

Aerospace and Ocean Engineering Class of 2017 Information Session

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We are here to help you in every way possible to achieve your goal of earning a Bachelor of Science degree in Aerospace and/or Ocean Engineering

AOE Dept Head, Dr. Eric Paterson

A Message From the Department Head



Dr. Eric Paterson, Department Head, Aerospace and Ocean Engineering

I am pleased to introduce to you my distinguished colleagues, the faculty and staff of Aerospace and Ocean Engineering. There are currently 19 fulltime faculty members, with graduate and undergraduate engineering degrees from 28 different universities in 7 different countries. Many work in both aerospace and ocean fields, but some specialize in one or the other. There are more than a dozen administrative and technical staff who support the research and education mission of the department, and more than a dozen research faculty who conduct research and in some cases participate in the department's teaching mission.

Our faculty numbers include four Professors who have been elected as Fellows of their professional engineering societies, four who have been honored by Virginia Tech with prestigious named

professorships, and four junior faculty who have been honored by national agencies with highly competitive young investigator awards. These faculty members are responsible for educating one of the larger classes of Aerospace Engineering B.S. graduates in the nation, as well as a significant number of Ocean Engineering B.S. graduates. The department has awarded 100 or more B.S. degrees per year during the past several years, with graduates going to industry, government, graduate school, and professional school. The department's faculty are active in externally funded research, with more than \$6.5 million in annual research expenditures. Research projects play a significant role in the education of graduate students, and we award some 30 M.S. degrees and 10 Ph.D. degrees annually.

Administration

- » Dr. Eric Paterson
- » Dr. Bob Canfield
- » Dr. William Devenport
- » Dr. Craig Woolsey

Faculty

- » Dr. Alan Brown
- » Dr. Bob Canfield
- » Dr. William Devenport
- » Dr. Mazen Farhood
- » Dr. Troy Henderson
- » Dr. Owen Hughes
- » Dr. Rakesh K. Kapania
- » Dr. Todd Lowe
- » Dr. Lin Ma
- » Dr. William Mason
- » Dr. Leigh McCue
- » Dr. Wayne Neu
- » Dr. Eric Paterson

AOE Faculty

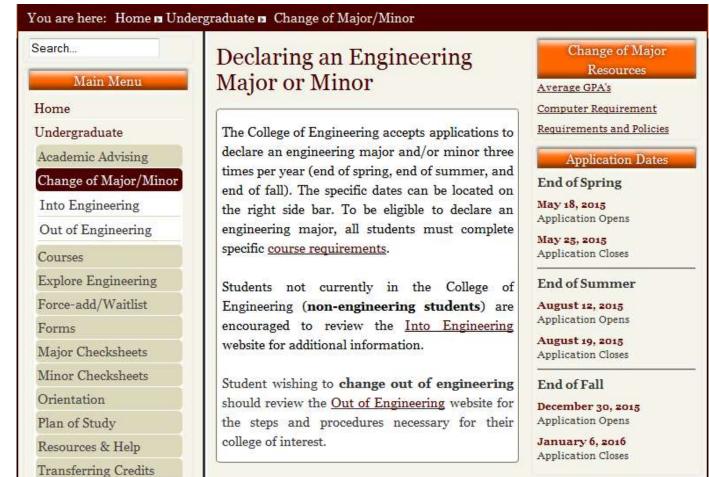


Agenda

- Welcome
- Information Packets
- AOE Policies
- Academic Plan of Study
 - AE or OE Degree
 - Double Majors & Minors
- Co-Ops & Internships
 - Claire Childress (Career Services)
- Final Advice



Change of Major Application





Major Checksheets

- Checksheets:
 - http://www.registrar.vt.edu/undergraduate/checksheets/college/index.html
 - Select the year closest to your projected graduation date.
- Checksheets show:
 - Courses required for graduation
 - Required courses that fulfill the CLE areas
 - When certain courses will likely be taken
 - Some checksheets show prerequisites & corequisites but all are laid out differently!

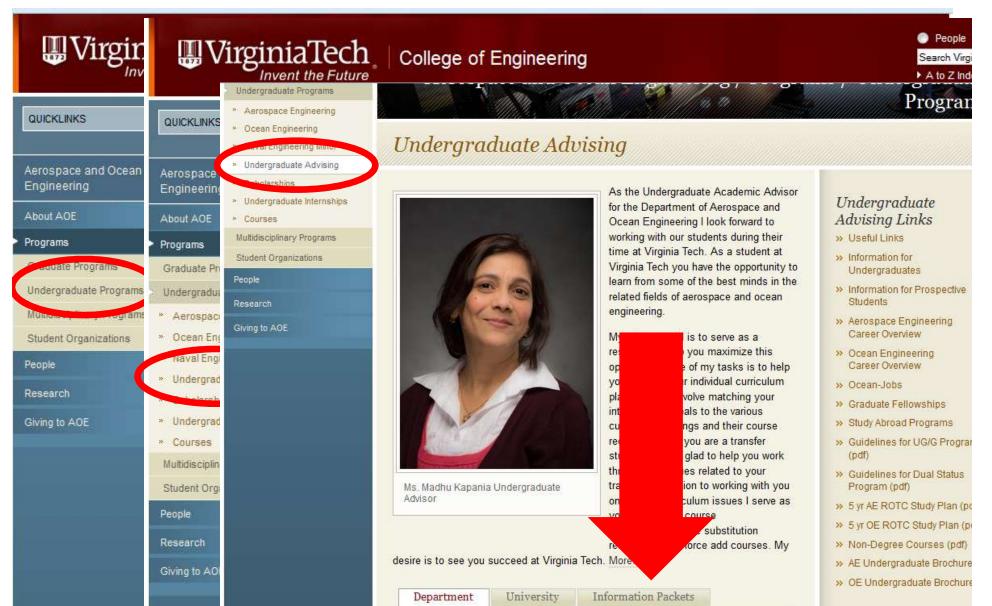


Information Packets

- You now have a copy of the <u>Class of</u>
 2018 Information Packet
 - Read it, Save it, Use it!
 - Bring it with you when you visit your advisor
- If you become a member of a later Class, you will need to get a copy of the Class of 20xx Information Packet
- These information packets are all on the AOE website at
 - http://www.aoe.vt.edu/saffairs/advising

AOE Online

www.aoe.vt.edu



Some AOE Policies

- E-Mail Listservs: We maintain listservs for sophomores, juniors, and seniors
 - Pay attention to the emails
 - Going to your PID!
- In-Major GPA Rule: You must maintain a 2.0 or better GPA in your AOE courses

Advisors

- You will be assigned a faculty advisor from among the AOE faculty
- Please make an appointment to meet your faculty advisor as soon as possible
- If you want to change advisors for any reason, contact Dr. Canfield.
- AOE also has a dedicated Career and Curriculum Advisor, Ms. Kapania (<u>mkapania@vt.edu</u>)
 - Her office is in Randolph 224-A
 - Her office hours are Monday-Friday 8:30AM to 3:30PM
 - Drop in during office hours, or make an appointment to discuss concerns about your academic progress

AOE Advising

Madhu Kapania

Office: Rand 224-A

Phone: 231-6699

E-mail: mkapania@vt.edu

Website: http://www.aoe.vt.edu/saffairs/advising

Office Hours 8:30 to 3:30

Advising on Academic Issue

General Schedule Issues:

- Schedule Courses; to stay on Track
- ROTC; Five year plan
- Co-ops
- Internships
- Study abroad

Course Transfer Issues:

- If take course elsewhere; Check the equivalency database at VT's site
- Fill in the TR form and give it to Dean's office
- Send the transcripts to Registrar's office once course is complete
- Minimum tr grade is C and only the hours will count, not the GPA
- If you have send in the hours but don't see in your transcripts, see me as the course might require the substitution.
- http://www.tranguide.registrar.vt.edu/

Force-adds:

• If the class is full or the system is not seeing the prerequisites

Course Withdrawal:

- Up to 3 courses;
- Does not count towards GPA
- Download the form from the Dean's site and get my signatures on it.

Undergraduate Research Form:

- AOE 2994, 4994, 4974 are the undergraduate courses for the research.
- Need to fill in the form so it shows in your transcripts

Plan for Improvement (For GPA below 2.0)

- Need to have the GPA of 2.0 and above (even for In-major)
- Plan of courses to improve the GPA

Email Lists (Listservs)

- Listservs for Sophomores, Juniors, Seniors and Undergraduates
- For departmental notifications
- Co-ops, internships, scholarship opportunities
- Read the emails



Tools For Course Scheduling

Plan of Study

- Pathways Planner (HokieSpa)
- Web Resources: http://www.enge.vt.edu/Undergraduate/plansofstudy.html

Degree Audit Reporting System (DARS)

- On HokieSpa, it is highly recommended that you RUN A "what if" DARS for the major you desire to enter http://www.registrar.vt.edu/academic_records/dars/index.html to MAKE SURE you understand what requirements you have yet to fulfill to earn your degree.
- Unofficial Transcripts: HokieSpa

For internships or co-ops





Class Registration Dates

Office of the University Registrar

Virginia Tech Home

Classroom Audio/Visual

Academic Records

Accreditation

Campus Locations

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Dates & Deadlines

Academic Calendar

Course Request Dates

Timetable Calendar

Drop/Add & Registration Dates

Timetable Actions & Dates

Class Meeting Times

Grade Deadlines

Grade Dates & Accessibility

Undergraduate Course Catalog Updates

Census Dates



Course Request Dates

Course Request

- » Spring 2015: October 21-28, 2014
- » Summer 2015: December 5, 2014 February 6, 2015
- » Fall 2015: March 24-31, 2015

Web Drop/Add

- » Spring 2015 opens November 29, 2014
- » Summer 2015 opens March 14, 2015
- » Fall 2015 opens April 18, 2015 and closes May 15, 2015. Drop/Add for Fall 2015 will re-open on August 8, 2015.

Contact Information

Our office is located in Student Services Building, Suite 250. Our business hours are 8 a.m. to 5 p.m., Monday through Friday with the exception of holidays.

Office of the University Registrar (MC 0134) Student Services Building, Suite 250, Virginia Tech

800 Washington St., SW

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https://www.registrar.vt.edu/dates_deadlines/course_request_dates/index.html





Things to keep in mind...

- Full time status during fall & spring semesters is 12 hours, maximum credit hours is 19.
- Full time status during summer sessions (I & II) is 5 hours per session, maximum credit hours is 9.
- Be sure to check for any required co-requisites, pre-requisites, and/or major restrictions. Click on CRN# for comments and restrictions on the timetable of classes.
- Some classes are only offered the semester listed on the checksheet.
- There can be multiple sections of a class; some sections might be restricted while
 others are not. If a class you want is restricted please check other CRN numbers to
 see if any sections are not restricted.





Transfer Course Equivalents

- Students interested in taking classes at another college or university should carefully read the transfer credit request form and additional information at: http://www.enge.vt.edu/Undergraduate/transferringcourses.html
- The <u>Transfer Credit Request Form</u> contains the policies and procedures for seeking pre-approval, instructions for finding equivalent courses, the submission process, time frame for approval, directions for getting the official transcript sent back to VT for credit, and etc.



Sophomore Year (AE)

FALL			SPRING				
AOE	2074	COMP METHODS	2*	AOE	3094	AOE MATERIALS	3
AOE	2104	INTRO AERO ENGR	2	AOE	3104	AIRCRAFT PERFORMANCE	3*
ESM	2104	STATICS	3	ESM	2204	MECH DEFORM BODIES	3
MATH	2224	MULTI VAR CALC	3	ESM	2304	DYNAMICS	3
PHYS	2306	PHYSICS II	4	MATH	2214	DIFFERENTIAL EQUATIONS	3
MATH	2114	LINEAR ALGEBRA	3	ELECTIVE**			3
	•		17				18

^{* [}SATISFACTORY PROGRESS] Students must have passed AOE 3104 after attempting 68 credit hours.

Sophomore Year (OE)

		FALL				SPRING	
AOE	2074	COMP METHODS	2*	AOE	3094	AOE MATERIALS	3
AOE	2204	INTRO OCEAN ENGR	3	AOE	3204	NAVAL ARCITECTURE	3*
ESM	2104	STATICS	3	ESM	2204	MECH DEFORM BODIES	3
MATH	2224	MULTI VAR CALC	3	ESM	2304	DYNAMICS	3
PHYS	2306	PHYSICS II	4	MATH	2214	DIFFERENTIAL EQUATIONS	3
MATH	2114	LEANIER ALGEBRA	3	ELECTIVE**			3
			18	 			18

^{* [}SATISFACTORY PROGRESS] Students must have passed AOE 3204 after attempting 68 credit hours.

Sophomore Year (AE/OE and OE/AE Double Majors)

		FALL				SPRING	
AOE	2074	COMP METHODS	2*	AOE	3094	AOE MATERIALS	3
AOE	2104/ 2204	INTRO AERO/ OCEAN ENGR	2/3	AOE	3104	AIRCRAFT PERFORMANCE	3*
ESM	2104	STATICS	3	AOE	3204	NAVAL ARCITECTURE	3*
MATH	2224	MULTI VAR CALC	3	ESM	2204	MECH DEFORM BODIES	3
PHYS	2306	PHYSICS II	4	ESM	2304	DYNAMICS	3
MATH	2114	LINEAR ALEGBRA	3	MATH	2214	DIFFERENTIAL EQUATIONS	3
			17/ 18				18

^{* [}SATISFACTORY PROGRESS] Students must have passed AOE 3104 / 3204 after attempting 68 credit hours.

Junior/Senior (AE)

JUNIOR FALL SEMESTER 2015		JUNIOR SPRING SEMESTER 2016		
MATH 4564 Operational Methods (C-) Pre: MATH 2214		MATH Elective Choice of: MATH 4574, MATH 4404, or STAT 4705	3	
ME 3134 Fund of Thermodynamics (C–) Pre: MATH 2214		AOE 3054 AOE Experimental Methods (C-) Pre: 3014, 3024, and 3034	3	
AOE 3014 Aero/Hydrodynamics (C–) Pre: 3104 or 3204, ESM 2304	3	AOE 3114 Compressible Aerodynamics (C-) Pre: 3014, ME 3134	3	
AOE 3024 Thin-Walled Structures (C–) Pre: ESM 2104, ESM 2204		AOE 3124 Aerospace Structures (C-) Pre: 3024	3	
AOE 3034 Vehicle Vibration & Control (C-) Pre: ESM 2304, MATH 2214		Choose one: AOE 3134 Stability Control (C-) Pre: 3034 AOE 4140 Spacecraft Dyn & Controls (C-) Pre: 3034, 4134	3	
AOE 4134 Astromechanics (C-) Pre: ESM 2304	3	CLE (Area 2, 3, or 7)	3	
TOTAL	18	TOTAL	. 18	
SENIOR FALL SEMESTER 2016	Credits	SENIOR SPRING SEMESTER 2017	Credits	
AOE 3044 Boundary Layer Theory Pre: 3014, MATH 4564, ME 3134	3	AOE 4066 Aircraft Design or AOE 4166 Spacecraft Design Pre: AOE 4x65	3	
AOE 4065 Aircraft Design (C-) or AOE 4165 Spacecraft Design (C-) Pre: 3054,3114, 3124, 3134	3	Technical Electives	6	
AOE 4154 Aero Engr Lab Pre: 3054, 3114, 3124, 3134 or 4140		Elective	3	
AOE 4234 Aerospace Propulsion Systems Pre: 3114, ME 3134	3		2.4	
Technical Elective	3		20	
CLE (Area 2, 3, or 7)	3			
TOTAL	16	TOTAL	. 12	

Junior/Senior (OE)

JUNIOR FALL SEMESTER 2015	Credits	JUNIOR SPRING SEMESTER 2016	Credits
MATH 4564 Operational Methods (C-) Pre: MATH 2214		STAT 4705 Probability & Stat for Engr Pre: MATH 2204	3
ME 3134 Fund of Thermodynamics (C–) Pre: MATH 2214		AOE 3054 AOE Experimental Methods (C-) Pre: 3014, 3024, and 3034	3
AOE 3014 Aero/Hydrodynamics (C–) Pre: 3104 or 3204, ESM 2304		AOE 3224 Ocean Structures (C-) Pre: 3014, 3204	3
AOE 3024 Thin-Walled Structures (C-) Pre: ESM 2104, ESM 2204		AOE 3264 Resist & Prop of Ships (C-) Pre: 3024	3
AOE 3034 Vehicle Vibration & Control (C-) Pre: ESM 2304, MATH 2214		AOE 4214 Ocean Wave Mechanics (C-) Pre: 33014, 4564	3
CLE (Area 2, 3, or 7)	3	AOE 4244 Marine Engineering (C-) Pre: 3024, ME 3134	3
TOTA	L 18	TOTAL	. 18
SENIOR FALL SEMESTER 2016	Credits	SENIOR SPRING SEMESTER 2017	Credits
AOE 3044 Boundary Layer Theory Pre: 3014, MATH 4564, ME 3134	3	AOE 4266 Ship Design Pre: 4265	3
AOE 4265 Ship Design (C–) Pre: 3054, 3224, 3264, 4214, 4244; Co: 4334	3	Technical Electives	3
AOE 4254 Ocean Engr Lab Pre: 3054, 3264	1	CLE (Area 2, 3, or 7)	3
AOE 4334 Ship Dynamics Pre: 3114, ME 3134	3	Elective	3
Technical Elective	6		8
TOTA	L 16	TOTAL	12

Curriculum for a Liberal Education, and Electives

- The CLE requirements are well-established
 - See Info Packet for details and recommendations.
- ECON 2005 is required for graduation and may be taken as one of the two Area 3 requirements in the University Curriculum for a Liberal Education
 - If you choose to satisfy Area 3 requirements with courses not including ECON 2005, ISE 2014 may also be used to satisfy this requirement but this requires additional credits.
- MATH ELECTIVE:
 - AE students must take either Math 4574 or Math/AOE 4404 or Statistics 4705 on an A/F basis
 - OE students must take Statistics 4705
- TECHNICAL ELECTIVES: requires 9 credits of technical electives, all of which must be taken on an A/F basis
 - Details are in Info Packet
 - Prior approval is required for courses not on the approved list

Pass/Fail and Electives

- For AOE majors all required AOE courses and all math, science and technical electives must be taken on an A/F basis
- The university requires that all CLE courses must also be taken for A/F credit
- Only "free" electives and courses offered only P/F may be taken P/F
- Acceptable technical and math electives are listed in your packets
- Substitutions may be made with the prior approval of your advisor in some cases

Senior Design

- In senior year, you are required to take AOE 4x65 and AOE 4x66, a two-course sequence in which you complete a group design project
 - AE students take either 4065-66, Aircraft Design, or 4165-66, Spacecraft Design
 - OE students take 4265-66, Ship Design
- AE students must make a junior-year decision:
 - Spacecraft Design requires
 AOE 4134 (Fall) and 4140 (Spring)
 - Aircraft Design requires AOE 3134 (Spring)

Double Majors and Two Degrees

- Many AOE students choose to earn a double major in the "other" curriculum in the department
 - Double major can require as little as two extra credits
 - Programs of study for double majors are provided
 - Double major receives a diploma in the primary program
 - Double major certificate is issued to recognize the second major
 - Both majors are indicated on the transcript
 - A graduate desiring two diplomas (called "two degrees") must take a minimum of thirty extra credits
 - Generally advisable to pursue a master's degree rather than "two degrees"
- Some students pursue second major outside department
 - Rare, typically involves significant additional coursework
 - AOE students have graduated with second majors in Math, Physics, English, Philosophy, Chemistry and other engineering
 - Generally better to pursue master's degree rather than second major

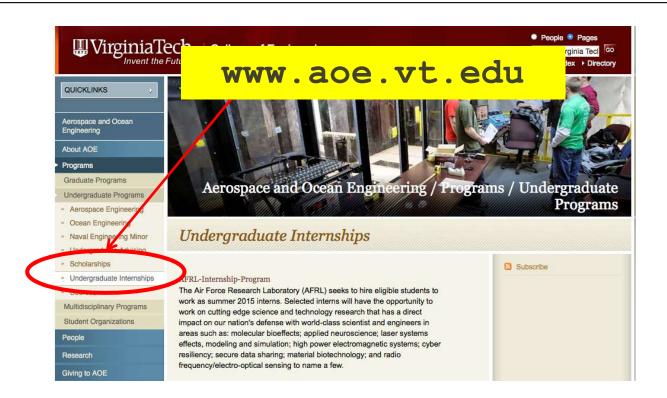
Minors

- Minors often require significant additional coursework beyond the 133 credits necessary to graduate and are not generally available in engineering majors
- Except a Math minor requires little additional study beyond required AE, OE math credits
 - Typically possible by judicious selection of one technical elective
 - Contact the Math Department for a list of minor requirements and for the forms needed to sign up for the minor
- Navel Engineering



Scholarships, Co-ops and Internships

- Many AOE undergraduates participate
- Your first step is to visit Career Services http://www.career.vt.edu/



Time To Graduate

- AOE curricula lead to graduation in four years (five years for Co-op students)
- Required junior and senior level AOE courses are only offered once per year, making it difficult to "stretch" the program over a longer period
- Some students enter the department later than normal or with fewer credits than normal and there are others who need to accommodate special programs such as ROTC or sports participation
- We will work with you to develop the needed schedule of coursework within the restrictions imposed by course teaching schedules, curricular and accreditation requirements, and elective availability
- If you drop a course that is a prerequisite course, that drop could extend your program by a full year

Sample Curriculum Problem: Cost of Dropping AOE 3014 in Junior Fall

Given: You are a junior in AE. In the fall semester you decide to drop AOE 3014, Aero/Hydro. Furthermore, you do not speak with your advisor about this decision. Determine the consequences of this action, particularly the cost.

Facts: AOE 3014 Aero/Hydro is a prerequisite for the following AOE courses: 3054, 3264, 3114, 4214, 4334. AOE 3054, 3114, 3264 and 4214 are in the Junior Spring Semester. AOE 3054 and 3114 are prerequisites senior AE classes. AOE 3054, 3264 and 4214 are prerequisites for senior OE classes. All of these courses are only offered once per year.

Consequence: You cannot take AOE 3054, 3114, 3264 or 4214 in Spring. You must wait until *next* Fall and take AOE 3014. You can then take AOE 3054, etc. the following Spring, in what *would have been* your last semester. However, since these courses are prerequisites for senior courses, you would not yet have taken all your senior courses.

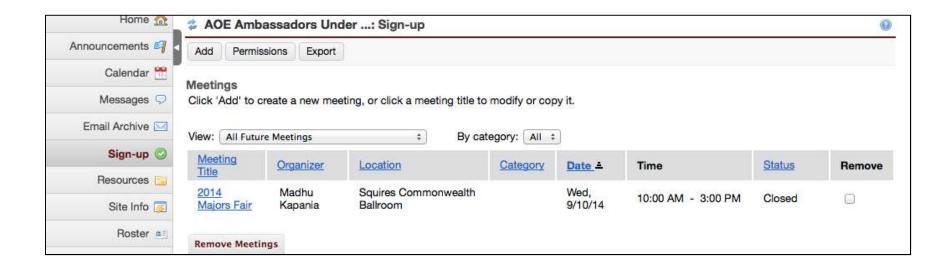
The end result of this chain of events is that you will need another entire year to obtain your B.S. degree. The \$ cost therefore is the cost of tuition, room and board for an additional year. In addition, there is the opportunity cost of another year of not earning the \$50,000-\$60,000 per year that AOE graduates typically earn after graduation.

Lesson: Speak with your advisor and/or with Ms. Kapania before dropping any courses.

Extracurricular Activities

- AIAA (American Institute of Aeronautics and Astronautics) is aerospace engineering professional society
 - Our student branch is among the largest and most active in AIAA
 - Activities include regular meetings, a regional paper competition and design competitions
- SNAME (Society of Naval Architects and Marine Engineers) is professional society for Ocean Engineers
 - Our student branch is very active and successful in SNAME national programs and design competitions
 - Members hold regular meetings and travel to the SNAME national meeting
- ΣΓΤ (Sigma Gamma Tau) is the national Aerospace honor society
 - Each semester the chapter selects the top AE and OE juniors and seniors for membership

AOE Ambassadors



More Extracurricular Activities

- Design-Build-Fly
- Human-Powered Submarine
- Autonomous Underwater Vehicle
- Sounding Rocket Project









AOE Undergraduate Program Bottom Line

- Take charge of your career now.
- Take responsibility for your curriculum
 - Read and know the info in your packet
 - Meet your advisor
 - Seek advice from us!
- Get involved
 - Student chapters
 - Student vehicle projects
- We are here to help you succeed, but you have to do the work