Proposed Of A New Undergraduate Or Graduate Program

This document should not exceed 3-5 pages in length.

1. Proposing College / School: College of Engineering

2. Proposed Program Title: Tribology Minor

3. CIP Code of Proposed Program: NA

4. Proposed Implementation Date: 8/16/2012

5. Relationship of Proposed Program to the Auburn University Mission Statement and Strategic Plan:

(Auburn University’s mission statement may be accessed at the following site: http://www.auburn.edu/administration/trustees/policymanual/vision_and_mission.html; Auburn University’s strategic plan may be accessed at the following site: http://ocm.auburn.edu/strategic_plan/)

The addition of a Tribology Minor follows the University’s mission to provide undergraduates with a high quality education in an area of high importance to the state and nation. Tribology is the study of lubrication, friction and wear and so is of great importance to improve the energy efficiency and life of all vehicles and machinery. Tribology is extremely important for practically all industries, including automotive, agriculture, manufacturing, energy, biomedical, etc. Tribology is also a complicated multidisciplinary field that interfaces between areas such as chemistry, fluid dynamics, thermodynamics, mechanics and also requires a business acumen for graduates to succeed in the field. Currently, there is no undergraduate Tribology minor or specialization offered at any US university, although there are single Mechanical Eng. courses (not multidisciplinary). The India Institute of Technology (Dehli) offers the only comparable program. Due to the gap in the educational curriculum, industry and students have shown great interest in creating a tribology minor, as well also be discussed in item #15. We have received overwhelming support from corporations and individuals in the industry. They have pledged that they will provide funding for student scholarships once the minor is in place, as noted in item #15. We have also received support from several professional societies and trade organizations, some of whom have scholarship programs in place that have been offered for use to fund Auburn students enrolled in the minor.

6. Expected Program Outcomes and Assessment Methods:

(Expected outcomes must be stated clearly and must include student learning outcomes and an assessment plan for ascertaining the extent to which the expected outcomes are achieved and for designing improvements based on analysis of assessment results.)

Expected Program Outcomes:
Students completing the minor will:
1. Gain a multidisciplinary appreciation and broad understanding of the field of tribology (friction, wear and lubrication) especially in the subjects of engineering, chemistry and business.
2. Acquire skills necessary to identify critical parameters in a tribological system.
3. Make predictions of the performance and behavior of a tribological system based on these critical parameters.
4. Have the necessary tools and skills to design a tribological system for the needs of a specific application, including geometry, lubricant, and surface properties.
5. Have the necessary tools and skills to improve the properties of an existing machine component surface or lubricant to improve reliability.
6. Understand the chemical formulation and operating mechanisms of lubricants and additives.
7. Be familiar with a number of common mechanical systems and applications which rely heavily on adequate tribological performance.

Assessment Methods:
1. Students will be tested on their learning and retention of the above outcomes based on individual course assignments, presentations and testing.
2. An external advisory board is currently being organized to give feedback regarding the minor and help guide it into the future. We have already received several positive responses to invitations to serve on the committee from well known individuals in the field.
3. Feedback will be provided from industrial and individual sponsors of the minor.
4. Auburn alumni in the field will be contacted to provide feedback on the minor.
5. Upon completion of the minor, students will also fill out an exit survey with questions about their experiences, job placement, and possible suggestions for improving the minor.

7. Degree Requirements (Including All Formal Options):

(For programs at the undergraduate level, please provide a curriculum model for the program as well as for each formal option.)

The minor will provide engineering students at Auburn with the opportunity to acquire a more in depth knowledge of tribology before entering the work force. The students will be required to complete a set list of core courses as shown below. They will then also have the freedom to choose two or more additional courses which could help them specialize in one or more areas of tribology. The required courses are all officially numbered and offered courses, however, some of the elective courses are ***5970 trial courses that may not always be offered. Additional elective courses may also be added to the minor in the future as they become available.

Total Course Hours: 15

Required Courses +:
MECH 5230/6230 HR: 3 Friction, Wear and Lubrication
PFEN 5910 HR: 3 Rheology
CHEM 2080 HR: 3 Organic Chemistry or CHEM 2030 HR: 3 Survey of Organic Chemistry

+ Students are required to take all courses, but cannot count them toward the minor if they are used for their major degree (only free electives can be used). Therefore if a course is already used for a student's major, then another course from the electives below will be used to reach the required 15 hours.

Elective Courses (add until 15 hours counting toward Minor are reached):
BUSI 3510 HR: 3 Introduction to Business and Engineering
MATL 5600 HR: 3 Corrosion
MECH 5240 HR: 3 Hydrodynamic Lubrication
CHEN 5660 HR: 3 Macro. Assembly & Application of Nanomaterials
CHEM 5520 HR: 3 Surface Chemistry
MECH 5270 HR: 3 Metalworking and Manufact. Trib.
MECH 5970-009 HR: 3 Multiscale Contact Mech.

8. Specific Admission and/or Continuation Requirements:

All AU students in good academic standing will be eligible to take the minor as long as they fulfill the necessary prerequisites for each course, and show the necessary technical background and skill.

9. Existing Courses and New Courses Required:

Existing Courses:
MECH 5230 or 6230 HR: 3 Friction, Wear and Lubrication
CHEM 2080 HR: 3 Organic Chemistry or CHEM 2030 HR: 3 Survey of Organic Chemistry
BUSI 3510 HR: 3 Introduction to Business and Engineering
MATL 5600 HR: 3 Corrosion
CHEN 5660 HR: 3 Macro. Assembly & Application of Nanomaterials
MECH 5970-009 HR: 3 Multiscale Contact Mechanics

New courses seeking approval:
PFEN 5910 HR: 3 Rheology
MECH 5240 HR: 3 Hydrodynamic Lubrication
MECH 5270 HR: 3 Metalworking and Manufact. Trib.
CHEM 5520 HR: 3 Surface Chemistry (Pending at the Chemistry Department Level)

10. Relationship of Proposed Program to Other Auburn University Programs:

(If "yes" for either item, please provide explanation in the space provided below.)

Will the program support or be supported by other program(s) at Auburn University? ○ Yes ○ No

Will this program replace any existing program(s), or specializations / options / concentrations within existing program(s) at Auburn University? ○ Yes ○ No
11. New or Additional Resources / Resource Shifting Required:
(If "yes" for any item, please provide explanation in the space provided below.)

- Will additional faculty lines be required?  Yes No
- Will new or additional space (e.g.: laboratory or classroom) be required?  Yes No
- Will additional library resources be required?  Yes No
- Will additional GTA support be required?  Yes No

Explanation of or provision for new or additional resources / explanation of program's support or replacement of other programs:

Item #10: Since there may be a few additional students in some existing courses, we have also received approval and support for the minor from many departments, including Chemistry, Fiber and Polymer Engineering, and Mechanical Engineering. A memorandum of understanding has also been established between the tribology program and the business engineering program so that a set number of tribology students will be able to enroll in BUSI 3510.

Item #11: There is a very minimal need to shuffle any resources. All the required courses are now offered on a regular basis, and all departments offering them approve having a few extra students. Most of the electives are also regularly offered, but a few might need to have faculty time put toward them to be taught every two years, if the demand arises. We are already starting to generate funds to address this, but it is not required for the minor to be offered.

12. Potential Duplication of Other Programs in the State:
(If the program would overlap with or duplicate a similar offering at another institution in the state, articulate the program's necessity and/or any differences from similar programs.)

None.

13. Collaboration With Other Institutions:
(Indicate whether or not the proposed program will -- either immediately or in the future -- involve collaboration with other post-secondary institutions. If so, provide all relevant details.)

NA.

14. Distance Education:
(If Distance Education will be incorporated in the delivery of the proposed program, provide details of implementation, scope, etc.)

NA.

15. Documented Need for Proposed Program:
(Elaborate upon the methodology used to appropriately assess regional, state, or national need and/or student demand for program.)

Many professional societies, individuals and industrial corporations have been strongly supportive of the proposed tribology minor. Initial commitments in the form of funds and equipment have already been made and total to approximately $45k. This number will grow very significantly once the minor is officially approved. The Society of Tribologists and Lubrication Engineers (STLE) is interested in officially endorsing the minor. The Independent Lubricant Manufacturer’s Association (ILMA) has offered to allocate existing ILMA scholarships toward Auburn Students in the Tribology Minor. ILMA also plans to publish an article about the new minor in their trade magazine. We have also received initial support from the National Lubricating Grease Institute (NLGI) and the American Society of Mechanical Engineers (ASME).

A poll was also given to students in the 2010 Fall Semester Introduction to Engineering course (ENGR 1110) that is taken by all engineering students during their first year. A total of 287 students answered the poll (111 Mechanical Students, 62 Chemical Students, 12 Biosystems Students, 29 Industrial and Systems Students and 73 other engineering students). In summary, well over 50% of all polled students expressed interest in the minor, no matter their major. In fact, nearly 77% of all students expressed interest in the minor if a $1000 scholarship is offered. Also note that offering a $1000 scholarship increased the number of Extremely Interested responses by 9.4%. In addition, there are currently 48 students in Dr. Jackson’s Friction, Wear and Lubrication class (MECH 5230) and it is in high demand every semester.
16. Employment Opportunities:

(Provide specific examples of employment opportunities anticipated for graduates of the proposed program.)

Today the North American Lubricant market is being served by over 250 domestic manufacturers and marketers that produce the majority of the 2.7 Billion gallons of various lubricants required to run the machinery that drives our economy. Most of these suppliers have requirements for technically proficient sales, marketing and technical service positions to support their business. Having graduates with a working knowledge of both the technical and business (BET) aspects of the industry places them at the top of future employment opportunities within this important field.

Raw material suppliers of the additives and base oils that are necessary to formulate the 2.7 Billion gallons generally require an even greater technically disciplined individual. One Executive VP of a major North American based global lubricant additive company, when asked about his view of a proposed Tribology Program at AU, observed that it would make his HR needs more simplified in the future. In his own words, “I’ll just look to Auburn first for my future technical employment needs.”

The industry is also a mature industry from a personal standpoint, whereas estimates of up to 40 % of the technical, operational and business management elements currently in place will be retired within ten years. Graduates of the Auburn Tribology program will be poised to become futures leaders within this vital industry. As a result, these industry leaders will be more inclined to add even greater support to the overall TLSP infrastructure.
Dr. Jackson,

I am writing to confirm that the Department of Chemical Engineering supports the enrollment of tribology minor students in Virginia Davis’ CHEN 5660 Macroscale Assembly & Applications of Nanomaterials course. I appreciate your sending me the information about the Tribology Minor and I will share this with our faculty with your approval.

Sincerely,

Chris Roberts

Christopher B. Roberts
Department Chair & Uthlaut Professor
Department of Chemical Engineering
210 Ross Hall, Auburn University, AL 36849
Ph: (334)844-2036 Fax: (334)844-2063
croberts@eng.auburn.edu, www.eng.auburn.edu/users/croberts/

Virginia,

This is great news! Congratulations.

This will also actually help with the minor as I was receiving some negative feedback for having a 5970 course included.

Chris, Please respond with your support as soon as you can so we can submit the minor for approval.

Thanks for your help.

Rob

5970 was special topics. Since the tirobology minor was initiated the course became an “official” course. The new number is CHEN 5660
From: Robert Jackson  
Sent: Wednesday, February 01, 2012 10:46 AM  
To: Christopher Roberts  
Cc: Virginia Davis  
Subject: Tribology Minor

Dear Chris,

We are about to submit the minor to the University Curriculum Committee. Could you please submit a statement stating that Chemical Engineering supports the enrollment of tribology minor students in Virginia Davis’ course (CHEN 5970 HR: 3 Macro. Assembly & Appl. of Nanomat.) if they have the required prerequisites? This statement can just be an email back to me. Attached is also a copy of the tribology minor approval form. We hope that the minor can be started in Fall, 2012. At first we do not expect many students (<6), until we have more support for more scholarships and faculty resources if needed. In the future, we might be able to help you offer this and other CHEN courses that fit into the Trib. Minor more often.

Thanks for your support!

Thanks,
Rob

Associate Professor
Department of Mechanical Engineering
1418 Wiggins Hall
Auburn University, AL 36849

Office #:334-844-3340
Cell #: 334-663-5999
Fax #: 334-844-3307
robert.jackson@eng.auburn.edu
www.eng.auburn.edu/~jacksr7/
Dear Rob,
My Department does support the enrollment of tribology minor students in organic chemistry courses provided they have the required prerequisites. I wish you success in this exciting educational venture.

Vince

J. V. Ortiz
Ruth W. Molette Professor and Chairman
Department of Chemistry and Biochemistry
179 Chemistry Building
Auburn University
Auburn, Alabama 36849-5312
334-844-4043
fax: 334-844-6959
ortiz@auburn.edu
www.auburn.edu/cosam/JVOrtiz

-----Original Message-----
From: Robert Jackson
Sent: Wednesday, February 01, 2012 10:41 AM
To: Vincent Ortiz
Subject: RE: Organic Chemistry and Tribology Minor

Dear Vince,

We are about to submit the minor to the University Curriculum Committee. Could you please submit a statement stating that Chemistry supports the enrollment of tribology minor students in the organic chemistry courses if they have the required prerequisites? This statement can just be an email back to me. Attached is also a copy of the tribology minor approval form. We hope that the minor can be started in Fall, 2012. At first we do not except many students (<6), until we have more support for more scholarships and faculty resources if needed.

Thanks for your support!

Thanks,
Rob

-----Original Message-----
From: Vincent Ortiz
Sent: Wednesday, April 07, 2010 9:11 AM
Dear Rob,
This is excellent news. My acquaintances in the field of tribology certainly must know many concepts that are discussed in 2070. I will pass this message on to our Undergraduate Program Officer, Mike McKee, and to all the members of my Department's Organic Division.
Best wishes,
Vince

>>> Robert Jackson 4/6/2010 1:50 PM >>>

Dear Prof. Ortiz,

With encouragement from industry, a group of faculty have developed a plan for an undergraduate minor in Tribology at Auburn. If you do not already know, Tribology is the study of friction, wear and lubrication. Therefore we believe the organic chemistry is a cornerstone of the minor. We plan to add CHEM 2070/2071 to the required courses for the minor. Since this is a currently existing course, I thought this would be acceptable. The only effect that you might have is that a few more students might be taking the course. If you agree, I would like to have your approval for this.

Also, I would like to inform the faculty that teach this course regularly, although they might not notice otherwise. Who usually teaches CHEM 2070/2071?

Thanks for your help.

Best Regards,

Rob Jackson

Associate Professor
Department of Mechanical Engineering
270 Ross Hall
Auburn University, AL 36849-5341

Office #:334-844-3340
Cell #: 334-663-5999
Fax #: 334-844-3307
robert.jackson@eng.auburn.edu
www.eng.auburn.edu/~jacksr7/
The Thomas Walter Center for Technology Management  
Auburn University

Business-Engineering-Technology Program  
*Making a difference since 2000*  
"Launching new products and businesses through teamwork"

A memorandum of agreement with the proposed Tribology and Lubrication Sciences Program (TLSP)

6/16/2011 (version 2)

**Purpose**
The UG TLSP program is an applied program that trains students not only in engineering but also in relevant business practices to make them attractive to lubricant channel vendors/blenders/manufacturers or give them the opportunity to learn to become entrepreneurs in this industry.

**Nature of interface with the BET minor**
TLSP minor would accept BUSI/ENGR 3510: "Introduction to BET" as an elective. The BET program agrees to admit qualified TLSP minors (cumulative GPA >= 3.0) in to the BUSI/ENGR 3510 course offered each fall, if an application is made in January with other BET applicants.

**Limits**
The BET Program initially agrees to admit no more than three TLSP students per year, subject to optional review of the number annually. This ensures that the BUSI/ENGR 3510 class is primarily made of BET students.

**Application to the BET course**
Interested TLSP students will apply in January with all applicants to the BET program in January each year for fall start. If the TLSP student meets BET admission criteria, he/she will be notified in February and will be registered by the TWC office in BUSI/ENGR 3510 offered that fall. The students will indicate in the on-line application that they are TLSP minors. Applicants must be enrolled in the College of Engineering or Business and must have a GPA >= 3.0 and compete with other applicants for seats.

**Pre-requisites**
A letter to the Director of BET from the Coordinator of TLSP.
Option to continue in BET Program
All TLSP minor students enrolled in BUSI/ENGR 3510 course have the option to continue in the BET program if they maintain good standing in the either the COE or COB with a GPA \( \geq 3.0 \).

Contact persons:
BET program: Dr. Paul Swamidass, Director BET, swamidas@auburn.edu
TLSP program: Dr. Robert Jackson, TLSP coordinator, jacksr7@auburn.edu

Signed:

Dr. Robert Jackson 6/20/2011
(Dr. Robert Jackson, Proposed TLSP Program)

Dr. Paul Swamidass 6/20/2011
(Dr. Paul Swamidass, Director, BET Program)
The Tribology & Lubrication Sciences Program (TLSP)
at Auburn University

Robert Jackson
Auburn University

Ralph Beard
Palmer-Holland, Inc.

Objectives:
- To promote education and advancement within the field of Tribology.
- To develop engineering and select business graduates that will improve the understanding of the lubrication industry and ultimately begin careers in tribology.
- Create a viable extension service that supports the science of Tribology and Lubrication Engineers and specialists in the field.

Motivation:
- Few professors at universities are teaching or researching traditional Tribology.
- Graduates receive very little exposure to Tribology via core courses.
- To fill a need from industry for graduates who have a background in Tribology.
- Tribology is an area that often goes unaddressed unless you have an appreciation for it.
- If we educate more people about Lubrication Science & Tribology, many industries may benefit.
- The demand for engineers that have the basics of Tribology will increase as the current workforce retires.

Plan:
TLSP plans to address these issues by improving the opportunities for tribology education at the undergraduate and graduate level. At the undergraduate level several actions are planned:
- Tribology Minor: Multidisciplinary set of courses that will provide a fundamental background in the area.
- Seminar Courses from Industry
- Scholarships

At the graduate level, which will be pursued after the undergraduate program is well established, the TLSP will seek to promote tribology research and scholarships for graduate students working in tribology.

Faculty:
- Robert Jackson, ME
- Lewis Payton, ME
- Bart Prorok, MatE
- Jeff Fergus, MatE
- Bob Ashurst, ChemE
- Virginia Davis, ChemE
- Curtis Shannon, Chemistry
- Maria Auad, Polymer and Fiber
- Sushil Adhikari, Biosystems Eng.
- Paul Swamidass, Thomas Walter Center for Technology Management

*Students without the required prerequisites will require faculty approval.
Undergraduate Minor:

We believe that the first critical item on the agenda of the TLSP is the formation of a Tribology Minor for undergraduate students. The minor will provide engineering students at Auburn with the opportunity to acquire a more in depth knowledge of tribology before entering the work force. The students will be required to complete a set list of core courses as shown below. They will then also have the freedom to choose two or more additional courses which could help them specialize in one or more areas of tribology. The required courses are all officially numbered and offered courses, however, some of the elective courses are ****5970 trial courses that may not always be offered. Additional elective courses may also be added to the minor in the future as they become available.

Total Course Hours: 15

Required Courses*:

<table>
<thead>
<tr>
<th>Number</th>
<th>Title</th>
<th>Hrs</th>
<th>Instructor</th>
<th>Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>PFEN 5910</td>
<td>Rheology</td>
<td>3</td>
<td>Auad</td>
<td>Polymer and Fiber</td>
</tr>
<tr>
<td>CHEM 2080 or CHEM 2030</td>
<td>Organic Chemistry II or Survey of Organic Chemistry</td>
<td>3</td>
<td>Various</td>
<td>Chemistry</td>
</tr>
</tbody>
</table>

* Students are required to take all courses, but cannot count them toward the minor if they are used for their major degree (only free electives can be used). Therefore if a course is already used for a student’s major, then another course from the electives below will be used to reach the required 15 hours.

Elective Courses (add until 15 hours counting toward Minor are reached):

<table>
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<th>Hrs</th>
<th>Instructor</th>
<th>Department</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUSI 3510</td>
<td>Introduction to Business and Engineering</td>
<td>3</td>
<td>Swamidass</td>
<td>Business</td>
<td>Existing</td>
</tr>
<tr>
<td>MATL 5600</td>
<td>Corrosion</td>
<td>3</td>
<td>Fergus</td>
<td>Mat. Eng.</td>
<td>Existing</td>
</tr>
<tr>
<td>MECH 5240</td>
<td>Boundary and Full Film Lubrication</td>
<td>3</td>
<td>Jackson</td>
<td>Mech. Eng.</td>
<td>In Process</td>
</tr>
<tr>
<td>CHEM 5520</td>
<td>Surface Chemistry</td>
<td>3</td>
<td>Shannon</td>
<td>Chemistry</td>
<td>In Process</td>
</tr>
<tr>
<td>CHEN 5970</td>
<td>Macroscale Assembly and Applications of Nanomaterials</td>
<td>3</td>
<td>Davis</td>
<td>Chem. Eng.</td>
<td>Existing</td>
</tr>
<tr>
<td>MECH 5970</td>
<td>Multiscale Contact Mechanics</td>
<td>3</td>
<td>Jackson</td>
<td>Mech. Eng.</td>
<td>Existing</td>
</tr>
<tr>
<td>CHEN 7020*</td>
<td>Interfacial Phenomena</td>
<td>3</td>
<td>Ashurst</td>
<td>Chem. Eng.</td>
<td>Existing*</td>
</tr>
<tr>
<td>MATL 7320*</td>
<td>Thin Film Science and Technology</td>
<td>3</td>
<td>Prorok</td>
<td>Mat. Eng.</td>
<td>Existing*</td>
</tr>
<tr>
<td>MECH 5260**</td>
<td>Automotive Tribology</td>
<td>3</td>
<td>Various</td>
<td>Mech. Eng.</td>
<td>Future</td>
</tr>
<tr>
<td>BSEN TBD**</td>
<td>Biomass and Biolubricants</td>
<td>3</td>
<td>Adhikari</td>
<td>Biosystems</td>
<td>Future</td>
</tr>
<tr>
<td>CHEN TBD**</td>
<td>Lubricant Base Stocks</td>
<td>3</td>
<td>Various</td>
<td>ChemE</td>
<td>Future</td>
</tr>
</tbody>
</table>

*May be adapted to undergraduate courses in the future.

**Possible future topics, but not included in the immediate curriculum
Poll Results

The poll was given to students in the 2010 Fall Semester Introduction to Engineering course (ENGR 1110) that is taken by all engineering students during their first year. A total of 287 students answered the poll (111 Mechanical Students, 62 Chemical Students, 12 Biosystems Students, 29 Industrial and Systems Students and 73 other engineering students). In summary, well over 50% of all polled students expressed interest in the minor, no matter their major. In fact, nearly 77% of all students expressed interest in the minor if a $1000 scholarship is offered. Also note that offering a $1000 scholarship increased the number of Extremely Interested responses by 9.4%.

Are you interested in pursuing a Minor in Tribology?

![Pie chart showing poll results]

- **Possibly Interested**: 63%
- **Not interested**: 30%
- **Extremely interested**: 7%

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**All Polled Engineering Students**

- **Possibly Interested**: 63%
- **Not interested**: 30%
- **Extremely interested**: 7%

---
Are you interested in pursuing a Minor in Tribology?

**机械工程学生**

- 极度感兴趣 9%
- 不感兴趣 21%
- 可能感兴趣 70%

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*图示展示了机械工程学生对于追求数学模型专业的兴趣程度。*
Are you interested in pursuing a Minor in Tribology?

- Extremely Interested: 11%
- Not Interested: 24%
- Possibly Interested: 65%
Are you interested in pursuing a Minor in Tribology?

**Industrial and Systems Engineering Students**

- **Extremely Interested**: 0%
- **Not Interested**: 45%
- **Possibly Interested**: 55%
Are you interested in pursuing a Minor in Tribology?

Biosystems Engineering Students

- Extremely Interested: 0%
- Not Interested: 50%
- Possibly Interested: 50%
Are you interested in pursuing a Minor in Tribology?

Other Engineering Students

- Extremely Interested: 5%
- Possibly Interested: 55%
- Not Interested: 40%
If a $1000 scholarship were available, would you be interested in pursuing a Minor in Tribology?

**All Polled Engineering Students**

- **Not Interested**: 23%
- **Extremely Interested**: 17%
- **Possibly Interested**: 60%
If a $1000 scholarship were available, would you be interested in pursuing a Minor in Tribology?
If a $1000 scholarship were available, would you be interested in pursuing a Minor in Tribology?

**Chemical Engineering Students**

- Not Interested: 23%
- Extremely Interested: 21%
- Possibly Interested: 56%
If a $1000 scholarship were available, would you be interested in pursuing a Minor in Tribology?
If a $1000 scholarship were available, would you be interested in pursuing a Minor in Tribology?
If a $1000 scholarship were available, would you be interested in pursuing a Minor in Tribology?
The following graph also shows the percentages of students leaving contact information in the form of an email address (a total of 138 were obtained).