



**Civil Engineer Corps  
Graduate School Handbook**

**Updated April 2014**

**Commander, Navy Personnel Command  
Civil Engineer Corps Career Management Branch  
(PERS-4413)**

Civil Engineer Corps Graduate School Handbook

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# Civil Engineer Corps Graduate School Handbook

## I. Introduction

This handbook provides information and guidance for Civil Engineer Corps (CEC) officers assigned to civilian universities for Navy-funded graduate education. The opportunity to attend graduate school full-time at Navy expense is offered to career motivated CEC officers who demonstrate superior performance and potential to succeed as Navy leaders. It is a significant investment and a valuable benefit to the Navy and for officers' personal and professional development.

If you are reading this as an officer selected to attend graduate school, congratulations! Make the most of this opportunity and the Navy's investment in you.

The information in the following pages will help you prepare to return to the academic environment and represent the Navy well while you are there. You will probably have questions that are not answered by this handbook. Other valuable resources to lean on are the graduate school detailer (PERS-4413E), the CEC detailers webpage, fellow officers who are attending or have completed graduate school and the faculty and staff of the school(s) you have selected.

## II. Program Background

**Purpose:** The purpose of Navy funded graduated education is to equip officers with specialized education required in particular billets. The Navy fully recognizes the morale and retention benefits of graduate education, but these are not the primary purpose of the program, and not what the Navy uses to justify the resources necessary to support the program.

**Subspecialty codes:** The Navy uses subspecialty codes to categorize specialized education and experience. Codes are applied to billets requiring the education and awarded to officers who hold qualifying degrees. The four digit numeric portion of the code represents the specialty area. The final position is a letter code representing the level of education or experience summarized below:

- T – Training billet (graduate education in progress)
- P – Masters level of education
- Q - Masters level of education AND 18 months experience in a P-coded billet

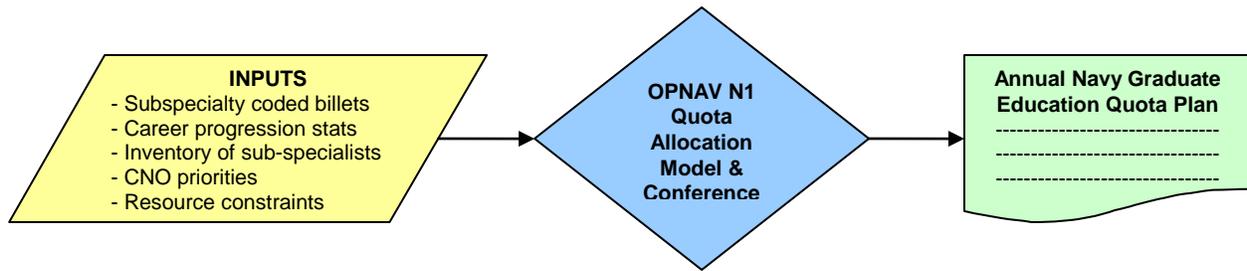
A full explanation of subspecialty codes can be found in the Manual of Navy Officer Manpower and Personnel Classifications. Billet subspecialty coding is requested by individual commands through Budget Submitting Offices, reviewed by Officer Community Managers and approved by OPNAV N1.

**Resource allocation:** Resources to support the Navy graduate education program are limited, and the costs of the program are high. The approximate average cost per CEC student is \$130,000. Salary and benefits make up the bulk of this at approximately \$100,000, with the remainder split between tuition and PCS cost.

OPNAV N1 uses subspecialty coded billets as the starting point for developing the graduate school quota plan each year. Other factors include the inventory of trained officers (those already holding subspecialties), career progression statistics (promotion and loss rates), CNO priorities and budget constraints. Personnel costs (salary and benefits) are programmed for each graduate school quota, and OPNAV N1 closely tracks quota plan execution. In a resource-constrained environment, sustaining CEC quotas in the Navy graduate education program depends on a realistic, credible requirement (subspecialty-coded billets) and solid execution of the quota plan each year (detailing to graduate school). Since quotas are tied to personnel funding, they are allocated by fiscal year. An unused quota cannot be carried over to the next fiscal year.

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## Navy Graduate Education Quota Allocation Process



### Subspecialty coded CEC billets:

<u>Subspecialty Title</u>	<u>Code</u>	<u>Billets</u>
Facilities Management	1101	564
Ocean Engineering	1103	26
Facilities Management – Energy (proposed)	1104	5
Financial Manager	3111	8
Operations Research Analysis	3211	1

### III. Program Oversight

There are several key players in Navy graduate education, as it applies to CEC officers:

**Chief of Naval Operations (N1)** - Sets overall policy for graduate education and approves exceptions or variations to policy. Approves and promulgates the annual quota plan for graduate education. Approves changes to billet sub-specialty coding.

**Naval Postgraduate School (NPS)** - Educates officers to meet subspecialty requirements. The Director for Civilian Institution Programs, Code 031A, oversees programs that are not offered at NPS. Acting for Naval Education and Training Command, NPS funds costs of education at approved civilian institutions.

**Commander, Naval Facilities Engineering Command and Chief of Civil Engineers** - Primary consultant to OPNAV N1 for the Facilities Engineering, Facilities Engineering – Energy, and Ocean Engineering subspecialties (1101P, 1104P, and 1103P).

**Civil Engineer Corps Career Management Branch (PERS-4413) and Community Manager (BUPERS-314)** act for the Chief of Civil Engineers in concert with NPS to approve civilian institutions and curricula for the 1101P, 1104P, and 1103P subspecialties. Primary codes responsible for this effort are PERS-4413E and PERS-4413J. PERS-4413E is the graduate school program manager and creates the quota allocation plan each year. PERS-4413E will coordinate PCS orders for all officers assigned a quota, regardless of rank. Follow on orders after graduation will be negotiated with and written by the respective detailer.

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### IV. Governing Instructions and Internet Resources

OPNAV Instruction 1520.23B is the governing instruction for Navy graduate education. It is available on the DON Directives website:

<http://doni.daps.dla.mil/allinstructions.aspx>

NAVADMIN 195/07 is the most recent modification to policy on graduate education service obligations. A copy is posted on the NPC website.

<http://www.public.navy.mil/bupers-npc/reference/messages/Documents/NAVADMINS/NAV2007/NAV07195.txt>

The Naval Postgraduate School Civilian Institutions Programs Office website includes a welcome aboard package and necessary forms for graduate students attending civilian institutions:

<http://www.nps.edu/Academics/CIVINS/index.html>

NAVPGSCOL Instruction 1520.1J outlines standard procedures for administration of the NPS Civilian Institutions Program. The instruction can be accessed from the above website.

The Civil Engineer Corps Detailer's Website has a tab dedicated to PG School Student information. Please check this page before contacting the detailer. If you need a sponsor to access the portal, use your detailer's e-mail address for fastest approval.

<https://portal.navfac.navy.mil/portal/page/portal/cec/detailers:gradschool>

### V. Selection and Slating for Graduate School

CEC officers are selected for assignment to graduate school based on seniority, completion of career milestones and potential for long-term career service. With the exception of controlled enrollment programs, which are discussed in a separate section, selection for graduate school is made by the graduate school detailer (PERS-4413E) and is based primarily on precedence number and Projected Rotation Date (PRD).

Warfare qualification is required prior to going to graduate school, and your professional registration is highly recommended. Completion of a GWOT deployment and/or GSA assignment is also taken into consideration when building the PG School quota allocation plan. Officers that have met all required career milestones should plan to attend graduate school as a senior Lieutenant or when selected for Lieutenant Commander.

Officers that commission to active duty with a Master's Degree in Engineering or Architecture are assigned an 1101P subspecialty code and are not generally eligible for the Facilities Engineering quotas. These officers can submit for controlled enrollment to the MBA and NPS programs.

### VI. Preliminary Planning

Most schools require the Graduate Record Examination (GRE), and MBA programs normally require the Graduate Management Admission Test (GMAT). The shelf-life of scores depends on the school but generally is limited to two years. The GRE is offered free of charge through Defense Activity for Non-

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traditional Education Support (DANTES). Contact the local Navy College Office for details. Only the general examination is required by most schools. You should confirm specific requirements with your school(s) of choice to ensure you satisfy the specific entrance/application requirements.

Preparing for graduate school requires a careful definition of professional objectives for graduate study. Curriculum Fact Sheets in Appendix B describe the various curricula and options within the curricula. Officers must choose from the approved curricula. Pay particular attention to the Educational Skill Requirements (ESR) as these explain what a program should contain. Terminology may differ among the numerous approved schools. If in doubt about the acceptability of your desired program of study, talk to the graduate school detailer (PERS-4413E).

### VII. Choosing a School

It is beneficial to select several schools and do preliminary research into the programs they offer more than a year before assignment to graduate school. Once selected for assignment to graduate school, work with PERS-4413E to determine a primary and secondary school prior to submitting applications to either school.

In the fiscally constrained environment you will need to work with PERS-4413E to determine a low cost PCS and low cost tuition school, they often will not be the same. Officers should plan to attend that school, and if funds are available, alternatives will be considered. It is recommended that officers try to fill billets in regions where they would like to attend graduate school first, because follow-on tours will not be negotiated with grad school orders.

Clearly indicate on your applications that you are a Navy-sponsored student so that the school knows that you do not require financial aid. Keep the graduate school detailer (PERS-4413E) informed of the schools to which you apply and the progress of your applications.

Appendix C lists approved civilian universities. There are additional requirements for assignment to several schools on the approved list:

- (1) Controlled Enrollment schools (Stanford and MIT) are discussed in a later section of the handbook.
- (2) To be assigned to the University of Hawaii, you must be currently stationed in Hawaii.

When selecting a program, be certain that you understand the school's degree requirements, and conditions or prerequisites for admission. Some universities require a thesis or major engineering report, while others only require course work. This should be a consideration in selecting a school.

The timelines allowed by the Navy are aggressive compared to the average timeline for graduate students at many universities. Pay particular attention to course schedules and discuss the Navy's required timeline with faculty advisors when crafting your Education Plan. All programs of study are limited to 12 months for completion except the urban planning, NPS Financial Management, and Ocean Facilities programs.

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### VIII. Non-approved Schools

The CEC maintains a list of approved schools because not all civilian schools are compatible with Navy requirements. Schools are on the approved list because they provide quality programs that can be completed within the Navy's timeline and budget. Attending a non-approved school represents higher risk of not completing the program and results in additional administrative cost to the Navy.

When unique circumstances warrant assignment to a non-approved school, there is a process to request one-time approval to attend. Requests to attend non-approved schools must be submitted to OPNAV (N131) via Navy Personnel Command PERS-4413E and Naval Postgraduate School Code 031A. The request must demonstrate that the program meets ESRs for an approved curriculum and can be completed within the required timeline with tuition and PCS cost comparable to schools on the approved list (excluding controlled enrollment schools). The request should include an Education Plan that fulfills all ESRs for the chosen curriculum; copies of all undergraduate and any graduate transcripts; supporting documentation from the university (i.e. catalog excerpts, letter from the department validating course schedule and ESR fulfillment, etc.); and a cost comparison between the school of interest and at least two other institutions listed in Appendix C, comparing tuition and PCS costs. Approvals will be based primarily on the benefit to the Navy.

Officers applying to a non-approved school MUST also apply to an alternate school from the approved list and be ready to attend one of those if the request to attend a non-approved school is denied.

### IX. Approved Curricula

<u>Subspecialty/Option</u>	<u>Code</u>	<u>Curriculum</u>	<u>Option</u>
Civil Engineering, Construction Option	1101P	470	470A
Civil Engineering, Environmental Option	1101P	470	470B
Civil Engineering, Geotechnical/Soils Option	1101P	470	470C
Civil Engineering, Public Works Option	1101P	470	470D
Civil Engineering, Structural Option	1101P	470	470E
Civil Engr., Urban, Regional or City Planning Option	1101P	470	470F
Facilities Financial Program Management	1101P	470	470G
Engineering Management	1101P	470	470H
Architecture and Urban Design	1101P	470	470I
Electrical Engineering, Shore Facilities	1101P	471	-
Mechanical Engineering, Shore Facilities	1101P	473	473A
Facility Management, Energy	1101P	473	473B
Ocean Engineering	1103P	472	-
NPS Financial Management - Defense/Energy		837/838	-
NPS mechanical Engineering, Shore Facilities	1101P	563	

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### X. Controlled Enrollment Programs

**Application Procedures:** Officers may request permission to attend the following Controlled Enrollment schools and programs:

<u>School/Program</u>	<u>FY Quotas</u>
Stanford, MIT, Carnegie Mellon	2
MBA (12-mo)	3
NPS Financial Management	3
NPS Mechanical Engineering	2
Urban Planning	2

Officers request enrollment by submitting an electronic request package to Navy Personnel Command (PERS-4413). Templates for the request letter and endorsement are included in Appendix B, however The Navy Correspondence Manual is a great resource for proper format.

Your package shall include the following items:

- Official request letter
- Commanding Officer endorsement
- Transcripts for all undergraduate and any graduate study completed
- GRE Score Report and APC calculation
- Document outlining application process and timeline to ensure Officer understand requirements
- Additional letters of recommendation beyond the CO endorsement are allowed, but not required

**The package must reach PERS-4413 by 01 August for school starting the following academic year.**

Selections are made by a board that reviews professional performance, the letter of objectives, and academic ability. Sustained superior performance is the largest single factor in selection of officers for controlled enrollment schools and programs, along with demonstrated academic ability to succeed in the program.

**Stanford/MIT/Carnegie Mellon Technical degrees:** Attendance at Stanford University, Carnegie Mellon, and Massachusetts Institute of Technology (M.I.T.) is limited to two officers per year due to the high cost of tuition. (Fall start only).

Additional officers may be allowed to attend controlled enrollment schools if able to obtain grants or fellowships that make up the difference between the Navy's per quota tuition budget and actual tuition cost. The school and not a third party must offer these grants or fellowships. Please check with the Graduate School Detailer early if you desire to pursue this option.

**Facilities Financial Program Management:** The Facilities Financial Program Management option (Curriculum 470G) focuses on the growing importance of privatization and joint ventures between the Government and private businesses. The 1101 sub-specialty is met by completing an MBA program with construction engineering, public works or real estate electives. Up to three officers per year may be selected for this program.

Officers applying for this program must be professionally registered (PE or RA).

The duration for the MBA program is limited to 12 months. The University of Florida and University of Rhode Island have 12-month programs that are approved. Others will be considered based on the provisions outlined in Section VIII. The 18-24 month MBA programs are no longer offered as options for the Civil Engineer Corps.

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**Financial Management, Naval Post Graduate School (NPS):** The Financial Management (Defense Focus 837, and Energy Focus 838) curriculums prepares Naval officers for business and financial positions within the Department of Defense. Up to three officer are selected each year to attend the 18-month program. An Academic Proficiency Code (APC) of 345 is required for acceptance. An APC can be requested via the NPS website and should be included in your controlled enrollment request.

**Urban, Regional or City Planning:** Urban, Regional and City Planning programs provide important foundations for shore facilities management billet requirements across NAVFAC and is generally reserved for architects, however engineers may also apply. Up to two officers per year may be selected for this program. Officers must confirm with the desired school of study that the degree can be completed within the timeframe allowed. The maximum duration is 18-months.

### **XI. Orders to Graduate School**

When you receive acceptance (or rejection) letters, send copies to the graduate school detailer (PERS-4413E) so that PCS orders can be drafted. Your orders will direct that you report to the Commanding Officer of the Naval Reserve Officer Training Corps (NROTC) Unit or other local Navy command. Send a traditional letter of introduction to your new Commanding Officer. He/she often can provide valuable information about the area. You will receive a Not Observed Fitness Report while in school.

The orders will have you report not later than the registration date for the school, with detachment month dependent on relief timing. Once you are checked aboard school and have submitted your signed Education Plan, submit preferences for your next duty station to your detailer.

Be advised that participation in fully or partially funded graduate education incurs a three year service obligation. NAVADMIN 195/07 applies.

### **XII. Leave**

The academic calendar in graduate school provides ample opportunity to take leave. Officers graduating in the Spring or Summer should not expect to take much leave during the PCS move from graduate school. Coordinate leave with your administrative chain of command while in a student status.

### **XIII. Administrative Requirements While in School**

Download the NPS Civilian Institutions Welcome Aboard package and NAVPGSCOLINST 1520.1J from the NPS website. Submit the required forms directly to NPS, with the exception of the Education Plan.

The Education Plan (EP) form is submitted to PERS-4413J for approval, not directly to the NPS Civilian Institutions Office (Code 031A). This is due to the technical nature of the ESRs in our curricula. PERS-4413J will forward approved EPs to NPS Code 031A.

Please do not delay in submitting the Electronic Funds Transfer form that NPS requires in order to pay your textbook stipend. They process EFT requests as a batch and your delayed submission will hold up payment for other officers.

NPS Code 031A also requires that each term you provide, within 10 days after registration, a listing of all courses for which you are registered. You must provide a copy of your grade report to the same office within 30 days of the end of each term. These documents are essential to ensuring that the Navy is properly billed, and that you are making satisfactory progress.

Upon reporting to graduate school, notify the graduate school detailer (PERS-4413E) and the NPS Civilian Institutions Office (Code 031A) of your home phone number and any changes to your e-mail address.

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### XIV. Education Plans

Your Education Plan (EP) provides your plan for completing a master's degree in an approved curriculum in the time allotted. In addition, it serves to document the courses you plan to take so NPS Code 031A can verify that the Navy is being billed correctly. A subspecialty code is earned through fulfillment of all Educational Skill Requirements (ESRs) in your chosen curriculum/option. ESRs are listed on the curriculum fact sheets in Appendix B. The EP form is provided in fillable PDF format on the CEC Detailer's PG School web page (see Section IV above for web address).

#### General EP guidance:

- Do not put your SSN on the form, even though there is a block for it.
- Do list a good phone number, address and email on every EP submission.
- Initial and revised EPs must be approved and signed by your graduate school advisor to verify that the school agrees your plan is feasible. The advisor's signature may be omitted on the final EP.
- Your EP must meet all ESRs for the curriculum/option. If you have questions about ESRs, contact PERS-4413J and/or PERS-4413E.
- Many schools do not publish course catalogs for the full year. Nevertheless, you always need to have a plan that gets you to graduate on time. Ask your advisor what classes are normally offered in a given semester. Schools don't change radically from year to year. If/when courses change you can revise your plan. You may list alternate classes.
- Determine if the course is a residence (R) or Distant Learning (DL) course. Per OPNAV instruction no more than 50% DL courses can be taken per period, preferable no more than 25%.
- List all ESRs fulfilled by a class.
- List an ESR with every class that fulfills it, not just once.
- Until you select a thesis or major report topic, indicate "TBD" on the form. When you select a topic, submit a revised EP.
- Electives should be somehow relevant to your overall program and the Navy's needs. Our definition of "relevant" is broad, but be reasonable.
- Fitness courses are fine, but you must pay any associated additional fees.
- Submit EPs by email in PDF format to PERS-4413J.
- You must maintain full time student status as dictated by the university. This can be less for shorter summer sessions. Discuss with PERS-4413E if you have questions.
- The credits for thesis or major reports may not exceed 20% of the total degree credits or 50% of any semester. At least one class must be taken during the summer in addition to thesis/major report credits.

#### Initial EPs:

- Submit your signed initial EP as soon as practical, but NLT 30 days prior to class start date if possible.

#### Revised EPs:

- Submit a revised EP whenever you make changes to your planned classes. NPS will not pay your bill if the classes on your bill do not match the approved EP on file, and at many universities this can result in dis-enrollment from all current classes.
- Note any changes on revised EPs with asterisks.

## **XV. Thesis and Major Project Reports**

Get started early on your thesis or major project report so that you do not run the risk of having to leave school without finishing the work. Most thesis programs are very hard to complete in 12 months unless you have a research topic identified and approved by your advisor early in the first semester/quarter.

Schools have differing requirements for a thesis, major project report, or final comprehensive exam to obtain a degree. The thesis/major report topic must extend your knowledge in a particular technical area. When practical, you may choose to research a subject directly related to specific Navy field, but this is not required. If you select a Navy topic, remember that you will have to gather data from your counterparts in NAVFAC or the Seabees. Be considerate and realistic as you generate the data call.

You may find that more resources/data will be available if you select a project or research topic that is part of the larger body of work for a professor at your school.

Send a copy of your thesis or major report to NPS Code 031A and one to CECOS for inclusion in the reference library. It is not necessary to send the thesis to the detailer.

If you have expenses for a bound thesis, you may be reimbursed per NAVPGSCOLINST 1520.1 Series. Reimbursement is dependent on available funding for this program. Costs are limited to materials and services in connection with thesis reproduction, collating, stapling, and binding. Contact NPS Code 031A for details regarding current cost reimbursement limitations.

## **XVI. A Note on Professional Registration**

The Chief of Civil Engineers has given considerable emphasis to the topic of professional registration, and graduate school presents a golden opportunity to prepare for and pass the PE or RA examinations. Good counseling and review sessions are often available on campus. If you are not currently registered, you should plan on taking your registration exams while in graduate school. Reimbursement for PE/RA preparation classes can be requested via NAVFACINST 12400-1.

## **XVII. Departing Graduate School**

Your detachment from graduate school will normally be specified as the month in which you complete all required classes and examinations. You must request that one official final transcript, with degree conferred, be sent to NPS Code 031A.

NPS Code 031A will validate your transcript and submit it to PERS-45E for inclusion in the officer record. Do not send a transcript to your detailer, PERS-45E will no longer accept transcripts from detailers. Until you send this transcript, your record will reflect a "T" or "S" sub-specialty code (such as 1101T), which indicates you have not completed your graduate education. Please check your OSR one to three months after submitting the transcript to ensure the master's degree is reflected in your record to avoid future issues.

The importance of finishing all requirements for graduation prior to departing school cannot be over-emphasized. This includes all required work for your major project or thesis. Notify the detailer immediately if you anticipate any problems.

A formal feedback letter is required to be sent to PERS-4413E with copy to NPS 031A per NAVPGSCOLINST 1520.1 Series. See current instruction for sample letter.

## XVIII. Other Helpful Information

### Addresses and Phone Numbers:

#### **Navy Personnel Command**

ATTN: PERS-4413E (or PERS-4413J)  
5720 Integrity Drive  
Millington, TN 38054-4413  
Fax: (901)874-2681, DSN 882-2681  
PERS-4413E: (901) 874-4035, DSN 882-4035  
PERS-4413J: (901) 874-3998, DSN 882-3998  
e-mail: [james.p.dean@navy.mil](mailto:james.p.dean@navy.mil)

Civilian Institution Programs

#### **Naval Postgraduate School (Code 031A)**

1 University Circle, Room HE-046  
Monterey, CA 93943-5033  
(831) 656-2319 DSN 756-2319  
FAX (831) 656-1014  
<http://www.nps.edu/academics/civins/>  
e-mail: [civins@nps.edu](mailto:civins@nps.edu)

Commanding Officer (Code C35)

#### **Naval School, Civil Engineer Corps Officers**

Naval Construction Battalion Center  
Port Hueneme, CA 93043

**Application Fees** – After reporting to graduate school, you may claim reimbursement for application costs (fees and transcript orders) for up to three universities. See NAVPGSCOLINST 1520.1 Series for procedures to submit a claim. Contact NPS Code 031A if you have questions.

**Clothing and Uniforms** - Officers on a DUINS tour at a civilian university are authorized to wear appropriate civilian attire while attending classes. Such clothing will be in good taste and will meet the standards expected of officers. The appropriate uniform will be worn when visiting military installations on official business and at other times when directed by competent authority.

**Duty Preferences** - Since detailing often begins nine to twelve months prior to your PRD, you may find that you are being detailed out of graduate school just as you are starting to get settled. Be sure to submit updated duty preferences immediately after reporting to school. Include home telephone number(s) and email address(es) to ensure continued communication.

**Fitness Reports** - Your Commanding Officer will complete fitness reports on you according to the normal schedule. DUINS fitness reports are “Not Observed” unless the CO feels the need to comment on your performance. As a naval officer, you are expected to maintain the same standards of conduct and appearance that would be expected in any other duty assignment. If difficulties in these areas should arise, or gross academic negligence is evident, the Commanding Officer has full latitude to reflect these problems in an appropriate fitness report.

**Household Goods** - If you foresee that your quarters at graduate school will not accommodate all of your household goods, you are authorized to place some of them in non-temporary storage (NTS). Contact your local Personal Property Office or refer to the Joint Federal Travel Regulations (JFTR) specific

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information. If you choose to store HHG, be sure to notify your detailer when negotiating follow-on orders to ensure proper accounting data.

**Leave Policy** - The leave policy will be set by your Commanding Officer. Except for emergencies, leave is not typically authorized while classes are in session.

**Mailing Address** - Official mailing address at graduate school is the address of the activity (NROTC Unit, Naval activity, etc.) to which you are assigned. Review your orders as soon as they are issued and notify the grad school detailer if there are any issues.

**Pay and Allowances** - You receive normal pay and allowances while in DUINS status. Textbooks are not reimbursable. Refer to NAVPGSCCOLINST 1520.1J for all reimbursable and non-reimbursable expenses.

**Healthcare** – Since a number of the approved schools are not near major military installations, medical coverage may be provided by TRICARE Prime Remote. If you or a family member has particular medical needs that might be affected by this, contact TRICARE for more information.

**Recruiting** - You represent the Navy and the Civil Engineer Corps on campus. If you talk to students who may be interested in becoming a CEC officer, please refer them to a CEC Accessions Officer. Up-to-date contact info can be found on the CEC Detailer and Community Manager website.

An Accessions Officer may contact you to request assistance with an interview, career fair or a visit to your campus. You are expected to assist them if asked, but they will not make unreasonable demands on your time.

**Tuition and Fees** - NPS Code 031A establishes procurement contracts with each graduate school to pay for your basic tuition and fees. Please note that distant learning (DL) classes often have associated fees with them. Please make sure NPS Code 031A is aware of any DL fees associated with your tuition. Be sure that the Navy is charged the appropriate tuition rate based on your legal state of residence, agreement with NPS, or military status. Because the Navy provides medical and dental support to you, you must ensure a similar fee is not included on your bill. Failure to do so may result in you being responsible for that cost. Also, request a reduction of the tuition charged if you have been approved to take less than a full course load.

If, as part of the application or acceptance process, you were required to make a tuition deposit, reimbursement must be claimed through the university refund process. Some universities, however, will apply the tuition deposit towards the next terms' tuition. If this is the case, you may submit a claim for reimbursement along with a statement from the university that the deposit will be applied toward the tuition. If you have any problems regarding tuition payments, contact NPS Code 031A.

**Civil Engineer Corps Graduate School Handbook  
Appendix A – Checklist for Graduate School**

**Appendix A**

**Checklist for Graduate School**

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Appendix A – Checklist for Graduate School**

**Checklist for Graduate School**

	<b>Time Frame</b>	<b>Action Item</b>	<b>Cognizance</b>
1	24-12 months prior to assignment	Take Graduate Record Examination (GRE) and forward results to graduate schools. See Navy College for reimbursement through DANTES program.	CEC officer
2	12-9 months or more prior to assignment	Obtain program information and application forms from schools.	CEC officer
3	9 months prior to assignment	Contact CEC officer indicating tentative assignment to school. Conduct budget and cost analysis Confirm intent to start formal application process.	PERS-4413E
4	9-6 months prior to assignment	Submit applications. Keep detailer informed of application status. Draft rough education plans to ensure program can be completed within allotted time.	CEC officer
5	Upon receipt of acceptance letters	Forward copies of letters to PERS-4413E (including any rejection letters) AS THEY ARRIVE.	CEC officer
6	6 months prior to assignment or upon receipt of acceptance letter	Conduct budget and cost analysis. Draft orders to approved graduate school.	PERS-4413E
7	Upon receipt of orders	Send letter of introduction to <a href="mailto:civins@nps.edu">civins@nps.edu</a> and to Commanding Officer/Officer in Charge informing of arrival date and plans. Draft final education plan for advisor review.	CEC officer
8	No later than 30 days after reporting to grad school	Submit signed Education Plan to PERS-4413J for technical review and approval.	CEC officer
9	After reporting to graduate school	Notify your detailer of any change to phone number and e-mail address.	CEC officer
10	At beginning of each academic term	Submit education plan with final course list to PERS-4413J.	CEC officer
11	Upon receipt of Education Plan	Review Education Plan and forward to NPS	PERS-4413J
12	Anytime course changes occur	Submit revised Education Plan.	CEC officer
13	12-9 months prior to PRD	Submit updated duty preferences to your detailer.	CEC officer
14	Upon completion	Submit official/final transcripts and a copy of thesis/major report to NPS. Submit one copy of thesis/major report to CECOS.	CEC officer
15	4 months after transcript submission	Check record to ensure that degree and subspecialty code has been entered. Notify Detail Office of any discrepancies.	CEC officer

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Appendix B – Controlled Enrollment Requests**

**Appendix B**

**Controlled Enrollment Requests**

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**Controlled Enrollment Request Letter Template**

13 JUL 14

From: Lieutenant Model T. Student, CEC, USN, xxx-xx-2222/5100  
To: Commander, Naval Personal Command (PERS-4413E)  
Via: Commander, My Current Command (Office Code)

Subj: REQUEST FY15 GRADUATE SCHOOL CONTROLLED ENROLLMENT QUOTA

Ref: (a) Civil Engineer Corps Graduate School Handbook

Encl: (1) Copy of College Transcript(s)  
(2) Copy of Graduate School Application(s) process M.I.T.,  
Stanford, Univ. Illinois  
(3) GRE Exam Score Report

1. Per reference (a), I respectfully request consideration for controlled enrollment at Massachusetts Institute of Technology with an intended course of study in ...
2. Graduate study is an important step in the career progression for me personally and professionally. I have always...
3. My desire to perform at the highest level is evident in the supporting documentation...
4. I thank you for considering me for the Civil Engineer Corps controlled enrollment program. I would be honored ...

M. T. STUDENT  
LT, CEC, USN

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**Sample Endorsement Letter for Controlled Enrollment Request**

1520  
Code/Ser  
13 Jul 2014

FIRST ENDORSEMENT on LT Model T. Student, CEC, USN, xxx-xx-  
2222/5100 ltr of 13 Jul 14

From: Commander, Your Current Command (Office Code)  
To: Commander, Navy Personnel Command (PERS 4413E)

Subj: REQUEST FY15 GRADUATE SCHOOL CONTROLLED ENROLLMENT QUOTA

1. Lieutenant Student has my strongest personal recommendation and endorsement to a controlled enrollment program..
2. Among our outstanding CEC Community, I can think of no better candidate for this program..
3. Selecting LT Student now for controlled enrollment would be a sound investment in the future leadership of the Civil Engineer Corps..

I. M. BOSSMAN

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Appendix C –Curriculum Fact Sheets**

**Appendix C**

**Curriculum Fact Sheets**

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**Civil Engineering, Construction Option (470A)**

**Subspecialty Obtainable:** 1101P - Facilities Engineering

**Applicable Designator:** 5100

**Major Code:** 4754

**Educational Background:** ABET accredited baccalaureate degree in civil engineering or other ABET accredited engineering degree if acceptable to the civilian institution. Officers with a first professional degree in architecture are considered on a case-by-case basis only if they have a strong undergraduate background in technical subjects.

**Degree Length:** 9 - 12 months.

**Educational Skill Requirements:**

1. Working knowledge of engineering terms common to construction operations, equipment and material procurement, maintenance, estimating and bidding techniques, work scheduling, quality control techniques, resource allocation, common construction practices, construction organizations, and financing. (General Engineering)
2. Familiarity with basic elements of a contract, types of specifications, general provisions, resolution of legal disputes, and negotiating strategies. (Construction Contracting)
3. Working knowledge of construction equipment to include selection and performance, estimating productivity, and equipment economics. (Construction Estimating and Quality Control)
4. Working knowledge of the physical, chemical, and mechanical properties of construction materials and their non-destructive testing including metals, concrete, timber, asphalt, and soil. (Materials)
5. At least one course which extends knowledge in any of the classical engineering disciplines. Can be in any technical area, such as structural engineering, pavement design, environmental engineering, soils analysis or design, hydraulics, hydrology, mechanical or electrical engineering. (Classic Engineering)
- 6.. Familiarity with solid waste management and water/wastewater distribution, treatment, and disposal systems. (Wastewater Management)
7. Knowledge of problems meeting the growing energy demand. Selection of energy sources and their corresponding advantages and disadvantages. (Energy Demand and Sources)
8. Basic understanding of data processing and computer techniques for application to engineering problems. (Data Processing)
9. Working knowledge of and ability to apply business and financial accounting principles. (Accounting)
10. Proficiency in oral and written communications and ability to identify, research, and recommend alternatives to various engineering problems for presentation to both technical and non-technical managers. (Communication – Oral and Written)
11. If a thesis or major report is required for the degree, the topic selected must be applicable to construction engineering and management problems found in the Navy facilities business or extends knowledge in a particular technical engineering area. (Thesis/Project)

**Note:** Construction Engineering option must be satisfied by courses that address the technical and administrative aspects of the construction process.

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**Civil Engineering, Environmental Option (470B)**

**Subspecialty Obtainable:** 1101P - Facilities Engineering

**Applicable Designator:** 5100

**Major Code:** 4752

**Educational Background:** ABET accredited baccalaureate degree in civil, environmental or chemical engineering.

**Degree length:** 9 - 12 months.

**Educational Skill Requirements:**

1. Knowledge of environmental management and planning processes including political and economic considerations. Introduction to practical procedures and decisions that public servants, lawyers, engineers and citizens confront with regard to the environmental option. (Ethics)
2. Understanding of physical and chemical unit processes used for treatment of potable water and wastewater. Ability to interpret water quality/quantity data and knowledge of Federal, State and local requirements to design appropriate treatment and supply systems to meet Navy needs. (Water Quality)
3. Understanding of the effect of pollutants on the ecology and quality of waterways, including an introduction to computer transport modeling techniques. (Water Ecology)
4. Knowledge of fundamental aspects of microbiology and biochemistry as related to effects on water and soil environments, including an introduction to the concept of natural treatment systems and bioengineering for pollution control. (Biochemistry in Pollution Control)
5. Ability to understand and apply chemical principles to aqueous and gas phase kinetics that permit pollutant capture, transformation or destruction in pollution control systems. (Chemistry in Pollution Control)
6. Working knowledge of solid and hazardous waste disposal concepts and methods to minimize/recover/recycle these wastes. (Hazardous Waste Disposal)
7. Understanding of water transport in open channels and closed piping systems, as well as groundwater flow and monitoring. (Fluids)
8. Introduction to legal and regulatory processes that apply to environmental protection, including basic statutes and the role of the Federal, State and local government in environmental protection. (Environmental Law)
9. Knowledge of problems meeting the growing energy demand. Selection of energy sources and their corresponding advantages and disadvantages. (Energy Demand and Sources)
10. Basic understanding of data processing and computer techniques for application to engineering problems. (Data Processing)
11. Working knowledge of and ability to apply business and financial accounting principles. (Accounting)
12. Proficiency in oral and written communications and ability to identify, research, and recommend alternatives to various engineering problems for presentation to both technical and non-technical managers. (Communication)
13. If a thesis or major report is required for the degree, the topic selected must be applicable to environmental problems found in the Navy or extends knowledge in a particular technical engineering area. (Thesis/Report)

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**Civil Engineering, Geotechnical/Soils Option (470C)**

**Subspecialty Obtainable:** 1101P - Facilities Engineering

**Applicable Designator:** 5100

**Major Code:** 4745

**Educational Background:** ABET accredited baccalaureate degree in civil engineering or other ABET accredited engineering degree if acceptable to the civilian institution.

**Degree length:** 9 - 12 months.

**Educational Skill Requirements:**

1. Working knowledge of soil and rock as a construction material for building foundations, embankments, dams, roads, earth retaining structures, channels and waterfront structures, including bulkheads, dry-docks and piers. (General Geotech)
2. Ability to apply theoretical principles of soil mechanics to geotechnical engineering problems related to deep and shallow foundations, retaining walls, slopes, braced cuts, embankments, tunnels, compaction of soil, and solid waste disposal. (Soil Mechanics)
3. Understanding of the properties of pavement components, design of flexible and rigid pavements, pavement evaluation, and design tests. (Pavement Design)
4. Basic understanding of the techniques and limitations of laboratory and field testing including tests for soil and rock properties, capacity of foundations, and an understanding of field testing data for changes in site conditions that may change design. (Field Testing)
5. Understanding of soil properties and characteristics, and physical and chemical factors that affect engineering soil properties. (Soil Characteristics)
6. Understanding of techniques for the dynamic analysis of soils and foundations related to vibratory and seismic forces. (Dynamic Analysis)
7. Understanding of geotechnical engineering solutions and designs that relate to settlement and heave problems; possible engineering solutions or field testing that may result. (Settlement)
8. Understanding of principles and techniques involved in terrain evaluation by observable geologic surface features, vegetation or drainage patterns, aerial photography or relief mapping media. (Geology)
9. Understanding of principles and properties of groundwater seepage and porous media as related to engineering properties of soil and rock that affect engineering and environmental considerations. (Groundwater)
10. Understanding of engineering solutions of synthetic materials in design and construction applications to strengthen soils or provide seepage control. (Synthetic Materials)
11. Knowledge of problems meeting the growing energy demand. Selection of energy sources and their corresponding advantages and disadvantages. (Energy Demand and Sources)
12. Basic understanding of data processing and computer techniques for application to engineering problems. (Data Processing)
13. Working knowledge of and ability to apply business and financial accounting principles. (Accounting)
14. Proficiency in oral and written communications and ability to identify, research, and recommend alternatives to various engineering problems for presentation to both technical and non-technical managers. (Communications)
15. If a thesis or major report is required for the degree, the topic selected must be applicable to soils/geotechnical problems found in the Navy or extends knowledge in a particular technical engineering area. (Thesis/Report)

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**Civil Engineering, Public Works Option (470D)**

**Subspecialty Obtainable:** 1101P - Facilities Engineering

**Applicable Designator:** 5100

**Major Code:** 4757

**Educational Background:** ABET accredited baccalaureate degree in civil engineering or other ABET accredited engineering degree if acceptable to the civilian institution.

**Degree Length:** 9 - 12 months.

**Educational Skill Requirements:**

1. Understand the principles of and be able to organize, plan, direct, coordinate, and control activities where people, money, and materials are efficiently and economically combined to provide effective engineering and facilities support services. Implicit is an understanding of the technical and managerial instruments available for proposing and implementing objectives, policies, and programs; policy analysis, program planning, and budgeting; accounting, evaluation, and control; and manpower planning. (Organizational Management)
2. Familiarity with solid waste management and water/wastewater distribution, treatment, and disposal systems. (Wastewater Treatment)
3. General knowledge of systems analysis problems solving models, network analysis, benefit-cost analysis, and the role of systems analysis in public works decision making. (Public Works Analysis)
4. Working knowledge of utilities, including generation, distribution, and conservation techniques. (Utilities)
5. Understanding of labor relations and collective bargaining. (Labor Relations)
6. Understanding of basic fundamentals of urban planning, effective land use development, and general real estate concepts. (Urban Planning)
7. Basic understanding of facility energy conservation techniques and environmental regulatory concepts. (Facilities Energy Conservation)
8. At least one course which extends knowledge in any of the classical engineering disciplines. Course(s) can be in any technical area such as structural engineering, pavement design, environmental engineering, transportation design and analysis, soils analysis or design, hydraulics, hydrology, mechanical engineering or electrical engineering. (Technical Engineering)
9. Knowledge of problems meeting the growing energy demand. Selection of energy sources and their corresponding advantages and disadvantages. (Energy Demand and Sources)
10. Basic understanding of data processing and computer techniques for application to engineering problems. (Data Processing)
11. Working knowledge of and ability to apply business and financial accounting principles. (Accounting)
12. Proficiency in oral and written communications and ability to identify, research, and recommend alternatives to various engineering problems for presentation to both technical and non-technical managers. (Communications)
13. If a thesis or major report is required for the degree, the topic selected must be applicable to public works engineering problems found in the Navy facilities business or extends knowledge in a particular technical engineering area. (Thesis/Report)

Note: The requirements for the public works engineering option should be satisfied by courses which emphasize the technical and administrative aspects of public works. Courses in the school of engineering should generally be taken in lieu of the more theoretical courses typically found in business administration curricula.

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**Civil Engineering, Structural Option (470E)**

**Subspecialty obtainable:** 1101P - Facilities Engineering

**Applicable designator:** 5100

**Major Code:** 4753

**Educational background:** ABET accredited baccalaureate degree in civil or structural engineering.

**Degree length:** 9 - 12 months.

**Educational Skill Requirements:**

1. In-depth knowledge of construction materials, particularly reinforced concrete and steel, and their performance characteristics including tensile strength, yield strength, modulus of elasticity, ductility, and toughness. (General Structures)
2. Working knowledge of matrix analysis techniques and the finite element method (FEM) of structural analysis; including capability to develop and provide design criteria for computer input and interpret the output in terms of magnitude and distribution of internal forces including moments and shears. (Finite Element Analysis)
3. Capability to establish the limit of structural elastic response and its relation to the failure load and extend the analysis into the inelastic range through an understanding of plastic analysis or ultimate loading principles. (Steel/Concrete/Timber Design)
4. Basic understanding of the probabilistic responses of various structures to seismic accelerations. Understanding of single and multi degrees of freedom in seismic modeling. (Seismic Response)
5. Sound foundation in the principles, techniques and methods of engineering and the related mathematical and physical sciences including the physical and chemical properties of engineering materials and the uses, limits, and benefits of these materials. (Foundation Design)
6. Knowledge of problems meeting the growing energy demand. Selection of energy sources and their corresponding advantages and disadvantages. (Energy Demand and Sources)
7. Basic understanding of data processing and computer techniques for application to engineering problems. (Data Processing)
8. Working knowledge of and ability to apply business and financial accounting principles. (Accounting)
9. Proficiency in oral and written communications and ability to identify, research, and recommend alternatives to various engineering problems for presentation to both technical and non-technical managers. (Communications)
10. If a thesis or major report is required for the degree, the topic selected must be applicable to structural problems found in the Navy or extends knowledge in a particular technical engineering area often relied upon by the Navy. (Thesis/Report)

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**Civil Engineering, Urban, Regional or City Planning Option (470F)**

**Subspecialty Obtainable:** 1101P - Facilities Engineering

**Applicable Designator:** 5100

**Major Code:** 4750

**Educational Background:** First professional NAAB accredited degree in architecture or an ABET accredited engineering degree if acceptable to the civilian institution.

**Degree length:** 15 - 18 months.

**Educational Skill Requirements:**

1. Understanding of the demographic and socio-economic systems which make up a location including population characteristics and monitoring techniques, employment characteristics, revenue resources, and cultural factors. (Urban Design)
2. Basic understanding of political systems, including municipal organizations and services; multi-jurisdictional coordination; federal, state and regional policy, programs and support; and capital improvement programs. (Public Policy)
3. Working knowledge of land use planning including considerations of zoning regulations and laws; environmental concerns such as aesthetics, development density, open space, protection and preservation of scarce resources and cultural artifacts; and factors impacting housing, transportation, utilities, and waste treatment/disposal systems. (Zoning Regulations)
4. Understanding and ability to incorporate economic dynamics in planning and design. (Economic Analysis)
5. Working and practical knowledge of the development, financing, and execution of capital improvement programs. (Capital Finance)
6. Basic knowledge of architectural, landscape and urban design. (Architecture and Urban Design)
7. Introductory knowledge of physical science including geology, topology, meteorology, climatology, and hydrology. Understanding of bio-systems including terrestrial and marine ecosystems and habitat associations. (Terrestrial Systems)
8. Knowledge of problems meeting the growing energy demand. Selection of energy sources and their corresponding advantages and disadvantages. (Energy Demand and Sources)
9. Basic understanding of data processing and computer techniques for application to engineering problems. (Data Processing)
10. Working knowledge of and ability to apply business and financial accounting principles. (Accounting)
11. Proficiency in oral and written communications and ability to identify, research, and recommend alternatives to various engineering problems for presentation to both technical and non-technical managers. (Communications)
12. If a thesis or major report is required for the degree, the topic selected must be applicable to planning issues found in the Navy. (Thesis/Report)

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**Facilities Financial Program Management (470G)**

**Subspecialty Obtainable:** 1101P - Facilities Engineering or 3000P if member already holds 1101P

**Applicable Designator:** 5100

**Major Code:** 81

**Educational Background:** Baccalaureate degree and 24 business credits, subject to approved school admission requirements.

**Degree Length:** 9 - 12 months.

**Educational Skill Requirements:**

1. Working knowledge of engineering terms common to construction operations, equipment and material procurement, maintenance, estimating and bidding techniques, work scheduling, quality control techniques, resource allocation, common construction practices, construction organizations, and financing. (General Engineering)
2. Understand the operating processes and concepts of the private sector and apply these processes and concepts to acquisition of facilities and services through joint ventures and other innovative business practices. (Facility Finance)
3. Understand private and public organizational financing, including corporate financial structures; cost and financial accounting; capital budgeting techniques; financial engineering, and financial analysis. Knowledge of the principles of economics, including monetary and fiscal theories. (Accounting)
4. Understand methods to develop and implement a financial planning structure in conformity with fiscal restraints and government policy. Implicit is an ability to employ various techniques for financial analysis, allocation of funds, and developing alternate sources and forms of financing for capital projects. (Economics)
5. Understand methods to collect, process, analyze, and report information generated by organizations, based on approved financial and management accounting concepts. (Accounting – Financial and Management Concepts)
6. Knowledge of the theories, principles, and techniques of interdisciplinary management of a complex business venture, including the disciplines of systems design, resource allocation, managerial theory, optimization techniques, and cost-benefit analysis. Interdisciplinary Management of Complex Business – Systems, Optimization, Cost-benefit)
7. Knowledge of statistics relative to decision-making, probability theory, sampling techniques, contingency table analysis, hypothesis testing, simple and multiple regression analysis, and analysis of variance. (Probability and Statistics)
8. Knowledge of problems meeting the growing energy demand. Selection of energy sources and their corresponding advantages and disadvantages. (Energy Demand and Sources)
9. Basic understanding of information systems, data processing and computer techniques for application to financial problems. (Data Processing)
10. Proficiency in oral and written communications and ability to identify, research, and recommend alternatives to various financial and engineering problems for presentation to both technical and non-technical managers. (Communication)
12. If a thesis or major report is required for the degree, the topic selected must be applicable to facilities acquisition or business practices relative to the Navy facilities business or extends knowledge in a particular technical engineering area. (Thesis/Report)

Note: The requirements for the facilities acquisition option should be satisfied by courses which emphasize the business practices and innovative acquisition strategies to improve capitalization and re-capitalization of Navy shore facilities. Courses in the school of business should generally be taken in lieu of the more specialized technical courses typically found in an engineering curricula.

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**Engineering Management (470H)**

**Subspecialty Obtainable:** 1101P - Facilities Engineering

**Applicable Designator:** 5100

**Major Code:** 54

**Educational Background:** ABET accredited baccalaureate degree in engineering. Officers with a first professional degree in architecture are considered on a case-by-case basis only if they have a strong undergraduate background in technical subjects.

**Degree Length:** 9 - 12 months.

**Educational Skill Requirements:**

1. Working knowledge of engineering terms common to equipment and material procurement, maintenance, estimating and bidding techniques, work scheduling, quality control techniques, resource allocation, common construction practices, construction organizations, and financing. (General Engineering)
2. Familiarity with basic elements of a contract, types of specifications, general provisions, resolution of legal disputes, and negotiating strategies. (Construction Contracts)
3. At least one course which extends knowledge in any of the classical engineering disciplines. Can be in any technical area, such as structural engineering, pavement design, environmental engineering, soils analysis or design, hydraulics, hydrology, mechanical or electrical engineering. (Technical Engineering)
4. Knowledge of problems meeting the growing energy demand. Selection of energy sources and their corresponding advantages and disadvantages. (Energy Demand and Sources)
5. Basic understanding of data processing and computer techniques for application to engineering problems. (Data Processing)
6. Working knowledge of and ability to apply business and financial accounting principles. (Accounting)
7. Technical analysis of process, organizational, and production issues encountered in the industry. (Production Analysis)
8. Organizational analysis of language, concepts and principles related to integrating technical, structural, and human aspects of organizations. Identifying and resolving organizational issues within technical enterprises. (Organizational Management)
9. Proficiency in oral and written communications and ability to identify, research, and recommend alternatives to various engineering problems for presentation to both technical and non-technical managers. (Communications)
10. If a thesis or major report is required for the degree, the topic selected must be applicable to engineering and management problems found in the Navy facilities business or extends knowledge in a particular technical engineering area. (Thesis/Report)

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**Architecture and Urban Design (470I)**

**Subspecialty Obtainable:** 1101P - Facilities Engineering

**Applicable Designator:** 5100

**Major Code:** 65

**Educational Background:** First professional NAAB accredited degree in architecture.

**Degree length:** 12 months.

**Educational Skill Requirements:**

1. Understanding of the demographic and socio-economic systems which make up a location, including population characteristics and monitoring techniques, employment characteristics, revenue resources, and cultural factors. (Urban Demographics)
2. Basic understanding of political systems, including municipal organizations and services; multi-jurisdictional coordination; federal, state and regional policy, programs and support; and capital improvement programs. (Urban Policy and Programs)
3. Working knowledge of land use planning including considerations of zoning regulations and laws; environmental concerns such as aesthetics, development density, open space, protection and preservation of scarce resources and cultural artifacts; and factors impacting housing, transportation, utilities, and waste treatment/disposal systems. (Urban Planning)
4. Understanding and ability to incorporate economic dynamics in planning and design. (Economic Planning and design)
5. Working and practical knowledge of the development, financing, and execution of capital improvement programs. ((Capital Finance)
6. Basic knowledge of architectural, landscape and urban design. (General Urban Design)
7. Introductory knowledge of physical science including geology, topology, meteorology, climatology, and hydrology. Understanding of bio-systems, including terrestrial and marine ecosystems and habitat associations. (Terrestrial Systems)
8. Knowledge of problems meeting the growing energy demand. Selection of energy sources and their corresponding advantages and disadvantages. (Energy Demand and Sources)
9. Basic understanding of data processing and computer techniques for application to architecture/engineering problems. (Data Processing)
10. Working knowledge of and ability to apply business and financial accounting principles. (Accounting)
11. Proficiency in oral and written communications and ability to identify, research, and recommend alternatives to various architecture/engineering problems for presentation to both technical and non-technical managers. (Communications)
12. If a thesis or major report is required for the degree, the topic selected must be applicable to facilities planning issues found in the Navy. (Thesis/Report)

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**Electrical Engineering, Shore Facilities (471)**

**Subspecialty Obtainable:** 1101P - Facilities Engineering

**Applicable designator:** 5100

**Major Code:** 5650

**Educational Background:** ABET accredited baccalaureate degree in electrical engineering.

**Degree Length:** 9 - 12 months.

**Educational Skill Requirements:**

1. Theoretical and working knowledge of power systems engineering, including various power sources power supply protection, reliability and fault analysis, and systems grounding. (Power Systems)
2. Ability to plan and design electrical systems to include a working knowledge of load characteristics, voltage considerations, circuit arrangements and overhead and underground systems. (Electrical System Design)
3. Working knowledge of protective devices and relays. (Electrical Systems – Circuits)
4. Basic understanding of the functions of transformers, regulators, rectifiers, converters and inverters. (Electrical Systems – Transformers)
5. Basic understanding of and ability to apply principles of control systems. (Electrical Systems – Control Systems)
6. Basic understanding of electromagnetic communications systems. (Electrical Systems - Communications)
7. Knowledge of problems meeting the growing energy demand. Selection of energy sources and their corresponding advantages and disadvantages. (Energy Demand and Sources)
8. Basic understanding of data processing and computer techniques for application to engineering problems. (Data Processing)
9. Working knowledge of and ability to apply business and financial accounting principles. (Accounting)
10. Proficiency in oral and written communications and ability to identify, research, and recommend alternatives to various engineering problems for presentation to both technical and non-technical managers. (Communications)
11. If a thesis or major report is required for the degree, the topic selected must be applicable to electrical engineering problems found in the Navy facilities business or extends knowledge in a particular technical engineering area. (Thesis/Report)

Environmental Modeling Sustainable Energy & Building Design Climate Change Solutions Energy Conversion & Storage Environmental Law Building Energy Audits Advanced Solar Design  Computer Simulation of HVAC Systems HVAC System Design Sustainability of the Built Environment	Building Energy Systems Advanced Data Analysis Renewable Energy and Power Solar Thermal Power & Wind Energy Climate Solutions Energy Technology and Policy Conventional and Renewable Energy Issues Renewable Energy Policy
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**Ocean Engineering (472)**

**Subspecialty Obtainable:** 1103P – Ocean Engineering

**Applicable Designator:** 5100

**Major Code:** 4760

**Educational Background:** ABET accredited baccalaureate degree in engineering, with preference toward ocean, civil and mechanical engineering. Other degrees will be considered by the Ocean Facilities program office on a case-by-case basis.

**Degree length:** 15 – 18 months.

**CORE Educational Skills Requirements:**

1. Ability to measure and apply the environmental loading effects of wind, currents, waves, and, if available, seismic activity to the design of flexible and rigid structures. (Environmental Loading)
2. Working knowledge of seafloor sediment and rock, including types and properties, sampling and testing, and ability to use this knowledge to determine facility foundation and anchoring requirements. (Geotechnical course preferably including marine applications)
3. Understanding of the types of marine materials, their engineering properties, principles of corrosion, and the techniques of cathodic protection for ocean facilities. (Materials course w/corrosion)
4. Working knowledge of physical oceanography, including a thorough understanding of seawater properties, currents, tides, and meteorological conditions, and ability to predict operational and extreme environmental conditions through the application of advanced probability analysis of wave spectra and classical wave theories. (Physical Oceanography Course)
5. Basic knowledge of water wave theory, the properties of ocean surface waves and the effects of ocean waves on fixed and floating ocean structures. (Ocean Wave Mechanics Course)
6. Understanding of coastal processes, storm surge, tides, and other physical factors that affect the static and dynamic coastal geomorphology and sediment transport. Ability to determine the effects on structures, shorelines, and harbors. (Coastal Processes and/or Coastal Engineering Course)
7. Understanding of hydrodynamics including fluid flow behavior, resistance determination, and modeling of facility behavior under scaled conditions. (Hydrodynamics or Advanced Fluid Mechanics Course)
8. Basic knowledge of ocean construction practices including methods and limitations of working in the offshore environment on fixed and floating facilities, pipelines, cables, and mooring systems. (Design Course - with ocean project as chosen design)
9. Basic knowledge of the principles of naval architecture including but not limited to hydrostatics, ship stability and operability, materials, fluid dynamics and propulsion. (Naval Architecture)
10. Basic knowledge of project and program management, and systems engineering. (Program Management)
11. A thesis or major report **is** required for the degree. The topic selected must be applicable to the type of ocean engineering problems typically found in the Navy, or extends knowledge in a particular technical engineering area. POC for coordination of thesis topic is Deputy OFP Director, (202) 433-5596.
12. Basic understanding of data processing and computer techniques for application to engineering problems. (Data Processing)
13. Working knowledge of, and ability to apply, business and financial accounting principles. (Accounting)

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14. Proficiency in oral and written communications and ability to identify, research, and recommend alternatives to various engineering problems for presentation to both technical and non-technical managers. (Communications)

15. Knowledge of problems meeting the growing energy demand. Selection of energy sources and their corresponding advantages and disadvantages. (Energy Demand and Sources)

\*\*\*Candidates are required to complete all CORE ESRs over the course of the graduate degree and must also complete a minimum of one ELECTIVE ESR. \*\*\*

**Elective Educational Skills Requirements:**

1. Working knowledge of design methodologies for ocean structures, including finite element and difference models, modal analysis, and general quasi-static analysis. Application of the principles of fatigue and fracture mechanics to the design of ocean facilities. (Numerical Modeling Course)

2. Basic knowledge of the classical branches of geological, biological, or chemical oceanography. (Geology)

3. Working knowledge of advanced ocean construction practices including methods and limitations of working in the offshore environment on fixed and floating facilities, pipelines, cables, and mooring systems. (Ocean Construction)

4. Basic knowledge of the principles of at least one of the following topics: (1) underwater acoustics, (2) hyperbaric design, (3) data instrumentation engineering.

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**Mechanical Engineering, Shore Facilities (473A)**

**Subspecialty Obtainable:** 1101P - Facilities Engineering

**Applicable designator:** 5100

**Major Code:** 5750

**Educational Background:** ABET accredited baccalaureate degree in mechanical engineering.

**Degree Length:** 9 - 12 months.

**Educational Skill Requirements:**

1. Application of basic principles of thermodynamics, heat transfer, and fluid mechanics to the analysis and design of industrial system components and equipment. (Thermodynamics)
2. Working knowledge of mechanical engineering problems associated with electrical power production in steam power plants, gas turbine engines, fossil fuel power plants and nuclear power plants. (Electrical Power Production)
3. Understanding of basic heating, ventilating and air-conditioning system design, including central plant components and equipment; understanding designs to control air pollutants; absorption and adsorption of gaseous pollutants; and air quality modeling/monitoring. (Heating and Ventilation)
4. Understanding of simulation methods of modeling techniques as methods of solving problems associated with mechanical design; including a basic understanding of data processing and computer techniques for application to engineering problems. (Mathematical Modeling)
5. Knowledge of problems meeting the growing energy demand. Selection of energy sources and their corresponding advantages and disadvantages. (Energy Demand and Sources)
6. Working knowledge of and ability to apply business and financial accounting principles. (Accounting)
7. Proficiency in oral and written communications and ability to identify research and recommend alternatives to various engineering problems for presentation to both technical and non-technical managers. (Communications)
8. If a thesis or major report is required for the degree, the topic selected must be applicable to mechanical engineering problems found in the Navy facilities business or extends knowledge in a particular technical engineering area. (Thesis/Report)
9. Specialize in one of the three mechanical engineering subspecialty areas as detailed below. Curriculum course content shall provide coverage of the majority of subtopics shown under either "Thermal", "Fluids" or "Materials/Machine Design" as indicated:

**Fluids**

Navier-Stokes equations  
Boundary layer theory  
Two-dimensional incompressible and compressible fluids  
Viscous flow in laminar and turbulent layers  
Applications to turbomachinery  
Flow measurement techniques  
Control methods for unsteady flow  
Analysis of fluid networks / devices

**Thermal**

Mass transfer and transport properties  
Droplet, particle and slurry combustion  
Flammability, ignition, extinction & flame stability  
Combustion in flow systems  
Sprays  
Laminar and detonation waves  
Vapor/combustion/refrigeration/compression

**Materials/Machine Design**

Machine design - turbomachinery  
Pumps  
Compressors  
Fans  
Gears  
Robotics  
Control systems  
Hydraulics & Pneumatics

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**Mechanical Engineering, Energy Management (473B)**

**Subspecialty Obtainable:** 1101P - Facilities Engineering

**Applicable designator:** 5100

**Major Code:** 5750

**Educational Background:** ABET accredited baccalaureate degree in mechanical engineering or other ABET accredited engineering degree if acceptable to the civilian institution.

**Degree Length:** 9 - 12 months.

**Educational Skill Requirements:**

1. Understanding of the basic workings of the systems that supply, distribute, and utilize energy. This can include fossil fuels, nuclear energy, and renewable sources. (Energy Conversion and Supply)
2. Knowledge of current energy demands across various sectors and understanding of tools and technologies used to measure efficiencies and energy demand response. (Energy Demand and Utilization)
3. Understanding energy and environmental policy and the economic impacts of public policy related to the energy and environment. (Energy Policy and Economics)
4. Knowledge of renewable energy sources, availability, implementation and management of renewable resources. (Renewable Energy)
5. Understanding of simulation methods of modeling techniques as methods of solving problems associated with energy system; including a basic understanding of data processing and computer techniques for application to engineering problems. (Mathematical Modeling)
6. Working knowledge of and ability to apply business and financial accounting principles. (Accounting)
7. Proficiency in oral and written communications and ability to identify research and recommend alternatives to various engineering problems for presentation to both technical and non-technical managers. (Communications)
8. If a thesis or major report is required for the degree, the topic selected must be applicable to energy problems found in the Navy facilities business or extends knowledge in a particular technical energy area. (Thesis/Report)

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**Naval Postgraduate School Financial Management (837)**

**Subspecialty Obtainable:** 3110P – Financial Management – Defense Focus

**Applicable designator:** various

**Degree Length:** 18 months.     **Entry Dates:** January and/or July, depending on PRD

**Educational Background:** A baccalaureate degree with above-average grades is required. Completion of at least two semesters of college algebra or trigonometry is considered to be the minimum mathematical preparation. An APC of 345 is required for entry.

**Overview:** The Master of Business Administration (MBA) is a defense-focused MBA program designed to provide officers and DoD civilians an advanced education in interdisciplinary approaches to problem solving and policy analysis by applying quantitative, financial, economic, information technology, and other state-of-the-art management techniques and concepts to military management and policy issues. Graduates of the MBA program will know the latest management theories and practices, including leadership, communication, organization design, and planning, and how to apply them within large public and private sector organizations, as well as military sub-units and activities.

The MBA degree program has been designed to meet four objectives:

- To provide a defense-focused graduate management education program of specific relevance to U.S. military officers and DoD civilians.
- To satisfy educational requirements for military subspecialties.
- To meet the Association to Advance Collegiate Schools of Business International (AACSB) and the National Association of Schools of Public Affairs and Administration (NASPAA) accreditation requirements.
- To allow officers to complete JPME requirements, if desired.

To satisfy these objectives, the MBA program consists of four parts:

- Business Core (37 credit hours)
- Mission-Related Core (16 credit hours)
- Curricular Concentration (24+ credit hours)
- Master's Application Project or Thesis

One of several possible curricula can be chosen:

- Acquisition and Contract Management [More>>](#)
- Financial Management [More>>](#)
- Logistics, Transportation, and Supply Chain Management [More>>](#)
- Information Management [More>>](#)
- Defense Business Management [More>>](#)
- Systems Acquisition Management [More>>](#)

**Additional Info on NPS website:** <http://www.nps.edu/Academics/Schools/GSBPP/Academics/mba.html>

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**Naval Postgraduate School Financial Management (838)**

**Subspecialty Obtainable:** 3110P – Financial Management – Energy Focus

**Applicable designator:** various

**Degree Length:** 18 months.     **Entry Dates:** January and/or July, depending on PRD

**Educational Background:** A baccalaureate degree with above-average grades is required. Completion of at least two semesters of college algebra or trigonometry is considered to be the minimum mathematical preparation. An APC of 345 is required for entry. International students should refer to the Admissions section for current TOEFL and entrance requirements.

**Overview:** The Graduate School of Business & Public Policy offers an eighteen-month MBA in Financial Management with an energy focus. The Financial Management — Energy curriculum prepares officers for business, financial management, and analysis positions within the DoN and DoD, and provides an advanced education in energy-related problem solving.

Graduate courses cover topics such as energy economics, energy strategy and policy, financial reporting standards, cost standards, cost analysis, budgeting and financial management, internal control, auditing, management planning and control systems, strategic resource management, quantitative techniques used in planning and control, system acquisition and program management, and the Planning Programming, Budgeting Execution System (PPBES) used within the Department of Defense.

Graduates of the Financial Management — Energy curriculum will be prepared for assignment to positions in strategic planning, business analysis, financial analysis, budgeting, accounting, business and financial management, and internal control systems and auditing.

The MBA degree program has been designed to meet four objectives:

- To provide a defense-focused graduate management education program of specific relevance to U.S. military officers and DoD civilians.
- To satisfy educational requirements for military subspecialties.
- To meet the Association to Advance Collegiate Schools of Business International (AACSB) and the National Association of Schools of Public Affairs and Administration (NASPAA) accreditation requirements.
- To allow officers to complete JPME requirements, if desired.

**Additional Info on NPS website:**

<http://www.nps.edu/Academics/Schools/GSBPP/Academics/MBA.html#financial>

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**Naval Postgraduate School Mechanical Engineering (536)**

**Subspecialty Obtainable:** 1101P - Facilities Engineering

**Applicable designator:** various

**Degree Length:** 18 months.     **Entry Dates:** January and/or July, depending on PRD

**Educational Background:** A baccalaureate degree with above-average grades is required. Completion of at least two semesters of college algebra or trigonometry is considered to be the minimum mathematical preparation. An APC of 345 is required for entry.

**MSME Program Educational Objectives**

The overall Program Educational Objective of the Mechanical Engineering Program is to support the NPS Mission by producing graduates who have knowledge and technical competence at the advanced level in Mechanical Engineering in support of national security. In order to achieve this goal, the specific objectives are to produce graduates who are expected to achieve the following within a few years of graduation:

1. Have become technical experts who are able to formulate and solve important engineering problems associated with national security in Mechanical Engineering and related disciplines using the techniques, skills and tools of modern practice, including experiments, and modeling and simulation. These problems may include issues of research, design, development, procurement, operation, maintenance or disposal of engineering components and systems for military applications.
2. Have assumed positions of leadership in the specification of military requirements in the organization and performance of research, design, testing, procurement and operation of technically advanced, militarily effective systems. The graduate must be able to interact with personnel from other services, industry, laboratories and academic institutions, and be able to understand the role that engineering and technology have in military operations, and in the broader national and global environment.
3. Can communicate advanced technical information effectively in both oral and written form.

**Student Outcomes**

1. Graduating students will meet the ABET a through k outcomes either by previous attainment of an ABET BSME Degree, or by having the knowledge and skills equivalent to an ABET-accredited BSME.
2. Graduating students will have a minimum of one (1) year of advanced study beyond the bachelor's level and have advanced level knowledge in Mechanical Engineering as demonstrated by the ability to apply master's level knowledge in one of the available specialized disciplines of Mechanical Engineering.
3. Graduating students will have the ability to apply technical knowledge in a leadership role related to national security.

The ABET (a) through (k) outcomes are:

- (a) an ability to apply knowledge of mathematics, science, and engineering
- (b) an ability to design and conduct experiments, as well as to analyze and interpret data
- (c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and

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sustainability

- (d) an ability to function on multidisciplinary teams
- (e) an ability to identify, formulate, and solve engineering problems
- (f) an understanding of professional and ethical responsibility
- (g) an ability to communicate effectively
- (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- (i) a recognition of the need for, and an ability to engage in life-long learning
- (j) a knowledge of contemporary issues
- (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

### Overview

A candidate shall have completed work equivalent to the requirements of this department for the Bachelor of Science degree in Mechanical Engineering. Candidates who have not majored in mechanical engineering, or who have experienced significant lapses in continuity with previous academic work, will initially take undergraduate courses in mechanical engineering and mathematics to fulfill these requirements in preparation for their graduate program.

### Degree Requirements

The Master of Science degree in Mechanical Engineering requires a minimum of 48 quarter-hours of graduate level work. The candidate must take all courses in an approved study program, which must satisfy the following requirements: There must be a minimum of 32 quarter hours of credits in 3000 and 4000 level courses, including a minimum of 12 quarter hours at the 4000 level. Of the 32 quarter hours at least 24 quarter-hours must be in courses offered by the MAE Department.

A student seeking the Master of Science degree in Mechanical Engineering must also demonstrate competence at the advanced level in at least one of the available disciplines of Mechanical Engineering. These disciplines are the thermal-fluid sciences; solid mechanics, shock and vibration; dynamic systems and control; system design; and materials science. This may be accomplished by completing at least eight quarter-hours of the 4000 level credits by courses in this department and a thesis in one of these discipline areas.

### Thesis Requirements

An acceptable thesis for a minimum of 16 credits is also required for the Master of Science degree in Mechanical Engineering. An acceptable thesis for the degree of Mechanical Engineer may also meet the thesis requirement of the Master of Science in Mechanical Engineering degree. The student's thesis advisor, the Academic Associate, the Program Officer and the Department Chairman must approve the study program and the thesis topic.

**Additional Info on NPS website:** <http://www.nps.edu/Academics/GSEAS/MAE/Academics/msme.asp>

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Appendix D –Approved Graduate Schools & Curricula**

**Appendix D**

**Civil Engineer Corps Approved Curricula**

**CURRICULUM LEGEND**

Civil Engineering, Construction Option	470A
Civil Engineering, Environmental Option	470B
Civil Engineering, Geotechnical/Soils Option	470C
Civil Engineering, Public Works Option	470D
Civil Engineering, Structural Option	470E
Civil Engr., Urban, Regional or City Planning Option	470F
Facilities Financial Program Management	470G
Engineering Management	470H
Architecture and Urban Design	470I
Electrical Engineering, Shore Facilities	471
Ocean Engineering	472
Mechanical Engineering, Shore Facilities	473A
Mechanical Engineering, Energy Management	473B
NPS Financial Management – Defense Focus	837
NPS Financial management – Energy Focus	838
NPS Mechanical Engineering – Shore Facilities	563

NOTE: The lack of an X in the box for a particular curriculum at a particular university does not necessarily mean the degree is not offered there. An X indicates that an academic review or actual student verified that that degree is offered and has met the Navy's requirements in the past. Please refer to the University's current website and/or catalog to confirm degree programs and course offerings.

**Every student is required to create and submit a personal Education Plan that demonstrates fulfillment of the Navy's ESRs for the chosen curriculum.**

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**Civil Engineer Corps Approved Graduate Schools and Curriculum**

School	470A	470B	470C	470D	470E	470F	470G	470H	470I	471	472	473A	473B
University of Alabama	X	X			X			X					
University of Arkansas		X	X		X					X		X	
Arizona State University	X	X	X		X								
University of California at Berkeley	X	X	X		X	X				X		X	X
University of California at Los Angeles	X	X			X				X				
University of California at San Diego											X		
California State Univ Northridge								X					
Carnegie Mellon University	X	X											X
University of Cincinnati	X	X	X		X								
Clemson University	X		X		X	X							
University of Colorado	X	X	X		X			X		X		X	X
Colorado State University	X	X	X		X					X		X	X
University of Connecticut		X	X		X	X						X	
University of Florida	X	X	X	X	X	X	X			X		X	X
Florida Atlantic University											X		
Georgia Institute of Technology	X	X	X		X	X			X	X		X	
University of Hawaii ****	X	X	X		X	X	X				X	X	
University of Illinois at Urbana-Champaign	X	X			X	X				X		X	
University of Kentucky	X	X	X		X								
Louisiana State University	X				X			X					
University of Maryland	X	X	X		X			X		X		X	X
Massachusetts Institute of Technology		X		X	X								
Naval Post Graduate School							837						838/563
University of Nevada, Las Vegas	X	X	X		X								
University of New Hampshire											X		
North Carolina State University	X	X	X		X					X		X	X
Old Dominion University		X						X					
Oregon State University	X	X	X		X						X	X	
Pennsylvania State University		X	X		X					X		X	
Purdue University	X	X	X	X	X	X				X		X	
University of Rhode Island							X				X		
Rutgers University	X	X	X		X							X	
San Diego State University	X	X	X		X								
University of South Carolina		X	X		X					X		X	
Stanford University	X	X	X		X								
University of Texas at Austin	X	X	X		X					X		X	
Texas A & M University	X	X	X	X	X	X				X	X	X	
Virginia Polytechnic Institute	X	X	X		X								
University of Washington	X	X	X		X	X				X		X	
University of Wisconsin, Madison	X	X	X		X								