPARTMENT OF NAVIGATION AND SEAMANSHIP

D1-A. Mathematics for Navigation (Basic) (4)

Intensive drill in fundamental mathematical operations from arithmetic through algebra with emphasis on rapid and accurate performance of calculations.

D1-B. Mathematics for Navigation (Advanced) (4)

Plane and spherical trigonometry stressing concepts and operations fundamental to the science of navigation.

D12. Navigation (Basic) (3)

Fundamental navigational topics including basic definitions, a rudimentary knowledge of the instruments used by the navigator, charts, piloting, and dead reckoning.

D21-A.—D21-B. Seamanship (Basic) (3-1)

Instruction in lifeboats, davits, lifeboat equipment, emergency drills, sea terms, ship nomenclature, ground tackle, knotting and splicing, blocks and tackles, ship's rigging, and hull maintenance.

D31. Marine Rules and Regulations (2)

A study of the International Regulations for the prevention of collisions at sea.

D101-A. Physics (3)

Elementary physics and its application to shipboard operations and shipboard equipment; composition and resolution of forces, statics, moments and center of gravity, rectilinear motion, Newton's laws, work and energy, simple machines, impulse and momentum, rotation, elasticity, hydrostatics, temperature and expansion, quality of heat, heat transfer, wave motion.

D101-B. Physics (2)

The fundamental principles of electricity concentrating upon the relation of these principles to practical applications which will be encountered by the deck officer in ship operation.

D111-A—D111-B. Navigation (Intermediate) (3-3)

The basic concepts of celestial navigation and nautical astronomy stressing definitions and mathematical solutions of the astronomical triangle; the theory of plotting and advancing a completed line of position.

D122. Seamanship (Intermediate) (3)

Hull maintenance, the operation and maintenance of deck machinery and cargo gear, watch-standing and bridge routine, theory of small-boat handling, use of ground tackle, rescue operations, and fuel conservation.

D123-A—D123-B. Cargo (3-3)

The handling, stowage and safeguarding of cargo aboard ship and the duties of ship's officers in connection therewith.

D131-A. Marine Rules and Regulations (2)

The provisions and applications of the Code of Federal Regulations which implement the International Conventions for Safety of Life at Sea as they pertain to passenger vessels and to cargo and miscellaneous vessels.

D131-B. Marine Rules and Regulations (2)

The essentials of the stowage and carriage of bulk liquid cargo, USCG Rules and Regulations for tank vessels; rules to prevent collisions of vessels on inland waters.

D151. Meteorology (3)

Meteorology for the mariner covering the making of weather observations, preparation of a weather map; weather prediction; weather problems at sea.

D152. Ship's Business (3)

Administrative details of steamship operation including steamship company organization, government agencies, agents and charter parties, insurance, union contracts, safety codes, surveys, duties of masters.

D154. License Seminar (2)

Lecture and discussion in preparation for mates' and masters' license examinations before the Merchant Marine Examiners, United States Coast Guard.

D161-A—D161-B. Navigation (Advanced) (3-3)

Modern tabular methods for solution of the astronomical triangle, advanced plotting, great circle sailing, electronic navigation.

D172. Seamanship (Advanced) (3)

Skills essential for safe operation and efficient maintenance of the deck department of all types of vessels; ship handling, maneuvering, rescue operations, collisions, stranding, hydrostatics, drydocking.

D181-A—D181-B. Maritime Law (3-3)

The rights, obligations and responsibilities of seamen, masters and pilots as prescribed by the laws and regulations of the United States.

ENGINEERING COURSES REQUIRED FOR MIDSHIPMEN IN THE DEPARTMENT OF MARINE ENGINEERING

E1. Engineering Orientation (2)

Fundamentals of the operation of a marine power plant; basic steam cycle, auxiliary steam cycle, fuel oil service system, evaporators.

E3-A—E3-B. Engineering Mathematics (4-4)

A comprehensive review of elementary mathematics from arithmetic through algebra and geometry followed by the necessary coverage of advanced algebra, trigonometry, logarithms, graphic methods, and slide rule instruction for the specialized engineering curriculum.

E5. Machine Shop Theory (3)

Nomenclature and proper use of hand tools used in bench work; nomenclature, use and care of precision measuring instruments; detailed instruction dealing with engine lathes and milling machines, their construction and the procedures and methods used to accomplish various types of operations with these machines; the computation of methods involved in machine operations; the derivation of all formulas used.

E12. Marine Boilers (2)

Detailed coverage of construction, types and operating principles associated with marine steam generating equipment.

E14. Auxiliary Machinery (2)

Deals with most auxiliary units attached to main propulsion plants and with units or systems which in themselves are single systems but, in the complete picture, are auxiliary to the main plant; piping systems, packing, valves, governors, insulation, and pumps.

E101-A—E101-B. Physics (3-2)

First semester course covers mechanics—composition and resolution of forces and velocities, statics, moments of force, rectilinear motion, rotational motion, work, energy, power, friction, simple machines, elasticity, fluids at rest, fluids in motion. Second semester course covers heat—temperature, expansion of solids, liquids and gases, transfer of heat, heat and work, measurement of heat and change of state, first and second laws of thermodynamics.

E102. Engineering Materials (3)

The materials commonly used in a marine engineering plant, their occurrence in nature, the reduction of ore, the production and refining of metal, the structure and alloying of metals, properties and control of properties of metals, casting and mechanical working of metals; petroleum products and plastics; welding and its application.

E103. Engineering Chemistry (2)

Basic chemistry including atomic and molecular structure, Law of Guy-Lussac, Avogadro's Law, acids, bases, salts, chemical equations; feed water treatment including cause and prevention of scale, corrosion, caustic embrittlement, foaming and priming, and methods used in treating and testing water for alkalinity, salinity, hardness, dissolved oxygen, phosphate, sulphite; fuels and combustion including chemistry of combustion, Orsat determination, combustion calculations.

E115. Auxiliary Machinry (2)

A continuation of E14; refrigerating systems, condensers, evaporators, compressed air systems, feed systems.

E122. Marine Reciprocating Engines (3)

Design, construction, operation, care and repair of marine reciprocating engines for propulsion and auxiliary purposes.

E141-A. Electrical Engineering (4)

The fundamentals of electric circuits and machines giving primary importance to the design, operation, and maintenance of equipment in the marine field; basic concepts of electricity and magnetism, direct current circuits and machines.

E141-B. Electrical Engineering (5)

A continuation of E 141-A; alternating current circuits, machines, and control systems, and marine electrical propulsion.

E151. Engineering Administration (1)

An outline and discussion of typical merchant ship engineering organization, emphasizing duties and responsibilities of personnel; the office of the Port Engineer, the functions of the American Bureau of Shipping and the U. S. Coast Guard.

E152. License Seminar (2)

Lecture and discussion in preparation for engineers' license examinations before the Merchant Marine Examiners, U. S. Coast Guard.

E153. Thermodynamics (3)

Basic laws of energy and thermodynamics and their application to heat-power machinery employed on shipboard; heat power plants, principles of thermodynamics, steam and steam calorimetry, steam generators and boilers, feed water heating, reciprocating steam engines, steam engine power and economy, steam and gas turbines, steam condensing equipment, internal combustion engines.

E154. General Rules and Regulations (5)

United States laws and regulations governing construction, repair, operation, inspections, and safety of all American flag vessels.

E162. Refrigeration and Air Conditioning (2)

Review of direct and indirect refrigeration cycles. Basic refrigeration principles and equipment. Basic air conditioning, comfort, and air drying for prevention of cargo damage.

E171-A—E171-B. Marine Steam Turbines (2-2)

The construction of marine steam turbines and their operating principles as applied to main propulsion and auxiliary uses aboard ship.

E181-A—E181-B. Diesel Engineering (3-3)

The development, design, construction, and operating procedures of marine diesel engines and auxiliary machinery and systems employed in the modern marine diesel power plant.

NAVAL SCIENCE COURSES REQUIRED FOR ALL MIDSHIPMEN

NS1. Naval Orientation (3)

General: Students at maritime academies enter upon this course with varied backgrounds of education and experience. Few of them know anything about the Navy. Many have never previously seen either a ship or an ocean. The intent of the NS1 course is to introduce the Navy to the student and develop within the student the interest and enthusiasm which are prerequisites to the acquisition and retention of knowledge of the specific subjects which follow in the second and third year.

The subject matter consists of Naval Organization, Naval Engineering (for deck students) and piloting (for engineering students) (BuPers Curriculum NS 11).

NS2. Naval History (3)

Objective: Through a study of the influence of sea power upon global history, to stimulate living interest in the Navy and appreciation of the important role of sea power in the past, present and future security of the United States.

Naval History and Sea Power (BuPers Curriculum NS 12).

NS101-A. Naval Weapons (3)

Objective: To afford the student a basic understanding of the principles of naval weapons and their application in control of the seas.

Naval Ordnance and Gunnery, elementary-fire control (BuPers Curriculum NS 21).

NS101-A. Naval Weapons (3)

Continuation of NS 101-A.

Advanced fire-control, radar, anti-submarine warfare, combat information center. (BuPers Curriculum NS 21).

NS151. Naval Operations (3)

Naval Operations, Maneuvering Board, and Communications (BuPers Curriculum NS 31).

NS152. Naval Administration (3)

Objectives: 1. To develop in the prospective junior officer a personal confidence by instilling in him an appreciation of the importance of his place in the naval structure.

2. To examine with him the principles of good personnel management, the elements of military law, and those areas of personal relations pertinent to the naval service.

3. To develop in him a strong sense of responsibility and a loyalty to the idea of service to his country by examining simultaneously the basic reasons and thinking underlying these factors.

4. To prepare the prospective junior officer for integration into a ship's organization as a Junior Division officer.

Shipboard Administrative Procedures, Military Law, Naval Leadership (BuPers Curriculum NS 32).

GENERAL COURSES REQUIRED FOR ALL MIDSHIPMEN

G1-A. English (2)

A complete review of functional English including sentence structure, punctuation, and usage and a practical treatment of English composition—the English language as an instrument indispensable to professional accomplishment. Compo-

sition topics include the theory of communication, characteristics of a factual message, the factual talk, the expanded definition, the objective description, the explanation of a process, the investigation report, the business letter.

G1-B. English (3)

A course in reading, thinking, and writing built around the assignment of reading selections arranged topically, the discussion of these topics, and creative composition developing ideas gained from the reading and discussion. An approach to language as a concomitant of clear and logical thinking.

G11-A—G11-B. Engineering Drawing (1-1)

A general course in engineering drawing meeting the needs of both the deck and engineering curriculums; material covered includes lettering, applied geometry, use of instruments, orthographic projection, freehand and isometric sketching, isometric and oblique drawing, sections, threads and fasteners, dimensioning, piping drawings, and blueprint reading. Practical projects applying to the marine field are encouraged for advanced students.

G121. U. S. Maritime History (2)

A survey of the development of the United States with concentration upon its maritime aspects. This course is designed to meet graduation requirements in American history, institutions and ideals, the United States Constitution, and California state and local government.

G181. Ship's Medical Practice (1)

The practical application of the principles of first aid and the use of the ship's medicine chest at sea; anatomy, shock, unconsciousness, common ills, bleeding, wounds, bandaging, artificial respiration, burns, poisoning, fractures, moving the injured, exposure.

G191. Ship Construction and Damage Control (3)

An introduction to ship's structure; compartmentation of ships, hull piping systems, the principles of buoyancy and stability, inclining experiments, coefficients and rules of mensuration.

DESCRIPTION OF PRACTICAL TRAINING

An important aspect of the educational process of the California Maritime Academy is the coordination of the academic program with practical training on board the *T. S. Golden Bear*. This coordination begins as soon as the midshipman enters the academy and continues until he graduates. Direct personal experience is thus an integral part of the academy's educational program and takes many forms. It follows a planned continuity from the initial, closely supervised tasks of the third classman to the highly technical and virtually independently performed duty assignments of the first classman.

As the midshipman matures and learns, his responsibilities grow, until, on his first class cruise, he performs those duties on the training ship which will be expected of him as a ship's officer on deck or in the engine room. Thus he graduates with a background of experience which is balanced between academic instruction in the classroom and practical training on board ship. Every step in his development has been carefully guided by the members of the faculty, who are his instructors both in the classroom and aboard ship.

DEPARTMENT OF NAVIGATION AND SEAMANSHIP

SEAMANSHIP

Watchstanding

Midshipmen are assigned duties in all Deck Department billets found aboard a ship or station, each such assignment increasing in importance as the midshipman

advances through the academy course. The purpose of this type of training is to develop in the midshipman a sense of responsibility for the security and safety of life and property and so prepare him for the assumption of the responsibilities with which he will be burdened in his future career. In addition, he also becomes familiar with the duty requirements of these assignments and thus is able to train and direct others.

Examples of these duty assignments are listed below:

At the base	*On the cruise*
Midshipman Junior Officer of the Deck	Helmsman
Gangway Quartermaster	Lookout
Midshipman Officer of the Deck	Gangway Quartermaster
	Junior Watch Officer
	Midshipman Officer of the Deck
	Midshipman Watch Officer

Basic Skills and Duties

Practical instruction classes are held on board the ship to familiarize the midshipmen with the duties they will be required to perform aboard ship both during their training and in their careers after graduation. Topics covered in such classes include signals, small boats, mooring, marlinspike seamanship, machinery operation, emergency drills, fire-fighting equipment, and engine room observation.

Special Schools

Fire-Fighting School. Third classmen acquire experience in the operation of all types of marine fire and rescue equipment used in fighting fire aboard ship. This training is provided by the U. S. Naval Fire-Fighting School, Treasure Island, California (16 hours).

Cargo School. Second classmen receive indoctrination in the basic principles of handling cargo aboard ship, including winch driving, hatch tending, rigging, and safety. Students attend the U. S. Naval School, Freight Transportation, Naval Supply Center, Oakland, California (33 hours).

Cruise Notebook

As a bridge between academic instruction in the classroom and practical training aboard ship, midshipmen are assigned written projects to perform during the cruise trimester. Topics assigned include location of fire-fighting equipment, drydocking, ship's compartmentation, rigging, ground tackle, steering gear, displacement problems, safe working load of deck gear, lifeboat launching, fuel consumption, ship handling and maneuvering, and meteorology.

Ship Maintenance

The midshipmen obtain training and experience in the proper maintenance of ship's equipment, rigging, and running gear to insure optimum operational performance for safety of life and property. The student learns to handle paint, tools, tackle, and preservative materials and equipment, and the maintenance of fire-fighting and lifesaving equipment.

NAVIGATION

Basic Skills

Special instruction classes are held on board ship to instruct students in all aspects of practical navigation. Topics covered include charts and publications, navigational instruments and equipment, and compensation of magnetic compasses.

Cruise Navigation

At sea on the training cruise deck midshipmen are assigned to study groups to perform practical assignments in navigation. The culmination of this sequence occurs on the final cruise when the midshipman performs all phases of the navigator's day's work.

Special Schools

Loran School. The midshipman becomes familiar with the theory, operation and minor maintenance of loran equipment at the San Francisco Marine School of the Sperry Gyroscope Company (40 hours).

Gyro School. The student learns the theory, operation and minor maintenance of gyro compass equipment at the San Francisco Marine School of the Sperry Gyroscope Company (80 hours).

Radar School. The student learns to operate and maintain marine navigational radar equipment in instruction carried out at the academy, jointly by faculty and Sperry Gyroscope Company personnel.

DEPARTMENT OF MARINE ENGINEERING

Watchstanding

The propulsion plant of the *Golden Bear* is especially well suited for training. It is a modern, twin screw, turbo electric drive installation of 6,600 shaft horsepower. Engineering midshipmen are assigned duties in all billets necessary for the operation of such a power plant. The assignments increase in importance as the midshipmen advance through the course. This training develops a sense of responsibility for the safety of life and property and the midshipmen to train and direct others. Typical watchstanding assignments are listed below:

At the Base	*On the Cruise*
Midshipman Junior Officer of the Deck	Boat Engineer
Midshipman Officer of the Deck	Fireman
Fireman	Evaporator Operator
Midshipman Engineer	Water Tender
	Oiler
	Electrician
	Midshipman Watch Engineer
	Mishipman Assistant to Chief Engineer

Basic Skills, Shop Work

The academy has two well equipped shops, one ashore and one on the training ship. The shoreside shop has approximately 2,400 square feet of floor space and includes the following equipment: eight lathes, three shapers, one milling machine, two drill presses, one surface grinder, two pedestal grinders, two electric arc welders, one oxygen-acetylene gas welding and cutting outfit, two metal cutting power saws, one gas fired heat treating furnace, one gas fired crucible, one power driven forging hammer and one hydraulic press.

The shipboard shop has even more equipment including a metal spraying outfit used for building up machinery parts such as worn shafts, etc.

In the shoreside shop the midshipmen are taught machine tool operations such as turning to a specified diameter, boring, knurling, taper turning, surface grinding, gear cutting, and shaping. They also are given basic training in electric arc welding, oxygen-acetylene flame cutting and heat treatment of metals. The primary purpose of the shoreside shop training is to give the midshipmen sufficient skill to use the equipment found in the usual shipboard shop and thus be able to supervise and effect necessary repairs.

The work performed in the shipboard shop is of a more advanced nature and consists of carrying out maintenance and alteration projects on turbines, pumps, pipelines, boilers, electric motors, blowers, diesel engines and refrigeration machinery.

Special Schools

Firefighting School (Same as Deck Department).
Gyro School (Same as Deck Department).

Cruise Notebook

Midshipmen are assigned written projects to perform during the cruise time at sea. These include description of drydocking and shipyard work at beginning of cruise, location of firefighting equipment and its use, boiler water testing and operation of boilers, evaporators, auxiliary machinery, and the main propulsion machinery. They also cover the loading of fuel, fuel transfer systems, keeping of engine room logs and records, computing of daily fuel and water consumption, lifeboat launching and operation, and the care of boat engines.

Ship Maintenance

Shipboard maintenance training is carried out under the following divisions: boilers, electrical, auxiliaries, diesel engines and main propulsion under supervision of the same instructors they have had at the base.

Boiler maintenance includes cleaning of the fire and water sides of boilers, overhaul of forced draft blowers, application of hydrostatic tests, overhauling feed pumps and other related boiler auxiliary machinery.

In electrical maintenance, the midshipmen assist in taking insulation tests on main propulsion generators and motors, auxiliary generators, and perform servicing operation on the many smaller auxiliary electric motors throughout the ship. They also conduct routine maintenance and repair on controllers, starters, brush rigging and commutators, motor armatures, and wiring circuits. The ship has both AC and DC electrical equipment which provides experience in both types of power.

Auxiliary maintenance involves work in repacking reciprocating and centrifugal pumps, repairing and replacing worn parts in centrifugal pumps, making up flange joints, renewal of pipe sections, scaling evaporator tubes, and maintenance of heating systems and galley equipment.

Diesel engine operation and maintenance is also an important part of the shipboard training. Repair work, such as grinding valves and renewing piston rings, is performed on the numerous engines aboard the ship.

Main propulsion maintenance work includes lubricating oil purification, and inspection and repair of lubricating oil pumps, main shaft bearings, turbines and motors, condensers, and circulating pumps.

PORTS VISITED BY TRAINING SHIP "GOLDEN BEAR"—1947-1955

United States and Possessions

Alameda, California
Balboa, Canal Zone
Cristobal, Canal Zone
Hilo, Territory Hawaii
Honolulu, Territory Hawaii
Houston, Texas
Lahaina, Territory Hawaii
Long Beach, California
Monterey, California
New Orleans, Louisiana
Oakland, California
Pago Pago, Samoa
Portland, Oregon
St. Thomas, Virgin Islands
San Diego, California
San Francisco, California
San Pedro, California
Santa Barbara, California
Seattle, Washington
Stockton, California
Wilmington, California

Foreign Ports

Acapulco, Mexico
Algiers, Algeria
Callao, Peru
Curacao, Netherlands, West Indies
Funchal, Madeira
Genoa, Italy
Gibraltar
Kingston, Jamaica
Magdalena Bay, Mexico
Manzanillo, Mexico
Marseilles, France
Naples, Italy
Papeete, Tahiti
Piraeus, Greece
San Jose, Guatamala
Valparaiso, Chile
Vancouver, British Columbia
Vera Cruz, Mexico

o

19570 5-55 3M *printed in* CALIFORNIA STATE PRINTING OFFICE