

**ENGINEERING
AND
MATHEMATICAL SCIENCES
PROGRAM**

ACADEMIC YEAR 2011-2012

PROGRAM DIRECTORS

Patrick Lombardo

Class of 2014

College of Engineering and Mathematical Sciences at the University of Vermont

Major: Environmental Engineering

College of Engineering and Mathematical Sciences at the University of Vermont

Minor: Math

Living and Learning Center Box 292

633 Main Street

Burlington, VT 05405-0385

Phone: 978-503-9959

Email: Patrick.Lombardo@uvm.edu

Theresa Givens-Mauldin

Class of 2014

College of Engineering and Mathematical Sciences at the University of Vermont

Major: Math

Mercy 305

250 Colchester Avenue

Burlington, VT 05405

Phone: 202-213-3251

Email: tgivensm@uvm.edu

INFORMATION ABOUT THE STUDENT(S) PROPOSING THE PROGRAM

Patrick Lombardo

1. I have decided to re-propose the Engineering and Mathematical Sciences program because I feel that based upon my experience in the suite in the academic year 2010-2011 that my success at UVM has been expanded. Not only does the engineering suite help build lifelong friendships, the suite helps to further learning by simply being around a diverse group of engineers that share similar passions. Whether its homework help or small talk, a lot can be learned from living with other students with similar majors and similar career goals in mind. With the extra knowledge I learned last year in the engineering suite in areas of calculus, engineering concepts, and chemistry I feel that I am qualified to pass down that knowledge to others that enter the suite next year.
2. As a student of the engineering and mathematical sciences program, I have learned about the importance of engineering in a world that strives for sustainability. I have also learned about the importance of implementing engineering concepts, such as sustainability through solid leadership. I have acquired teamwork skills over the years that I can use to help the engineering suite(s) work together. As a real world engineer, teamwork skills are of the most important, and I am ready to pass down my knowledge of teamwork to those who enter the suite next year. As a team of aspiring engineers, we can as a group learn more from one another, and be more successful in accomplishing our goals at UVM.
3. As a learner myself, I know how important it is to learn from others, that is particularly why I chose to lead the engineering suite in the year to come. Not only will I aid others in subjects such as chemistry, math, physics, and ENGR, I can further my knowledge by helping others, and keeping an open ear to new ideas. This is what engineers do; they build off of others ideas to propose the best possible design. The living and learning engineering suites provides a network of ideas to further ones thoughts, and expand each other's realm of possibility. Thus, as an engineering student I can further my knowledge in the field of engineering through networking with incoming students with creative ideas.
4. Being a leader in the Living/Learning community I hope to gain skills in both learning from others, but also further develop my skills in time management. With an environmental engineering major and math minor my time is limited, and I am up for the challenge of balancing my time with school work and leadership/planning.
5. Apart from school related activities I have grown a passion for bouldering, and regularly visit the bouldering facility in the Patrick Gymnasium. I also enjoy skiing, which I practice regularly with the UVM freestyle ski team. Hopefully next year I can become a part of the recycling club, which is something that I have also been passionate about since the beginning of my high school career. Through out the year I hope to give back to the engineering suite what it has given me this year with the help of previous encouraging and knowledgeable program directors; Max Mazel and Kasey Cybulak.

Theresa Givens-Mauldin

1. I wanted to re-propose the Engineering and Mathematical Sciences program because I feel it fosters a great environment for students to live and foster their engineering and math skills. Having gone to boarding school I know that living in a suite allows you to really get to know people, but it also allows you to have people to bounce ideas off of when you're studying or writing a term paper. In both engineering and mathematics students must work together and I believe that the suite helps cultivate that skill in its students.
2. Having lived in a dorm before I understand the importance of both personal space and communal space. Through dorm life I believe I've learned how to be an intermediate between suite mates. I feel if a problem ever arises I would be able to handle the situation. After years of playing on teams I feel I'm a great team leader and would be able to lead the suite and still be a member of the engineering community. I feel I would be able to help my suite mates understand the importance of working together in the suite and in their specific fields of study.
3. Being a student I understand how much a group environment helps people learn. Having a communal learning space will allow for me to help others, but also allow others to learn from me, whether it be in math or English. The Engineering and Mathematics Suites provides a community for students in the suite to converse about different ideas and theories. I think the suite will be a great place that will help foster confidence in the engineering and mathematics students.
4. By living in the Living / Learning community expect to become more confident in my math skills just through studying and conversing with my suite mates. I also plan to better develop my leadership skills and my organizational skills through planning activities in the suite.
5. Besides school activities I am an active member on the Black Student Union. I enjoy having a mini community within the larger UVM community, and planning events for both the club and the whole community. I also enjoy basketball and soccer, and love to start a pickup game on weekends. One of my other favorite activities is ceramics and hopefully I can put in some time in the wheel this semester.

ENGINEERING AND MATHEMATICAL SCIENCES

I. OVERVIEW

The purpose of the Engineering and Mathematical Sciences program is to encourage academic success, while intellectually stimulating its members and providing opportunities to establish a firm grasp on the concepts of engineering and mathematics in the real world. The program will enhance academic achievements as well as allow undergraduate students to take advantage of the resources that returning students have gained through their own academic and real world experience. Within the program community there will be plenty of opportunities for peer academic advising. Teamwork will develop with academic group study sessions, and by clearly communicating academic and social issues to the program community so a resolution can be found. Members will acquire a strong social atmosphere by means of events which include, but are not limited to, program meetings, program events, and field trips.

II. LEARNING OBJECTIVES

LEARNING OBJECTIVE 1

Each member will be exposed to the work that individual practicing engineers, mathematicians, or computer scientists in their respective fields do every day.

ACTION STEPS

- A) Members will attend lectures presented by guests-- an example being the University of Vermont professors and visiting professors through the Engineering and Mathematical Sciences department.
- B) Members will present their own projects on topics of interest from their own classes or personal research. At program meetings, members will discuss interesting aspects of their major that they have recently learned or discovered. Members can make suggestions of things to do as a group that are of interest to them.
- C) Members will attend field trips to local sites of interest pertaining to Engineering and Mathematical Sciences such as the Olympic Stadium in Montreal. We may need transportation to these events, unless the suitemates have transportation of their own in which we could carpool. These trips may also require admission into the facilities. Most of these will not require any fee, but the Ben and Jerry's Factory tour is \$3.00 per person, totaling \$36.00 for the program.

LEARNING OBJECTIVE 2

Enhance the quality of education obtained by the members by assisting fellow classmates with their academic endeavors. Teamwork, which is emphasized in the practical applications of engineering and mathematics, will be practiced from the beginning.

ACTION STEPS

- A) Members will utilize the multitude of talents and accomplishments that can be found in the other members of the program. Being surrounded by members who are also fellow classmates can offer helpful advice about classes as well as learn together.
- B) Members of the program will be available to assist other members with classes in progress as they live in the same community by utilizing resources and knowledge from classes previously taken and experiences within clubs.
- C) Members will be available to advise other members on which classes to take by giving a personal opinion of the class in question. This will allow a clearer picture of the class objective and curriculum than what is presented in the course catalogue.
- D) Study groups will be established as soon as classes begin in order to stress the importance of the benefits of teamwork in a group learning atmosphere. This will allow students to reap the benefits of the knowledge and information that each member possesses. Group study reinforces teamwork, a skill that is paramount for any job in a science related field.

LEARNING OBJECTIVE 3

Understanding the process and value of teamwork. Each member is important to the team; the more involved a member is to their academic study sessions and the program, the more certain is their academic success.

ACTION STEPS

- A) Meetings will be held to discuss and analyze the quality, success and effectiveness of the group study sessions, and a group discussion will be held in which to brainstorm ideas of how to make the study sessions more productive and helpful to all the members. Upcoming important dates will be announced to remind members of event deadlines and our program advisor, Joan M. Rosebush, will hold a group consultation to see how everyone is handling the workload and give advice on how to succeed academically. We would like to purchase snacks for these meetings. Chips and Drinks from the Marche for 12 people will cost roughly \$15.00.

- B) Team building exercise will be implemented and executed at the beginning of the semester to build friendships and a team atmosphere among all of the members of the program.
- C) Members will hold study sessions to engage students outside of the program and to promote academic success as a whole.

LEARNING OBJECTIVE 4

Better understanding of individual learning styles and capabilities and involvement with the outside community.

ACTION STEPS

- A) The program will encourage all members to evaluate their learning styles and capabilities. Teamwork is a wonderful way to learn the material, as is studying on one's own. The self discipline to study by one's self is an attribute that each member will find useful when other members cannot assist them with the topic on hand. Members will implement and observe set quiet hours for self study and group study sessions in available classrooms.
- B) Faculty members who specialize in different learning styles will speak to the group in order to educate all the members on the numerous learning styles, study skills, and types of collaborative learning to practice in different subject areas.
- C) Activities such as bridge building competitions or pine wood derby car races to be held in the FPL will be ways in which the suite can promote teamwork and awareness of different learning styles. **We would need funding to purchase the supplies for our bridges or model cars. The bridges would be constructed out of popsicle sticks and glue, which are all inexpensive. Total cost for popsicle sticks and glue will be \$15.00**

All of the program meetings planned will take place on a monthly basis, and will be dependent on the schedule of the program members, and the schedule of the program advisor, Lecturer Joan M. Rosebush. Group study sessions will begin as soon as classes begin.

III. COMMUNITY SERVICE

Members will leave the University of Vermont in better condition than it was when they first saw it. An important part of maturing into an adult and preparing yourself for the “real world” is the ability to give back to the community, and to enrich it for the next generation.

- A) Members will volunteer to assist at the College of Engineering and Mathematical Sciences sponsored events, which include high school science fairs and competitions, as well as events in the Burlington area that may benefit the members.
- B) Each member will find a community project to participate in, whether it is Habitat for Humanity, Earth Day, or volunteering at a soup kitchen.
- C) Each member will be urged to participate in Shades of Ebony, a tutoring service for underprivileged children held at Burlington High School.

IV. PLANNING TIMELINE

See the attached planning timeline for a detailed schedule of the Engineering and Mathematical Sciences Suite activities. Please note that some of the scheduled events are tentative and will be rearranged to accommodate the needs and keep in mind the schedule of the members of the program. Such flexible events are when self study hours, group study hours, meetings with Dr. Grasso, and program meetings are held.

V. PROGRAM ADVISOR

Joan M. Rosebush, Mathematics Lecturer in the College of Engineering and Mathematical Sciences, has agreed to serve as our program advisor. Her email address is jrosebus@cems.uvm.edu. She is an extraordinarily helpful person and is well respected amongst the College of Engineering and Mathematical Sciences.

VI. PUBLICITY PLANS

The guest speakers that come to address the students, staff, and faculty and any program events that are planned will be advertised through the use of flyers around Billings Student Center, Votey, and the Living and Learning Center, and by means of the Living and Learning Center news email and the University of Vermont’s student newspaper *The Cynic*. Also, our meetings/presentations with Dr. Grasso are open to L/L residents and any willing UVM student. This will allow others outside of the suite to learn about the work we aspiring engineers will do. Study sessions and other activities run by the Engineering and Mathematical Sciences Suite will be advertised this way as well.

VII. SPECIAL FACILITIES REQUEST

The Engineering and Mathematical Sciences program wishes to be located in a column where there is ample study space for use of study sessions to be overseen by the members of the Engineering and Mathematical Sciences program, and to assist the University of Vermont affiliates with any course material we can lend our knowledge to.

VII. PROGRAM HOUSING REQUEST

The Engineering and Mathematical Sciences program wishes to request three suites, in order to accommodate both the returning members of the program, and allow space for new members that are already enrolled in the College of Engineering and Mathematical Sciences at the University of Vermont, as well as incoming first year students. With growing interest each year, we would like to expand the program. We enjoy the D or E column (away from the Marche loading dock), and we liked being in the same column as the Animalia suite, because it was a quiet atmosphere that is good for studying. We would greatly appreciate to be placed all on one floor, and because of the rigorous academic schedules that all of our members will have, we need a column that will provide ample study space at a variety of times. We do expect there to be coeducation suites because of the balance of both male and females in the related fields.

VIII. PLANS FOR INTERACTIONS WITH OTHER L/L PROGRAMS

The Engineering and Mathematical Sciences program plans to interact with other programs by advertising other programs' activities within our own living community. We will show support for other programs by attending and actively participating in as many of these activities that we can. We will co-program with as many of these events as we can, lend support, give help, and lend materials where we can. The Engineering and Mathematical Sciences suite plans to do a potluck brunch or pancake breakfast on Sundays once a month as a social event and bonding experience between members of the column. Any events that the program does, for example, an egg drop from Cook Science building, and testing the compressive and tensile strength of a Nalgene bottle in the Votey steel lab in Votey 112 is open to all members of Living and Learning and the University of Vermont. We also hope to work with the cooking suite to celebrate Pi day, (March 14), by having a pie-eating contest which will be open to any Living and Learning resident.

We also hope to work on non-engineering events, such as serving brinner (breakfast/dinner) for everyone in the Fireplace Lounge to try to raise money for a local charity, such as the King Street Youth Center. We also would like to meet with Dr. Hines, who will talk to us about alternate energy. From there we could pass on our knowledge of that subject to the Living/Learning Community through a dinner at the fireplace lounge followed by a presentation.

New this year the engineering suite will be working with Dr. Grasso, Dean of the College of Engineering and Mathematical Sciences. Dr. Grasso has accepted the offer to work

with out program this year in teaching us about how our work as engineers effects our environment, and the earth as a whole. His teachings will accommodate all engineers in our suite as well as environmental scientist, business majors, and sociology majors. The style of our work with Dr. Grass will include but is not limited to small group question and answer sessions, and even a larger group presentation that every L/L member will be invited to. This will get other suites to see what our interests are all about, learn from Dr. Grasso, and maybe even gain interest in our program. This is truly a great way for us engineers to learn from someone who has an engineering degree, as well as a great way for others who do not know much about the profession to learn something about our interests.

Our time with Dr. Grasso is limited to the time Dr. Grasso has to offer. Since he is very busy we will work around his schedule to plan meetings with him and with the L/L community. I personally will be in contact with Dr. Grasso through the semester to plan times where we can meet with him and discuss what knowledge he wishes to share. Some of that knowledge will include information on environmental contaminants, human health and natural resources, and his work with the Environmental Protection Agency.

VIII. PROGRAM MEMBER RECRIUTMENT

Some of our current program members and fellow classmates have expressed an interest in returning to the Engineering and Mathematical Sciences program. The Engineering and Mathematical Sciences program will be advertised during the engineering and mathematics classes located throughout campus, the Program Fair, our Engineering and Mathematical Sciences webpage (if one is created), on flyers through highly populated student areas, and during New Student Orientation.

This year the engineering suite will look to broaden its pool of members to include environmental scientists, both B.A. and B.S. engineering students, and sociology majors just to name a few. Ultimately we would like to tie most if not all majors together to further understand how each of our work ties together. Any and all majors are welcome to apply under the condition that they have interest in our program and its goals. This also improves our inter-suite diversity, which creates a better learning environment. In real world situations engineers and other professions work together as a team to overcome a problem. We are trying to simulate this real-world situation in our suite to better understand the work we will be dealing with every day outside of UVM.

ENGINEERING AND MATHEMATICAL SCIENCES
Timeline Explanation

1. **Program Meetings with Joan Rosebush** are structured meetings focused on academics and participation in engineering and mathematic related activities on and off campus. Attendance is mandatory unless a valid excuse can be provided such as another academic event conflicts with the meeting time like an evening lab. **I would like to have snacks and drinks and/or pizza for these events. Cost for the food would be ~\$30.00.**
2. **Quick Unofficial Meetings** are meetings run by just the program directors to inform and/or remind program members of important dates, events and ideas about group gatherings. These meetings are more casual and are not mandatory, however, it is highly recommended that program members attend these meetings.
3. **Group Study Sessions** on the timeline refer to study sessions with other program members in the same classes to review the course material. Over the course of the entire semester, program members are supposed to on their own time get together with other program members and study in groups. At the start of the semester, everyone will bring their schedules and decide amongst themselves which days and time frames work best for them to study in small groups. Since students' lives can be very hectic and schedules change, the only Group Study Sessions that is set in stone on the timeline are the ones right before finals. Members are not required to attend study sessions, but they are highly encouraged. We know that people have different ways of studying, and many study best alone.
4. **On-Campus Activities** include having a monthly movie night where members of the program can gather and relieve stress from academics. Movie nights would be held on Thursday of Sunday evenings when the classroom below the D-building is available. This will also provide great opportunities for bonding and for everyone in the program to get to know everyone better. **Total Cost for movies is free.**
5. **A Halloween Party** is a perfect way to again step away from stress causing academics and bond as a suite. The rooms shall be decorated with appropriate Halloween decorations and each member of the Living/Learning community will be invited to the engineering suites on Halloween. **Costumes, beverages, and food will need to be supplied as well as decorations. Approximate cost ~\$60**
6. **Possible Field Trips** are going to
 - a. *IBM*: Essex Junction, VT
 - i. IBM is a multinational computer, technology, and IT consulting corporation. Computer scientist and Electrical Engineers especially would be perfect candidates for employees of this company. Classes such as software engineering, computer programming, and

communication systems offered at UVM deal directly with the work done at IBM. Thus it would be worthwhile for the engineering suite to take a tour of what might be some of our future employers. Again one of the purposes of this program is for its members to be exposed to the work that they will be doing outside of school.

- b. *Husky Injection Molding*: Milton, VT
 - i. “Husky Injection Molding Systems is one of the world's leading suppliers of injection molding equipment and services to the global plastics industry.” This company offers positions pertaining to mechanical engineering especially, as well as civil engineering, and general engineering. Classes such as ME 162, modern manufacturing systems would be directly tied to the work that Husky Injection Molding does everyday.
- c. *Tri-Angle MetalFab*: in Milton, VT
 - i. This company is one of the leaders in the aerospace manufacturing industry. Majors such as mechanical engineering, general engineering, and electrical engineering would be particularly interested in this trip. Classes including materials science, mechanics of materials just to name a few directly correlate to the work that Tri-Angle MetalFab does. Students graduating with various engineering degrees may look to this company for employment, thus it would be a great idea to see this company and industry first hand.
- d. *Ben and Jerry's Factory Tour*: Waterbury, VT
 - i. Ben and Jerry's factory has a top of the line ice cream production center. Our program would take a tour of the company's headquarters to see the machines involved with production of ice cream. Classes such as mechanics of materials and systems directly correlate to the production process that Ben and Jerry's carries out every day. Although an engineering major may not work for Ben and Jerry's directly, the work done on the machines and the science behind the systems involved are the job of engineers.
- e. *Burton Factory Tour*: Williston, VT
 - i. Burton Snowboards is a unique company that designs, manufactures and distributes top of the line snowboards to locations around the world. Burton hires employees of the following degrees either to work directly with their company or to install and update their equipment: mechanical engineering, environmental engineering, environmental science, civil engineering and many more. Our program will be touring the Burton facility and guided through their design and construction process as well as viewing the various tools and equipment used in the production process.

These companies are relatively close to campus, and are companies that have hired University of Vermont students in the past. They all have some form of relationship with the University of Vermont, whether it is clubs, lectures, or other events. **Other than Ben and Jerry's (\$36.00 for 12 people), these field trips will only require transportation to the facilities. If no suite-mates have cars of their own for carpooling, we will need vans for transportation.**

7. **Engineering and Mathematical Sciences Webpage** will be created amongst the members of the suite and updated weekly to inform the UVM community what us engineers plan, and are planning. This is a good way for any computer science majors in the suite to practice their specialties as well as let the community see our events making for a better outcome. This is also a good way for students who are interested in the program see more in depth what the suite is all about. **The cost of creating a webpage is free using the UVM servers.**

ENGINEERING AND MATHEMATICAL SCIENCES

(Name of Program)

PLANNING TIMELINE - FALL SEMESTER 2011

<p>PRE-SEMESTER</p> <p>Student Program Directors Arrive Early</p> <p>Orientation and Training Workshop</p> <p>Classes Begin: Monday, August 31</p>	<p>OCTOBER 26 - NOVEMBER 1</p> <p>On Halloween have a horror movie night to de-stress after midterms, eat pizza and ice cream. Invite other L/L programs to enter our suite to see Halloween decorations. Discuss next volunteering activity, and implement it.</p>
<p>AUGUST 31- SEPTEMBER 6</p> <p>Labor Day: Monday, September 7</p> <p>Program Meeting with Joan Rosebush to officially welcome everyone into the program, the Living and Learning Community, and the University of Vermont. Attend the Engineering and Mathematics barbeque on the CBW Green and mingle with other Students in the College of Engineering and Mathematics.</p>	<p>NOVEMBER 2 - 8</p> <p>Program Meeting with Joan Rosebush to discuss the suite's involvement in extra-curricular activities thus far. We will discuss all of the options within engineering for clubs such as AERO, SAE Baja, EWB (Engineers without Borders), as well as any others that the suites have heard of or participated in. I will urge everyone to get involved because the clubs are not only educational, but incredibly fun.</p>
<p>SEPTEMBER 8 - 13</p> <p>Decorate the suites with engineering related material, set ground rules, review everyone's schedules and determine group study hours, and "suite quiet hours". Remind everyone that September 14th is the last day to ADD/DROP a course with no penalty, and order solution's manuals for corresponding text books. Cleaning schedule (bathrooms and common area).</p>	<p>NOVEMBER 9 - 15</p> <p>Quick unofficial gathering to remind program members that registration is coming up and to make sure student accounts have a balance of zero, they have talked to their advisors, and they set their alarms to be up by 7:00 am registering time to avoid stress and registering holds.</p>
<p>SEPTEMBER 14 - 20</p> <p>Quick unofficial gathering to check up on how everyone is handling their courses, remind members of SI sessions, the Learning CO-OP, and tutoring services that are offered at the University of Vermont. Elect a member to be on the Living and Learning Community Council. Review the University of Vermont lecture series, and plan to attend. Members get a surprise if they attend all of the lectures on the list.</p>	<p>NOVEMBER 16 - 22</p> <p>Decorate the suite for autumn and update the display case in the Fireplace Lounge with a winter theme. Remind everyone that finals are fast approaching. Determine more study groups within and outside the Engineering suite to get everyone working together on studying. Determine and stick to designated "quiet hours" and studying times.</p>
<p>SEPTEMBER 21 - 27</p> <p>Program Meeting with Joan Rosebush to discuss how the first set exams went for everyone, and reiterate that tutoring help is available. Inform program members of the club and organizations the Engineering and Mathematics College has to offer - ASCE, ASME, IEEE, CSSA, SWE, etc., and encourage involvement with these clubs.</p>	<p>NOVEMBER 23 -29</p> <p>Thanksgiving Recess: November 23 - 27 Happy Thanksgiving!</p>
<p>SEPTEMBER 28 - OCTOBER 4</p> <p>Take pictures of program members and update webpage, and decorate the display case in the Fireplace Lounge with interesting information and contact information about the program. Do the limited material robotics race in Living and Learning Fireplace Lounge open to all University of Vermont affiliates.</p>	<p>NOVEMBER 30 - DECEMBER 6</p> <p>Mandatory study sessions with program members in your same classes, and mandatory self study time. Attend the de-stressing activities provided for students by the Living and Learning Center. Attend the Design Technology and Science Connection competition if one still exists. Get lots of sleep and get ready for exams.</p>
<p>OCTOBER 5 - 11</p> <p>Program Meeting with Joan Rosebush to discuss field trip possibilities, and discuss a possible date that is convenient for everyone. Discuss group volunteering activity, and implement it.</p>	<p>DECEMBER 7 - 13</p> <p>Do a full winter cleaning of the suite, congratulate everyone on a semester well done, pack, and celebrate with Ben and Jerry's ice cream, and some movies.</p>
<p>OCTOBER 12 - 18</p> <p>Quick unofficial gathering to remind program members of last day to withdraw date on November 3rd, and remind members to meet with their academic advisors to make out their schedule for next semester before they go to register.</p>	<p>END-OF-SEMESTER:</p> <p>Classes End: Thursday, December 10 Reading Days: December 12-13, 16 Exam Days: December 10, 11,14-15,17</p>
<p>OCTOBER 19 - 25</p> <p>Decorate the suites for Halloween, and enter our doors in the Halloween contest that is held each year by the Collegiate 4-H program, if held again. Attend the Career Fair.</p>	<p>Winter Recess:</p> <p>Winter Recess: December 19 - January 17</p>