PLASTICS AND POLYMER ENGINEERING TECHNOLOGY (AAS DEGREE)
PLASTICS ENGINEERING TECHNOLOGY (BS DEGREE) AND RUBBER ENGINEERING TECHNOLOGY (BS DEGREE)

SELF STUDY

FOR

ACADEMIC PROGRAM REVIEW

Ferris State University
College of Technology
Plastics and Rubber Engineering Technology Department

September, 2014

Introduction

The format of this report follows the guidelines set by the university and the Academic Senate in respect to being goal-oriented. The report reflects on the previous goals of the last program review completed in 2008 as well as the goals set by this Academic Review Panel for the 2014 review cycle.

The narrative portions of the report are found in the appropriate sections within this notebook, while some supporting data has been housed within the appendices at the rear of the notebook, being referred to within the narrative.

Based on the information attained and the data collected as a result of this study, the industry as well as this program will remain stable and strong for many years ahead. A current *State of the Plastics Industry* overview is contained within the appendices (Appendix "E"). Review of this set of documents supports the above statement.

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Program Name and History

The Ferris Plastics and Rubber programs are one of the largest and most respected undergraduate programs of its kind in the United States. The AAS plastics program began in 1970 to fulfill the need for skilled technicians within a rapidly expanding plastics industry. Then in 1982, the BS plastics program was created to further the training and opportunities for its graduates and today continues to fill a great need for technically trained and skilled personnel to step into engineering, management and sales positions. Ferris graduates gain immediate status as recognized technical leaders. This innovative program provides students with a background that includes topics such as processing, materials properties, testing and selection, mold and product design, and assembly and fabrication. Classes emphasize hands-on learning, using the same type of equipment that is currently used in industry. A new building was constructed in 1987 to accommodate the rapidly growing enrollment of these programs and to house the growing pieces of equipment and supplies necessary to train these larger class sizes. The plastics building was then expanded in 1998 and re-named the "National Elastomer Center" to include the educational space for the new Rubber degreed programs being initiated. The plastics and rubber industries over the years has shown support for the Ferris programs by sponsoring the construction of the Plastics building and its expansion and also by funding equipment and supplies and providing related job experience by employing our students for summer internships, hosting field trips, and by hiring our graduates.

In 2011 the AAS for Rubber and Plastics were combined to form the Plastics and Polymer Engineering Technology (PPET) degree. This allowed students to explore both plastic and rubber and gain skills relevant to both industries before declaring their major of study for the Bachelor's Degree.

Program Mission

Ferris State University's Mission

Ferris State University prepares students for successful careers, responsible citizenship, and lifelong learning. Through its many partnerships and its career-oriented, broad-based education, Ferris serves our rapidly changing global economy and society.

Ferris State University's Vision Statement

Ferris State University will be: The recognized leader in integrative education, where theory meets practice throughout the curriculum, and where multi-disciplinary skills important in a global economy are developed with the result that Ferris State University will also be:

- The preferred choice for students who seek specialized, innovative, career- and life-enhancing education

- The premier educational partner for government, communities, agencies, businesses, and industries through applied research and joint ventures
- A stimulating, student-centered academic environment that fosters life-long engagement, leadership, citizenship, and continuing intellectual development
- A university that aligns its practices and resources in support of its core values of collaboration, diversity, ethical community, excellence, learning, and opportunity

Adopted March 21, 2008

Ferris State University's Core Values

- **Collaboration:** Ferris contributes to the advancement of society by building partnerships with students, alumni, business and industry, government bodies, accrediting agencies, and the communities the University serves.
- **Diversity:** By providing a campus which is supportive, safe, and welcoming, Ferris embraces a diversity of ideas, beliefs, and cultures.
- **Ethical Community:** Ferris recognizes the inherent dignity of each member of the University community and treats everyone with respect. Our actions are guided by fairness, honesty, and integrity.
- **Excellence:** Committed to innovation and creativity, Ferris strives to produce the highest quality outcomes in all its endeavors.
- **Learning:** Ferris State University values education that is career-oriented, balances theory and practice, develops critical thinking, emphasizes active learning, and fosters responsibility and the desire for the lifelong pursuit of knowledge.
- **Opportunity:** Ferris, with a focus on developing career skills and knowledge, provides opportunities for civic engagement, leadership development, advancement, and success.

Program Mission Statement

It is the mission of the Plastics and Rubber Engineering Technology Department to be a world leader in preparing our students for a technical career with companies that manufacture or design plastic or rubber products, materials, tooling or equipment. We will provide a broad foundation for further educational and professional advancement.

The goals of the program are directly in line with those of the university. We embody the spirit of hands on learning and teaching real-world skills that will benefit the students as well as the industries that we serve. As witnessed by the summary of the data from the surveys, our

graduates are very successful in their careers, demonstrate responsibility as citizens through their commitment to recruitment of new students (and willingness to make presentations to existing classes), and many of them have been or are continuing their education. The curriculum remains broad-based (and future change proposals include widening the student's knowledge base in even more career aspects of the industry) and is structured to produce graduates that fill the changing Plastics Industry primary need of engineering technologists.

Program Goals

The programs offered in PPET, PLTS, RUBR have developed the following goals:

1. Maintain incoming student numbers consistent with the program capacity.
2. Assure a safe, current, (and also technically appropriate new) curriculum that remains in line with the needs of the Plastics Industry today as well as in the future, using the most appropriate methods.
3. Center the educational experience on the mission of Ferris State University.
4. Manage and integrate change into the programs in an efficient and effective way, from curriculum to facilities to expanded degree offerings.
5. Assure ongoing, consistent, and relative faculty development per program/curricula needs.
6. Maintain a high placement percentage rate for graduates of the programs.
7. Maintain and expand our visibility in order to remain a key leader in supplying future Plastics and Rubber Industry Engineering Technologists.

Based on the above goals for the programs, we are meeting our expectations. We provide a student that is well prepared to assume any number of positions relevant to the industries current needs. All of our students find placement at jobs that are considered to be in their field of study. Once again our goals align with those set forth by the university to provide a well-rounded, learner centered student who is prepared for life outside of the university setting.

To maintain our connection to the program stakeholders we engage in annual advisory board meetings to review curriculum against the current needs of the industry. Further developing our tie to industry our students are required to take summer internships, during which time a faculty member is assigned to monitor their job duties. By understanding their expectations on the job we can tailor course work to ensure they are provided with the skills and knowledge necessary to actively contribute to the organization during their internship. A site visit is also incorporated which allows for a faculty member to see the latest technology being utilized in industry as well as poll the students superiors as to the preparedness of our students, and identifying an knowledge gaps that should be addressed through course development.

Curriculum

The current curriculum of the Plastics and Rubber Programs follows the traditional 2+2 Ferris model of 2 years to an AAS Degree and 2 additional years to a BS Degree. By its nature and

structure, the Associates Degree Program follows a more sequential format of course requirements and prerequisites to aid in the building of skills and knowledge for the student.

The AAS Degree which was modified in 2012 to combine Plastics and Rubber into one degree of study follows 3 groupings of fundamental knowledge which is required to attain an entry level direct plastics/rubber manufacturing position: 1-processing, 2-design, and 3-testing and materials. It currently includes technical related courses in electronics, graphics and CAD, fluid power, and machining and tooling practices. In addition, a major elective course allows some freedom in an area of concentration.

The BS Degree coursework follows a broader spectrum of related core coursework in either Plastics or Rubber focus as decided on by the students completing the PPET program. Aside from Plastics and Rubber coursework, further manufacturing and engineering discipline topics are covered. As illustrated by the check sheet (link below), courses in management systems, materials, advanced design, decoration and assembly, and economic issues are taught here.

Both the AAS and the BS Degrees have a mandatory 4 credit hour internship as a requirement. This is typically a 10 week, 40 hour per week summer experience. Each one of the internships has its own focus and direction, separating them by the level of coursework and competency that the student possesses at that time in the program.

Following the included check sheet in this section, a summary of a recently developed curriculum change proposal for the AAS and BS Degrees are also included. The proposal speaks of the direction of change that the program faculty is pursuing to enhance the relevance and currency of the student's education, as well as provide for more graduate opportunities within this vast industry. The student will also have more flexibility within their own schedule and educational path to minimize the time spent on acquiring the degree.

Appendix A – Check Sheets

Assessment of Student Learning

Plastics Program-Level Student learning Outcomes

The student will be able to differentiated between different plastics and elastomeric materials and be able to categorize what processes and products employ each material.

The student will be able to list and discuss a variety of processes and products for producing plastics parts and assemblies

The student will gain an understanding of the technical terminology currently used within the plastics industry.

The student will demonstrate an understanding of polymer based the materials and how they are used to create usable products in today's world.

The student will be able to identify the key components of design, testing, and processing components/tools used within the plastics industry.

The student will demonstrate the major functions of the lab equipment used to demonstrate the activities relative to creating a usable product from polymer based materials.

The student will be able to compare the processing nature of thermoplastic, thermoset, and elastomeric polymer materials relative to molecular structure, reaction to heat, and product solidification.

The student will identify and properly name the typical processing defects, identify what typically causes them, and discuss how to generally correct them.

The student will identify commonly used auxiliary equipment of the plastics industry and demonstrate how to basically operate it.

The student will be able to list and discuss the critical machine parts and controls of plastics processing equipment using proper terminology, and demonstrate how they contribute to the running and optimizing of the processes.

The student will identify and discuss the general tooling requirements of the key process and any related processing equipment required.

The student will experience the different design methodologies currently used in the plastics industry by means of demonstrations.

The Student will be able to classify Polymer/Plastic materials and additives by nomenclature (trade name/polymer name/abbreviation)

The student will be able to list and report on which companies produce polymer/plastic materials

The student will be able to categorize polymer/plastic materials using a variety of affinity diagrams

The student will demonstrate print reading skills and be able to list a variety of plastics tooling concepts and nomenclature.

The student will create a number of unique mold and part designs that use solid modeling as it applies to plastic part and mold design, and its use in plastic flow simulations

The student will evaluate and compare several plastics product development strategies that involve new product design as well as product cost reduction and quality improvement.

Conduct various selected tests according to ASTM/ISO procedures.

Utilize statistical tools to monitor part quality in a manufacturing environment.

Identify the various families of materials and describe and classify them in terms of their physical properties.

The student will be able to document the key manufacturing, project management, and quality systems/methods activities on a properly created Work Breakdown Structure and software timeline for a given plastics product.

The student will successfully create typical industry advanced product quality documents following a standardized model for the given plastics product in a team environment.

The student will recognize and document the requirements for a plastics manufacturing company to be classified as a world class operation and identify current quality philosophies and practices which lead to that classification.

The student will describe and demonstrate the use of current continuous improvement methodologies that focus around Lean Manufacturing and Six Sigma philosophies.

To evaluate plastics product development concepts starting with defining customer / end use requirements, through the design cycle? Guide line and product application.

To create 3D models using parametric solid modeling software.

To optimize plastic product and tool designs using flow simulation software.

Describe and list economic concepts of commodity, engineering and specialty materials
Understand and characterize materials based on relative costs
Know and list Major manufacturers of plastics and their resin supply base including MFG/Trademarks

Discuss polymer morphology and effects on performance
List molecular configurations and effects on polymer performance.
Know and describe molecular weight, and its effect on processing conditions and properties.

Discuss and list Major Props (Adv.) of given polymer materials
List certain mechanical properties of given polymer materials
State the Chem./Enviro. Resistance given polymer materials
List specific applications given polymer materials
Discuss typical Formulations and recipes given polymer materials

Define and identify the primary and secondary function of major additives used in the polymer industry
List the additives and their effect on end product performance
Identify which Polymers the additives is typically used with

The student will demonstrate the safe and efficient start-up, optimization, troubleshooting, and shut-down of a typical industrial injection molding process.

The student will be able to match (and discuss the criteria for) injection molds to the proper injection molding machine.

The student will be able to match (and discuss the criteria for) injection molds to the proper injection molding machine.

The student will demonstrate the application of known rheological principles of plastic melt flow to plastic product processing to carry out problem solving activities relative to eliminating molding defects.

The student will characterize various polymer families in terms of their moisture affinities and their processing and flow characteristics as applied to the injection molding processing. This includes the listing of the specifics of safe handling and processing practices for each.

The student will demonstrate the proper use of process monitoring/controlling hardware and software as applied to the injection molding process and be able to interpret the process monitoring graphs to help solve molding problems.

The student will individually obtain current information on various aspects of the injection molding process and equipment. The student will then produce and deliver a presentation on these findings as well as producing a properly written technical paper.

The student will demonstrate the ability to read and interpret a plastics company financial documents/data which are typical to common accounting and business methods and practices for this industry.

The student will discuss and demonstrate the ability to properly accomplish risk assessment and will properly choose the best option(s) when making capital expenditure decisions relative to purchasing equipment or tooling.

The student will be able to utilize the calculations and data relative to financing equipment and tooling and list the taxation guidelines to assure the company's financial success.

The student will identify and recommend packaging options for plastics and non-plastics products (using plastics packaging) as well as identify the level of opportunities and importance of plastics to the packaging industry today.

The student will write lab reports and communicate an understanding of the major pieces of equipment, preparation techniques, and testing of parts that have been assembled or decorated.

The student will demonstrate an understanding of the decorating and assembly processes used throughout the plastics industry and how they will impact the cost and quality of the final product.

The student will operate equipment and/or evaluate the theory and application of processes such as metalizing, electroplating, design modification, cost-reduction, and in part development.

The student will prepare a resume and cover letter as well as outlining the steps in securing a position within the plastics industry.

The student will be able to list and discuss a variety of financial tools and product for both saving, investing, and retirement

The student will participate and evaluate several role-playing scenarios involving interviews, interpersonal communications, and performance evaluations.

Rubber Program-Level Student Learning Outcomes

The student will be able to explain the content of, operations of, and structure of the Rubber Industry.

The student will list and explain the common terminology used in the Rubber Industry.

The student will compare and contrast the Rubber Industry to the Plastics Industry.

The student will identify common end-use applications for rubber products.

The student will be able to identify and explain the basic processes associated with mixing and molding rubber.

The student will be able to list the type of rubber and the other ingredients used in master batches for rubber product manufacturing.

The student will be able to safely and effectively operate a mixer and a two roll mill.

The student will be able to properly interpret and measure out the ingredients of a rubber recipe and then mix it properly.

The student will be able to properly conduct and interpret an ODR test and properly evaluate the recipe/mix based on the data.

The student will be able to apply results obtained from a Mooney Viscometer and a disc rheometer to the set-up of an injection molding press for a production run.

The student will be able to safely operate a rubber injection molding press.

The student will be able to list common defects found in molded rubber parts such as flash, porosity, scorching, and back-rinding.

The student will be able to start up and operate a profile extrusion line.

The student will be able to safely change out molds in compression and injection molding presses.

The student will be able to safely change extrusion die heads.

The student will be able to list the major processes and equipment used within the rubber industry.

The student will identify the key parts of the major equipment.

The student will properly draw a given product using Autocad or CATIA.

The student will explain and discuss shrinkage and flash which occurs relative to parts based on changes in cavity design.

The student will be able to identify and discuss the typical materials used for and construction process for molds of various rubber molding processes.

The student will demonstrate his/her working knowledge of ASTM/SAE standards most commonly used in the rubber industry.

The student will demonstrate their ability to conduct ASTM/SAE standard test procedures.

The student will demonstrate the ability to operate testing equipment.

The student will be able to apply statistics and SPC methods in their lab reports and conclusions.

The student will have an understanding of material testing standards, particularly the guidelines of ASTM D2000/SAE J200.

The student will have an understanding of Quality Systems such as QS9000 and ISO.

The student will be able to utilize the principles of and practical use of APQP and FMEA.

The student will understand the relationship of tool design to part design.

The student will understand the relationship of processing factors to part performance.

The student will be able to define customer and end-user requirements of the part.

The student will be able to use current industry software for design and performance simulation.

The student will be able to identify and list the composition of and properties of the major polymers used to produce rubber products.

The student will be able to list and discuss basic vulcanizing systems and agents for rubber compounds.

The student will be able to identify the chemical ingredients used in basic rubber compounds and explain their purpose.

The student will compare and contrast compounding ingredients and their effect on rubber properties.

The student will identify the differences between thermoset and thermoplastic elastomers.

The student will be able to list all of the curing control parameters used for vulcanization in molding and other processes.

The student will be able to create appropriate charts for manual and automatic cure controls.

The student will be able to explain the connecting processes as well as constraint management.

The student will be able to explain quick change tooling concepts and applications.

The student will be able to operate continuous mixing of compounds using a twin screw extruder.

The student will prepare a resume and cover letter as well as outlining the steps in securing a position within the rubber industry.

The student will be able to list and discuss a variety of financial tools and products for both saving and investing as well as retirement.

The student will participate in and be able to evaluate several role-playing scenarios involving interviews, interpersonal communications, and performance evaluations.

Assessment Measures

Written classroom examinations, laboratory performance examinations, assignment completions and on the job performance and internship evaluations.

There are currently no program policies and procedures in place to formalize the process of updating and monitoring these program-level of student outcomes other than voluntary participation of faculty in using the TracDat software outcomes management system. During the past 3 years its use has been sporadic probably due to inadequate training on how to best use the system.

Collection of Perceptions

Advisory Board - Plastics

Over half of the advisors who responded are alumni of the program which might skew the results a little. Also, there is one detractor who consistently responded with low or negative scores.

In general the advisors thought the programs offered a good balance of "hands-on" education combined with theory in the classroom (Q6c), typically adheres to health and safety standards required by the industry (Q7d) and follow industry standards (Q7f). Additionally, they recognized the need for our graduates by industry (Q7c) and find the faculty student ratio adequate for a sound educational experience.

The advisors also voiced some concern for the programs indicating the programs not reflecting the latest technology (Q7a) and the equipment is in poor or not operational condition (Q7b). In addition, they expressed concern for lack of funding (Q7d), of course this is exasperated by a recent, significant increase in enrollment with no change in budget. Additionally, there was low support for the leadership of the program having a voice in University operations (Q9c).

Additional comments made by the advisors are as follows.

"More management/quality skills training" this is being addressed in a curriculum submission where student will have the option to earn a Quality certificate as part to the BS degree requirements.

"More faculty diversity for the rubber program" this is being addressed in a curriculum submission as well as the addition of Marc Guske to the faculty.

"Program is light on Mathematics and Chemistry", this could be perceived as true, and the program faculty have met and discussed this at length and have concluded that both chemistry and math are applied in program classes in at the BS level.

"Basics of thermal transport are missing and there is too little "Rubber" in the current program". The faculty in spirit agree with this statement, however what should be removed to add a heat transfer course? Also, the rubber content in the Rubber Engineering Technology degree is too little. This is a reflection of curricular modifications to protect the program due to low enrollment. The faculty thought it prudent to get the students into the University in a common AAS and then expose them to Rubber and hope that more would matriculate into the program.

Regarding the function of the advisory board(s) most agreed a common group (combined plastics and rubber professionals) is a good idea. Generally, it is interpreted that there could be more gained from the board by assigning "follow up actions, collaborative projects, with specific assignments" and "action items", also reflected in (Q10c, Q10d). This effort is on-going, the faculty are trying to increase their expectation from the board however it is a slow process.

Conclusion

The advisors to the plastics and rubber programs are most concerned about the funding support and visibility of the programs. Some of the concerns raised by the survey have been addressed, however there is still work to be done in utilization of the board as a resource. Generally, it is thought that a combined advisory board would be more effective than individual boards for Rubber and Plastics.

Advisory Board - Rubber

The mission of the Ferris State University Rubber Advisory Board was to help create a workforce that can be used in the polymer processing industry, where Ferris State is the only program of this kind in the country. The Advisory Board submitted a single document to the Dean and to the Department Chair every year since 2009, with the exception of 2012 in which an Advisory Board Meeting was not held, summarizing and ranking the important points that the industry needed the Rubber Technology Program to incorporate for students who would be ready to fill an internship and assume a full-time career position. The following notes are from documents that were submitted to the Dean and the Department Chair subsequent to those Advisory Board meetings from 2009-2013.

We continue to be concerned about the lack of rubber exposure in the first two years of a student's curriculum. It appears that during the first two years of curriculum, the plastic classes were modified just enough to say that some rubber technology is being covered, but it is important to make it some solid exposure, to rubber starting in year one in order to facilitate their ability to gain meaningful internships starting the summer between their freshman and sophomore years. There is some shared knowledge between rubber and plastics early in the introductory phases, so that some lecture time could be shared, and as an Advisory Board we have previously acknowledged that.

The addition of a half-time or full-time professor to support Professor Yang is critical. The program has significant risk with one Rubber professor, including non-program factors such as health, accident, etc. that could significantly affect the program if something happened to Professor Yang. Students also need some variety in perspective. If there is no variety, and the program cannot support more than one professor, it is pretty hard to convince potential students of the many thoughts and styles that can energize the program, and that this is a program worth attending. In addition to a half-time or full-time Professor, visiting presenters such as business owners or senior level officials at rubber companies could also help to add variety and additional knowledge and viewpoints into the program, possibly through a seminar class. The seminar class would occur once a week and would feature someone different each week.

Student recruiting is critical to the continued existence of the program, and it should be opened up to both the "traditional" and "non-traditional" student. The non-traditional student is of post-graduate age, possibly married, possibly with children, already employed, who cannot live on campus but still wants to improve their capabilities in rubber or possibly change careers to rubber from their current careers. Larry Schult and Bob Speirs have mentioned in the past that "if we can get students into the National Elastomer Center", we have a good chance of enticing them to enter the program. The potential number of "non-traditional" students is probably a number of times greater than the potential number of high school graduates who will come to Big Rapids in a "traditional" degree environment. A "Center of Rubber Technology" could exist at a community college near a major population center in the rubber industry, or possibly at a Vocational/Technical school in a targeted public school district. A true rubber "Champion" needs to be identified within the department to pull the program along.

The equipment in the Rubber Lab is very old and in many cases technologically not up to modern standards. Two companies have been recently critical of interns they have had over the last two years who were not up to speed on their modern machinery, so the Rubber Advisory Board considered a Million Dollar Capital Campaign to modernize Ferris State's rubber lab. The potential Campaign at the Focus on Ferris event held by the rubber industry in March, 2014, from which a visual review of the lab was made to talk about what could stay and what could go. At the newly combined Plastics/Rubber Advisory Board meeting the following month in April, Department Chair Speirs created a single group to look for equipment for both the plastics and rubber labs, and assigned a Plastics/Rubber Advisory Board member to head up the initiative.

With the combination of the Plastics and Rubber programs, it is understandable that Plastics would gain more of the Department's curriculum efforts due solely to the number of students in comparison to Rubber. But a question still remains; is it possible that the Rubber program might better be co-located with another University or Community College, where it could exist as a stand-alone program with the support of the rubber industry behind it to give the rubber students, and the companies who will employ them, their full attention?

Alumni

Disclaimer: Out of about 2000 Plastics and Rubber program alumni, only 943 email addresses were on file. However many of those addresses were alternates for the same individual leaving an estimated 300 distinct alumni attempted contacts. Of those ~300 alumni only 89 responded to this APR alumni survey of which 83 were plastics program alumni or about 4% of the total

alumni. 20 of those alumni are no longer working in the industry however 3 are teaching in plastics.

Also it important to realize that the graduate respondents were distributed from across the years spanning 1973 to present. This is significant in that some issues appearing in the survey, notably in the comments section, have since been addressed after their graduation.

Strong survey response indicators that are consistent with program goals:

62% of the respondents are involved in injection molding with 65% involved with all the other processes. Obviously there is some overlap.

96% of respondents perceive opportunities for career growth as well as lateral movement within the plastics industry

96% felt the plastics programs prepared them well for their first job

95% deemed the internship experience as a valuable component to their educational experience

No one responded as "dissatisfied" with their career choice

All but one individual felt the laboratory experience was necessary with 75% going so far as to rate it as "vital"

Only two individuals rated quality of instruction as "Inadequate"

Strong survey response indicators suggesting action:

With respect to curriculum, over half felt Project Management was lacking from the curriculum, 75% felt Automation was lacking, and about a third also noted Part and Mold Design wasn't enough and 40% felt Composites was not dealt with enough.

Every one of the 89 respondents added a remark in the comments section. A brief summary these re-iterates the need for automation/robotics, more mold and part design, product management, marketing and business courses.

Employer

The respondents tended to be from the Plastics or combined industries with only one company identifying themselves as "rubber". In addition, most of the respondent hire both interns and fulltime employees and many have current employees from the programs. Over 80% of the companies responded a being satisfied with the Ferris employees both from a performance and technical knowledge perspective.

When queried about technical areas of expertise, the companies responded with Polymer processing being very important (Q11a) which is the focus of the FSU education, Design being somewhat important (Q11b) and materials being very important (Q11d). The companies also indicated that Composite (Q11c), decoration and assembly (Q11e), Knowledge of ancillary equipment (Q11f), as "somewhat important". Knowledge of Rubber (Q11g) materials compounding (Q11h) and Elastomers (Q11i) also identified as somewhat important, these skills, of course, are very important to the Rubber industry. The results are not surprising when you review the number of responding companies who consider themselves "Rubber" companies, we

believe if there were a larger representation from the Rubber sector of the industry the result would be identified as "very important".

When asked about the "personal attributes of an employee" (Q13) the companies responded with comments like; "Willingness to work", "team player", "self-starter" (motivated), "problem solver", "detailed" and "accountability", "confidence in technical knowledge", "drive", and "trustworthy". On what "technical skills are important" (Q14) the companies responded with expected comments about "process skills, materials design knowledge and tooling knowledge". Additionally the companies desire; "problem solving skills", "program management knowledge", "metrology", "writing", and "general trouble shooting" skills. Most of these skills are covered in the degree programs, the faculty will review these identified skills and assure they are covered adequately during our students' education.

The company survey also investigated the knowledge expected from interns of our program. The skills expected (identified as important or somewhat important were, communication problem solving, and processing, skills which were not selected in high frequency were design, compounding, and materials testing. Questions 18 (a-h) asked if the companies were satisfied with the skills brought by interns, in general companies seemed to be very satisfied.

Finally, the companies were asked to make additional comments about interns and this is what was volunteered; "great program", "positive experience", "appreciate the partnership", "pleased with the interns", "very satisfied".

Conclusion:
Of course students have unique personal skills and experiences, and we cannot pretend to satisfy all the desire skills of individual companies. The companies who responded to our survey were satisfied with the skills obtained as students in our programs. We seem to be doing a very good job preparing the interns and graduates for the work place.

The program faculty need to investigate how well problem solving skills, program management knowledge, metrology, writing, and general trouble shooting skills are covered in the degree and strengthen those areas identified as lacking.

Current Student Plastic

Strong survey response indicators that are consistent with program goals:

- Current student perceptions relative to curriculum matching industry needs using appropriate methods:
    - Lab structured to reinforce course principles:
        - Processing – 96.2% (highly related or most principles)
        - Design – 91.3% (same)
        - Testing – 83.3% (same)
        - Decoration & Assembly – 87.5 (same)
    - Satisfied with education, meets expectations- 96.3% ("very" and "somewhat"), 70.4% ("very")
- As a program model, the following student perceptions relate to the current program setup:

    - Necessary lab experience to skills development
        - 100% indispensable , augments learning
    - Course material consistent one to another
        - 96.2% indicated consistency felt
    - Courses related to each other
        - 100% felt courses were related
    - Student to teacher ratio
        - 53.8% - optimal
        - 42.3% - too many students
    - State of laboratory equipment to industry
        - Testing
            - 52.2% - equipment representative
        - Tooling
            - 56.5% - equipment representative
        - Design
            - 83.3% - equipment representative
        - Processing
            - 81.8% - equipment representative
        - Decoration and Assembly
            - 59.1% - equipment representative
        - Lab equipment well maintained
            - 94.9% agree
- In relation to faculty development for effectiveness:
    - Instructor qualification to teach course
        - 100% agree
    - Course content consistent with what I need to learn
        - 96.7%
    - Course in line with my needs / interests
        - 96.7%
- In relation to recruiting and retention:
    - Program represents a good value for the money
        - 100% agree
    - Made right choice selecting Plastics Program
        - 100% agree
    - Comfortable recommending Plastics Program
        - 100% agree

Strong survey response indicators suggesting action:

- As a program model, the following student perception relate to the current program setup:
    - Courses structured to develop skills for a job
        - 33.3% - High level, mastered skills
        - 66.7% - Relevant skills, not mastered
    - State of laboratory equipment
        - Processing
            - 11.5% state of art , 69.2% current
        - Decoration and Assembly
            - 4.5% state of art, 54.5% current

        - Project Management Software
            - 9.5% state of art, 76.2% current
    - In relation to program visibility
        - Knowledge of placement / salary data
            - 82.1% students, 64.3% parents

Strong survey additional comments suggesting action:

- High mention of campus visit & tour of facility in "why coming to FSU Plastics Program"
- High mention of faculty input & recruiting in "why coming to FSU Plastics Program"
- Perception of great placement opportunities and job titles after degree
- 96.3% believe that internships were valuable to their educational experience
- 28.6% of respondents transferred from another curriculum or school

Current Student Plastic

Feedback from current students (**Student Interaction from both Plastics and Rubber Majors** : Notes by Jason Holbrook and fleshed out by Jim Manore during the Joint Advisory meeting in April, 2014.)

1. Several students were attracted to the program because it provided a combination of hands on and technical work. Several like lab work and enjoy delving into different types of materials.
2. Some came to the program because a parent or someone else they know is in the industry, a couple were transfers from other schools, came from another Ferris program, and at least one was a chemistry program crossover.
3. Students were also attracted by the chance of obtaining a good salary. The possibility of a good well-paying job was a definite attraction for entering the program.
    a. There was a question from students concerning whether larger classes would soften up the job market for them. Advisory board members assured them that there was a real shortage of qualified technical workers in the industry, and that there would be jobs for new graduates.
4. Some students were happy working with rubber and were talking up the program with other students. They said they were pulling in students from other Ferris programs.
5. Students complained that they did not think the University properly promoted the PPET program. They said they had a rather poor booth at the IRE (Cleveland) because the booth displays were very old and no money was available to make new booth displays. They said they made some of their own booth displays on their own time for this event.
6. A number of the students said they liked the dual program because it allowed them to see a little what both programs were about and gave them a chance to either switch to the other program or be dual majors. This came from both rubber and plastic majors. A couple said they are now participating in the rubber program, just because they liked the idea of compounding.
7. However, there was also the complaint from the rubber students that the plastics students did not get much of a chance to see what the rubber students did unless they took PPET 280. It was their opinion that all students in the combined program should take PPET 280 just so they could see what the rubber world was really like. They thought more

students might switch or become double majors if they had more rubber program exposure.

8. Some of the rubber students said they were volunteering in PPET 280 to make sure there were other students around – for safety reasons. Because a lot of this class support is now voluntary, they thought the program would have a hard time running a large number of students through PPET 280.
9. Some students, especially those that really liked chemistry, thought that the Chemistry 211 with polymer emphasis was not really enough chemistry to understand polymer chemistry very well.
10. Some rubber students were doing a lot of lab testing work for compounding classes on their own time. They thought that there should be a combined compounding/testing class earlier in the curriculum than Rubber 321. The class could be a 6 credit class instead of taking 2 separate 4 credit classes for compounding and testing.
11. Students liked the idea of having outside lecturers coming in to give them other insights that were not available from regular instruction staff. There was discussion that the advisory board could get students in contact with processors and suppliers to aid in helping find speakers, or the advisory board members could find some speakers themselves. Some of these companies might want to get their name in front of students (for hiring purposes), and could therefore be happy to be outside lecturers.
12. Some of the younger students expressed a need to attend a finance class or business class so they could understand how companies are run. Some students said this is taught as part of a class taught by Professor Speirs (499). Advisory board members mentioned that a lot of business training is provided by the companies that hire the students.
13. One student questioned whether DOE was important and whether there should be a class on it. Jay Cline and Ricardo Ramirez mentioned that companies often provide this training, and that only brief exposure was probably necessary while at Ferris. DOE subject matter included as part of a plastic processing course might be sufficient until students were trained in DOE after starting employment.
14. Students complained that the third person working on a machine during labs does not learn much because they are standing too far away from the action. Some students expressed the opinion that they do not think the present lab machine setup can handle 70 students.
15. Students do not like that machines break down when they need to use them.
16. Ricardo Ramirez mentioned that companies are looking for students that also have social skills and are well rounded so they can work with other people. Networking is important for students, in such outside activities as trade organizations, volunteering for various organizations, etc.
17. Students asked where they could get additional information about industry and to get up-to-date information on technology. Suggestions by advisory board members included technical and trade magazines, email blogs, etc. Advisory board members volunteered to provide contacts to the Program so students would have access to sources.
18. There was a question about whether it was necessary to get a Master's degree to obtain a good job. The advice from the advisory board said that the answer to that depended what you wanted to do. The consensus was, that for most jobs in the industry, obtaining a Master's degree was not very important and could actually hurt you if it was deemed you were over-qualified.

Faculty

Disclaimer: It must be pointed out that this faculty survey was administered anonymously and that presents a few possible scenarios for erroneous conclusions to be drawn. In some areas where multiple individuals answered a particular survey question with a response rating equipment, materials, maintenance, etc., when the reality is only a single individual has ever actually taught in that area then the aggregate response may actually be misleading. For instance an individual who actually teaches the relevant course happens to provide a "lacking" response, his response can be drowned out by several others who've never taught the course claiming "adequate" or "marginal", thus the aggregate response does not appear to be a strong indicator of need or issues when in actuality this might not be the case. Thus these types of "hidden" strong indicators have been muted.

Strong survey response indicators consistent with program goals:

- Current class density is considered optimal for learning.
- The "hands-on" nature of the lab section of a course is viewed as a necessary feature of the course work and required to obtain skills needed by industry.
- The internship experience is highly supported and the need for two internships, one for each degree, is deemed necessary to the educational goals and the employability of the graduate.

Important survey response indicators suggesting action:

- Laboratory class sizes are viewed as too crowded for proper instruction.
- Only a single individual feels confident in teaching the blow molding and thermoforming processes, which may reflect upon skills desired for the next faculty search.
- Only a single individual feels confident in teaching tooling, material selection, assembly/decorating/finishing, composites, program management, automation, which may reflect upon skills desired for the next faculty search or suggest direction of next curriculum revision to take.
- There is no one within the faculty that capable of teaching cost estimating, medical devices.

All of the surveys and raw data are available in Appendix B, click the link below to jump to the raw data.

Link to Appendix B

Program Profile

Link to Appendix C – Program Profile Data

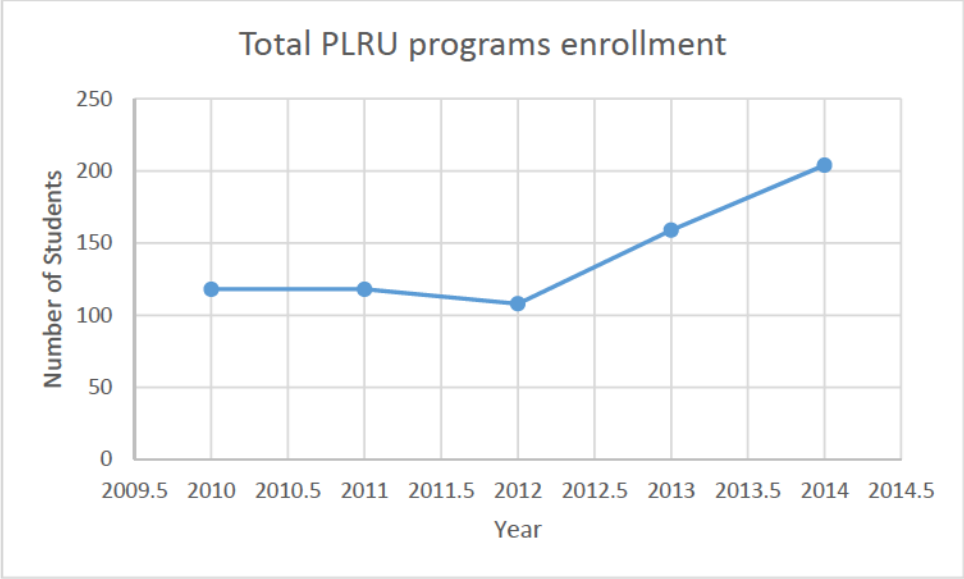
FALL ENROLLMENT BY PROGRAM

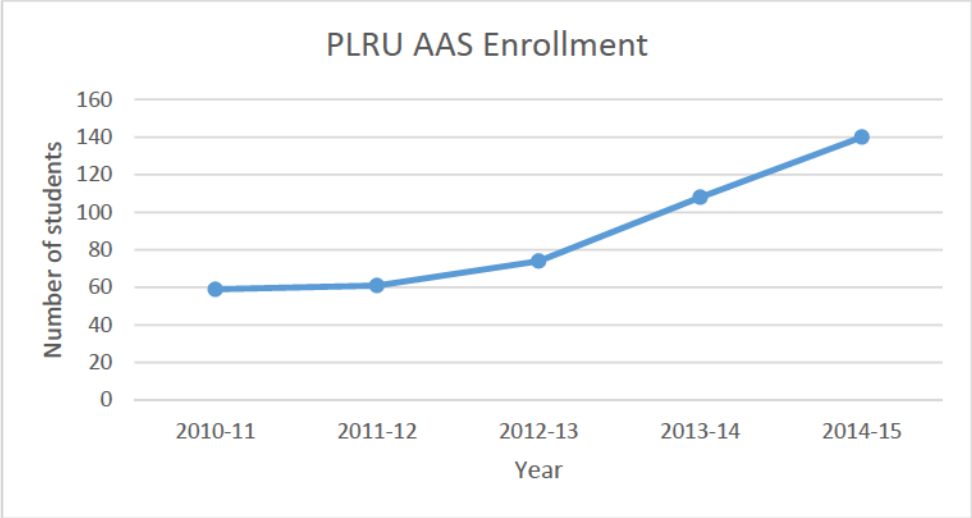
ENGINEERING TECHNOLOGY	2010/11			2011/12			2012/13			2013/14		
	ON	OFF	OL	ON	OFF	OL	ON	OFF	OL	ON	OFF	OL
PLASTICS & RUBBER												
Plastics Engineering Technology BS	43			47			33			43		
Plastics Technology AAS	49			52			70			4		
Plastics/Polymer Eng Tech AAS										93		
Pre-Plastics Engineering Technology BS	7			4			5			2		
Pre-Plastics Engineering Technology AAS	3			2			1			0		
Pre-Plastics Polymer Enginnering Tech. AAS										8		
Pre-Rubber Engineering Technology BS	3			2			2			1		
Pre-Rubber Technology AAS	2			1			1			2		
Rubber Engineering Technology BS	6			4			4			6		
Rubber Technology AAS	5			6			2			1		
PROGRAM LOCATION TOTAL	**118**	**0**	**0**	**118**	**0**	**0**	**118**	**0**	**0**	**160**	**0**	**0**
DEPARTMENT TOTAL	**118**			**118**			**118**			**160**		

PLASTICS/RUBBER ENROLLMENT TRENDS

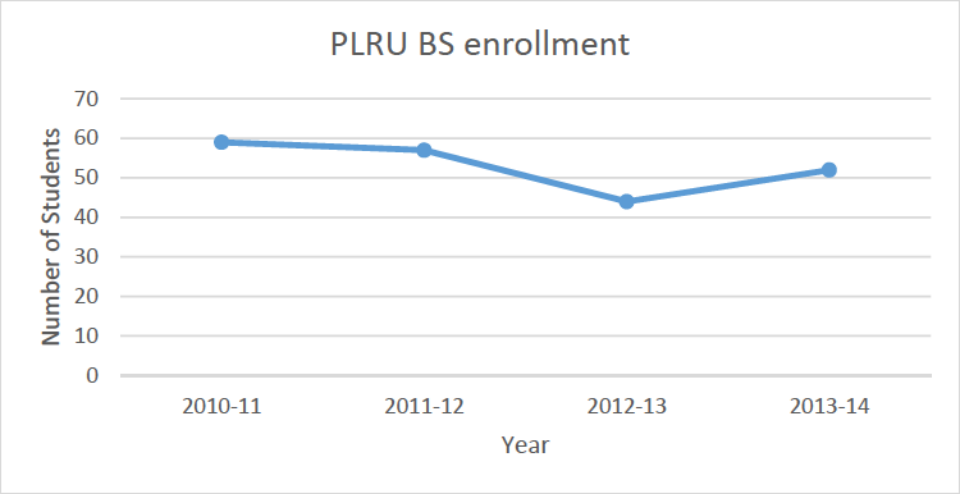
The PLRU department enrollment was at an all-time low in 2010 reflecting the economic down turn in the industrial sector of the United States. That year the department started 22 freshman (See AAS enrollment chart). In subsequent years the department has experienced steadily increasing numbers as seen the graph below. Last year (2013/14) over 70 freshman started in the department and most have been able to continue into the second year. This year, due to limited faculty and budget, the department cut off enrollment in early March in order to manage the number of students in the department.

The challenge is to accept enough first year students to fill both the Plastics Engineering Technology (36) and Rubber engineering Technology (24) degree programs and still be capable of instruction for all the underclassmen.



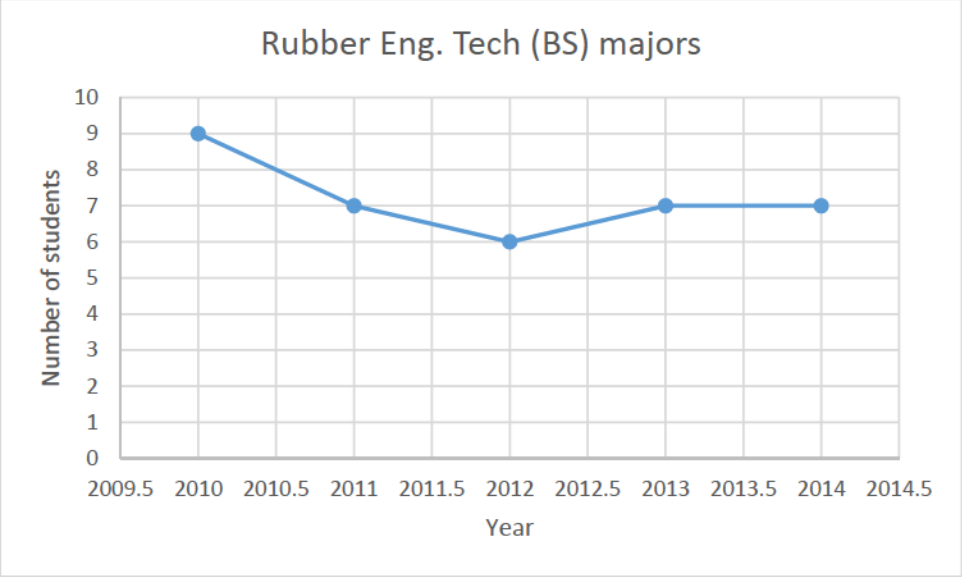


The Bachelor enrollment in the PLRU department has remain relatively stable over the past couple of years with a dip occurring in 2012 reflect the low enrollment years of 2009-2011. This enrollment is expected to increase reflecting the recent AAS enrollment increase.



The department is still challenged with low interest in the Rubber area. As seen in the following graph we have had a difficult time attracting students. The department has become very creative with scheduling to maintain an acceptable level of productivity, BS "rubber" courses are scheduled every other year registering both juniors in seniors in courses.

The current proposed changes to the curriculum at the AAS level we expect to increase the enrollment significantly.



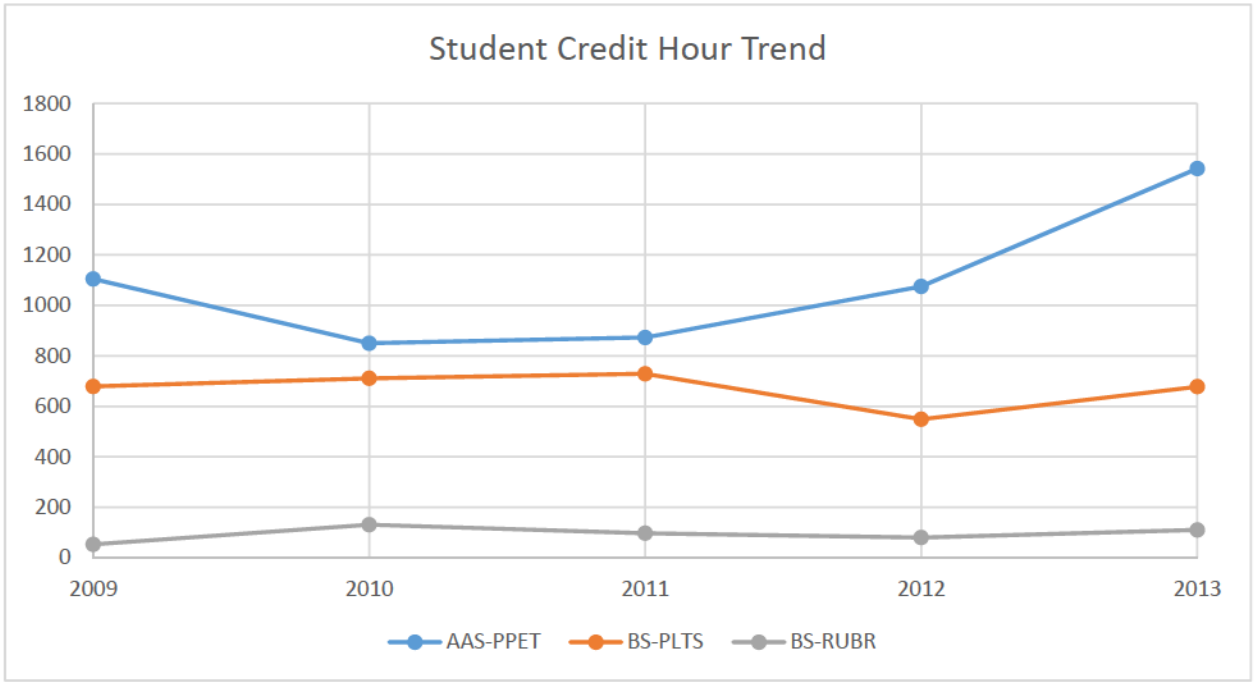
FERRIS STATE UNIVERSITY

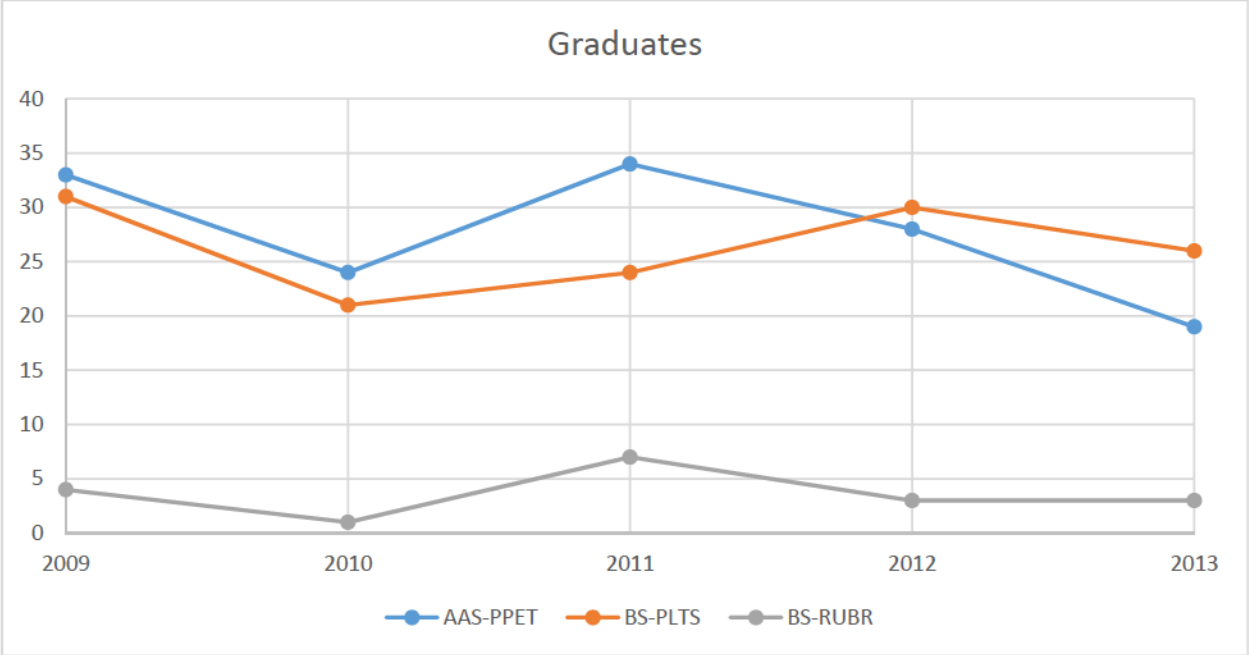
Student Credit Hours (SCH), Full Time Equated Faculty (FTEF) and SCH/FTEF
Aggregated by University by Department within College

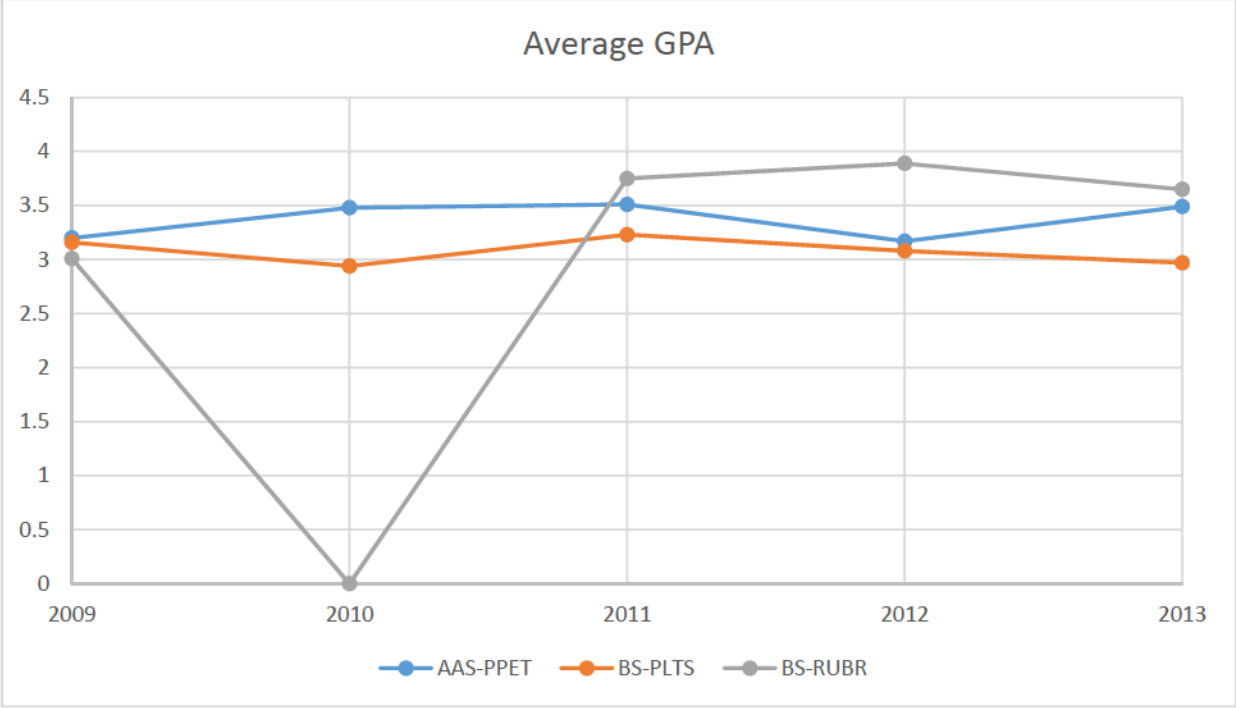
		Student Credit Hours				Full Time Equated Faculty				SCH/FTEF			
Department	Year	Summer	Fall	Spring	F + SP (a)	Summer	Fall	Spring	Avg F + SP (b)	Summer	Fall	Spring	F + SP (a/b)
Coll of Engineering Technology													
Arch Tech-Facility Mgmt	2012-13	136.00	1,317.00	1,207.00	2,524.00	.53	6.10	6.97	7.54	256.60	182.59	173.17	334.97
Automotive	2012-13	185.00	2,090.00	1,850.00	3,940.00	1.44	10.94	11.90	11.42	128.92	191.04	155.46	345.01
Construction Tech-Mgmt	2012-13		1,785.00	1,654.00	3,439.00		9.80	9.27	9.54		182.14	178.43	360.67
EET-CNS	2012-13	64.00	1,138.00	1,181.00	2,319.00	.59	6.60	7.04	6.82	108.47	172.46	167.76	340.06
Energy Systems	2012-13		52.00	40.00	92.00		.33	.33	.33		157.58	121.21	278.79
HVACR	2012-13	392.00	1,698.00	1,760.00	3,458.00	2.45	9.37	10.06	9.72	160.00	181.22	174.95	355.94
Heavy Equipment	2012-13	260.00	957.00	812.00	1,769.00	2.16	4.15	3.88	4.02	120.65	230.60	209.28	440.60
Manufacturing Eng Tech	2012-13	212.00	2,417.00	1,958.00	4,375.00	1.76	9.60	11.54	10.57	120.45	251.86	169.67	413.97
Mechanical Design	2012-13	52.00	2,178.00	1,873.00	4,051.00	.40	9.42	6.89	8.16	130.00	231.21	271.84	496.75
Plastics-Rubber	2012-13	188.00	738.00	1,026.00	1,764.00	2.90	4.50	5.57	5.04	64.83	163.86	184.20	350.21
Printing-Imaging Tech Mgmt	2012-13	156.00	216.00			.76	.75			205.26	288.00		
Surveying	2012-13	54.00	509.00	608.00	1,117.00	.52	3.83	4.08	3.96	103.85	132.78	149.02	282.31
Welding Eng Tech	2012-13	318.00	1,512.00	1,184.00	2,696.00	2.09	6.31	5.62	5.97	152.15	239.49	210.68	451.84

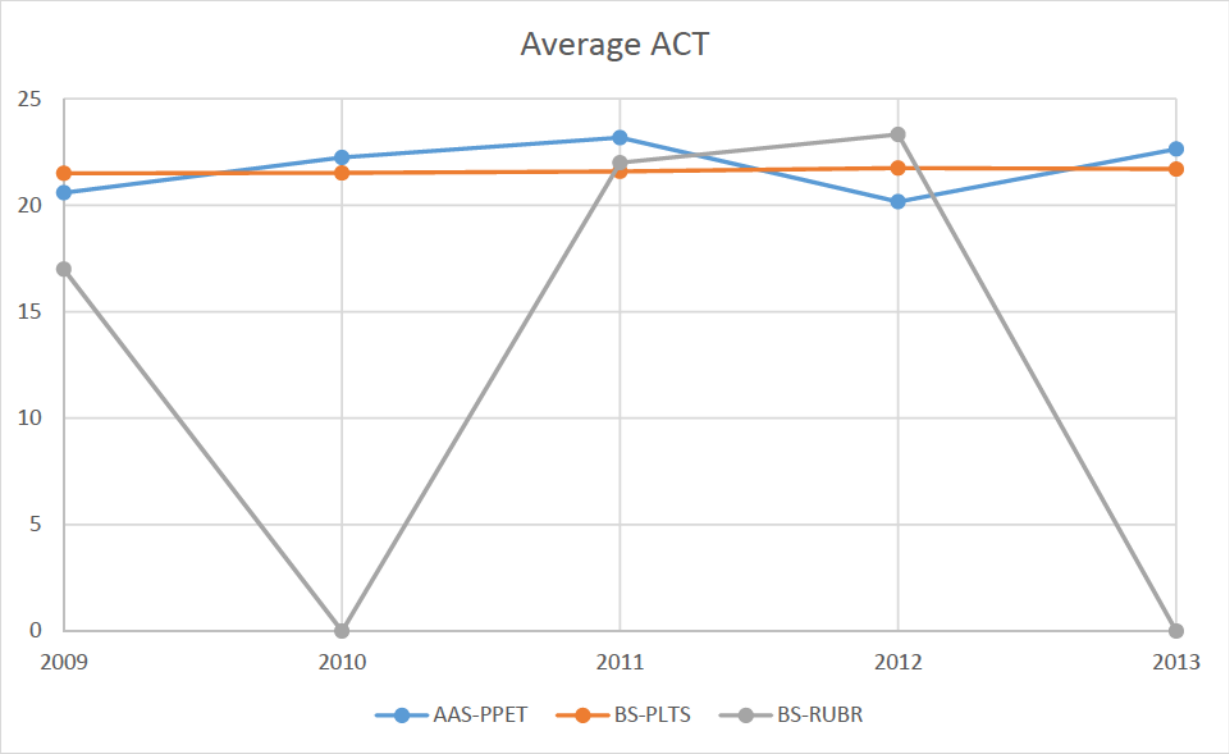
Retention and Graduation of Students

Generally, in terms of department performance, the Plastics and Rubber department graduates a higher percent of its students then either the college or the University. Also, when "persister" performance is reviewed the Plastics and Rubber department keeps more of its enrolled students on campus. This is an indication of a committed faculty and students who understand the value of the specific education they are receiving. See Appendix C for raw data.




Graduates
40
35
30
25
20
15
10
5
0
2009
2010
2011
2012
2013
AAS-PPET
BS-PLTS
BS-RUBR


Average GPA
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
2009
2010
2011
2012
2013
AAS-PPET
BS-PLTS
BS-RUBR



Age, Residency, Gender, Ethnicity

AAS-PPET					
	2009	2010	2011	2012	2013
Average Age	19.5	19.75	20.4	21.2	20
# of Residents	72	56	59	70	100
# of Non-residents	3	3	2	4	6
% Residents	96%	95%	97%	95%	94%
% Non-residents	4%	5%	3%	5%	6%
# of Male Students	70	56	54	66	96
# of Female Students	5	3	7	8	12
% Male Students	93%	95%	89%	89%	89%
% Female Students	7%	5%	11%	11%	11%
# of White Students	70	55	57	69	102
# of Minority Students	5	4	4	5	6
% White Students	93%	93%	93%	93%	94%
% Minority Students	7%	7%	7%	7%	6%

BS-PLTS					
	2009	2010	2011	2012	2013
Average Age	23.5	23.5	23	23	21
# of Residents	42	48	48	38	45
# of Non-residents	2	2	2	0	0
% Residents	95%	96%	96%	100%	100%
% Non-residents	5%	4%	4%	0%	0%
# of Male Students	42	47	47	35	44
# of Female Students	2	3	4	3	1
% Male Students	95%	94%	92%	92%	98%
% Female Students	5%	6%	8%	8%	2%
# of White Students	44	50	50	36	44
# of Minority Students	0	0	1	2	1
% White Students	100%	100%	98%	95%	98%
% Minority Students	0%	0%	2%	5%	2%

BS-RUBR					
	2009	2010	2011	2012	2013
Average Age	25.5	21.5	22.5	22.5	24
# of Residents	5	8	5	4	4
# of Non-residents	0	1	1	2	3
% Residents	100%	89%	83%	67%	57%
% Non-residents	0%	11%	17%	33%	43%
# of Male Students	5	9	6	6	7
# of Female Students	0	0	0	0	0
% Male Students	100%	100%	100%	100%	100%
% Female Students	0%	0%	0%	0%	0%
# of White Students	2	8	5	4	5
# of Minority Students	3	1	1	2	2
% White Students	40%	89%	83%	67%	71%
% Minority Students	60%	11%	17%	33%	29%

Link to Appendix C – Program Profile Data

*Numbers made available from Institutional Research

**BS Pre-program numbers added to respective program

***PPET did not come into existence till 2011 numbers prior to 2011are reflective of the combined previous rubber and plastics AAS and pre-plastics and pre-rubber program enrollments

****GPA averaged for PPET (AAS-PLTS & AAS-RUBR respective enrollment not factored)

Program Value beyond Productivity and Enrollment Numbers

Students choose the Plastics and Polymer Engineering Technology (PPET), the Plastics Engineering Technology (PLTS) and the Rubber Engineering Technology (RUBR) Programs today due to the high ongoing number of placement opportunities and the high wage return for their education.

From the student's perspective, the ongoing placement rate remains at 100% as reported from graduate follow-up studies. The vast majority of the AAS student matriculate into the one of the department's BS degrees. A brief poll of the faculty resulted in no one being able to recall an AAS graduate who exited campus in recent years. In the 2012/2013 year a survey of our graduates indicated a $58k per year average salary, in addition to bonus and commissions. These most recent graduates were placed predominately in Michigan and surrounding States. The distribution is as follows:

Michigan	13
Indiana	2
Wisconsin	1
North Carolina	1
Nevada	1

One asset of the program that substantiates the issue of value is one that follows FSU's philosophy of hands-on education. Like other successful programs, our graduating students are able to be productive from virtually the first day of their employment.

Program Flexibility and Access

As of this moment there are currently no offerings of PPET, PLTS, or RUBR coursework outside of the Ferris State Big Rapids Campus. Faculty have engaged in discussions regarding online offerings, some courses have begun to shift towards mixed delivery to ease the amount of time students have to commit to being in the National Elastomer Center. It is the consensus of the faculty that courses requiring extensive lab work must remain on campus in a traditional classroom setting. Some courses are available in the evenings to accommodate students with nontraditional schedules. However these offerings are limited. As our students are required to complete internships over the summers it is difficult to provide courses to them, as the ability for online instruction is limited by the lab intensive nature of the programs curriculum.

Currently students enter the program in the following ways; incoming freshman, on campus AAS transfers, on campus transfers, community college transfers, and AAS articulated transfers. No matter the entry point into the program, the faculty have structured the course curriculum sequence and required pre-requites in such a manner that students with the appropriate

foundational coursework can complete both the AAS and BS requirements in 2.5 years. Although most will take 3 years to complete.

Program Visibility and Distinctiveness

The execution of plastics education here at Ferris State University has been in existence for the following length of time: AAS Degree – first awarded in 1971 and the BS Degree – added in 1982. As such, the numbers of graduates from these programs who are within the industry have long proclaimed its existence and accolades for its quality. Specific segments of and the companies within those segments of the industry have experienced the successes of our graduates. However, as company management and ownership changes, and as the media focuses on downturns in manufacturing industry and the economy, the degree of our visibility has reduced over the past decade. Having a high number of students who wanted to be in the programs in the 70s, 80s, and 90s, there wasn't a recruiting effort developed since a waiting list existed.

In the mid 1980's the Rubber industry reached out to the university to encourage the development of a degree specific to Rubber Engineering Technology. In 1987 the first freshman class of the Rubber Engineering Technology program began their pursuit of this newly developed degree. We believe this degree to be the only of its kind in the world. The industry support has been strong from the onset and remains to this day. The only drawback is the limited enrollment that the program has seen throughout its history. We are often approached by the rubber industry who express a need for qualified and educated individuals in this field. The opportunity is there it is up to the program to fulfill this need. In an effort to increase enrollment in the Rubber program we have taken the following steps. We have combined the once separate AAS degrees which provides all students with exposure to rubber as well as plastics. This should increase the level of interest in the Rubber BS. We have also hired a new faculty member to supplement the existing knowledge base of the faculty in both Rubber and Plastics. Below are some summary thoughts on the current state of the Rubber Industry. An article in Rubber News is included in Appendix for more detail on the current state of the industry.

- Employment in the rubber industry is at a critical juncture.
- There will be 60,000 openings, not counting tire, hose and belt manufacturers.
- Engineers are among those needed the most and the competition for these candidates is extremely fierce.
- Only Ferris State University and U. Mass, and Akron U. offer specific programs training the engineers to meet the need of the industry.
- To engage youths in the industry, the ACS Rubber Division offer 2-3 scholarships nationally for $5,000 each. Students from the Ferris rubber program have been awarded at least one each year during the past 10 years.

Today, the need for appropriately educated plastics and rubber professionals remains very high. However, the demographic base is shifting the need into other areas of the country/world (and segments of the industry) due to the nature of manufacturing today. As such, we need to increase our visibility in two ways: 1 – stronger and at an earlier time in a student's academic life

within our state and surrounding states, and 2 – across the nation and world within different industry segments that are developing or expanding today.

The Ferris State University Plastics and Rubber Programs remain unique, as there is only a handful of engineering technology based curriculums for plastics and rubber professionals across the nation. On the following page is a listing of current bachelor plastics degree offerings (by institution) across the nation with a notation (*) of those programs similar to the Ferris ones in focus, content, offerings, facilities, and degree. There are also several community colleges with plastics related coursework or degrees (AAS) that feed into our bachelor degree or are possible sources for the feed of future students. We have an established articulation agreement to transition Grand Rapids Community College transfer plastics curriculum students directly into our bachelor degree program.

Plastics related Bachelor of Science Degree programs across the country:

Eastern Michigan University	Chemistry (polymers/coatings) focus
Western Michigan University	Manufacturing focus – plastics option
*Penn State-Erie	Plastics
*Penn State Tech	Modeled off of FSU degree
*Pittsburg State (KS)	Plastics – Design/Process options
U of MA – Lowell	Engineering Based MS & PHD
*Western Washington	Plastics - composites focus
U of WI – Plattville	MFGT Mgmt concentration
*U of WI – Stout	BS Plastics Engineering Tech(New)
CA State – Chico	Manufacturing – plastics option
CA State – Pomona	Manufacturing – limited plastics
Univ. of Akron	Polymer Science – MS/PHD
Univ. of DE	Material Science – polymer focus

Another specific area of uniqueness is the program curriculum. The students receive coursework in every key aspect of the Plastics and Rubber industry, making the degree and knowledge base very well rounded. Through alumni self-reporting it is evident that our graduates attain positions in many different industry segments. As such, they have many plastics and rubber opportunities to focus their career goals on. These materials are used on many things in many ways. The number of different markets of use alone provides a wide range of opportunities.

The nation-wide visibility of the program is currently very limited. As stated previously, the State of Michigan has been the main customer base for our graduates since the degrees began. However, today's manufacturing base is different. In response to this, the program needs to shift efforts to increase visibility on multiple markets in positive growth areas across the nation and on an international basis. Currently, the program holds 2 high school career days per year, one each semester. We are also connected to several other off-campus secondary educational programs as well as having ongoing communications with and presentations to on-campus groups and classes to solicit students. We are quite visible within the State of Michigan (due to location and number of former graduates within the state) but need to address increased visibility both here in Michigan as well as an expanded effort in other states/areas. This is apparent when looking at our split of residents to non-residents. The norm has been to have over 95% of the students enrolled in our programs to be residents of Michigan. The industry is not limited to Michigan, although it remains area for the industry

The ranking of top states for plastics industry concentration are as follows:

#1 - Indiana	19.4 thousand plastics employees per 1,000 non-agricultural employees
#2 - Michigan	17.9 thousand plastics employees per 1,000 non-agricultural employees
#3 - Ohio	16.6 thousand plastics employees per 1,000 non-agricultural employees
#4 - Wisconsin	13.9 thousand plastics employees per 1,000 non-agricultural employees
#5 - Kentucky	13.5 thousand plastics employees per 1,000 non-agricultural employees
#6 - South Carolina	12.6 thousand plastics employees per 1,000 non-agricultural employees
#7 - Illinois	12.0 thousand plastics employees per 1,000 non-agricultural employees

Program Relevance

The extent of employment opportunities for graduates can be realized by looking at an analysis of the Plastics Industry from data and information gathered from governmental agency reports and key professional organizations within the industry. The Society of the Plastics Industry (SPI) is one of those key professional organizations that publish reliable and accurate data about the Plastics Industry. Two governmental agencies used for additional insight into the program's relevance are the U.S. Department of Labor and the U.S. Bureau of Census. Another source to use for evaluation would be the tracking of job offers that come into the program office which directly solicit our graduates.

These sources can be used to highlight current industry trends and to analyze the relevance of continuing plastics education within the university. The key concern for students is the availability of jobs upon graduation and that their education has prepared them for success within that job position. The recent decline in direct manufacturing jobs that the United States has experienced has affected many job classifications within our industrial base across manufactured goods and is not centralized to any one industry. Yet, there are those segments and markets that remain untouched by this downturn. One big factor regarding the extent to which businesses and industries have been affected is their specialization and focus of the manufacturing that they do, and the type of materials they deal with. As a material, plastics continue to be a very dynamic, widely successful, and heavily sought after commodity within the world today. There are very few (if any) areas of life that do not deal with plastics either in a direct or indirect manner.

If one considers the diversity of an industry - the number of different operational segments and the range of career opportunities within it - the Plastics Industry ranks among the highest in diversity both nationally and internationally. (See appendix A) As an example, within the 2002 national census, the Plastics Industry Product and Manufacturing section data is divided into 13 different product codes, which includes the "All Other Plastics Product Manufacturing" code. The "All Other" code contains 9 major goods manufacturing categories itself. The Plastics Technology and Plastics Engineering Technology Programs prepare the student for a successful career which may take him or her into any number of these areas of employment. This is due to the teaching of plastics material, design, testing, processing, and managerial *fundamentals* that cross many Plastics Industry segmental lines.

Program Value

In response to salary for 2013 graduates, the average annual salary for plastics 4 year engineering technology degree (B.S.) respondents was $58,000 + Bonus. In comparison to other programs within the College of Technology, that number ranks towards the top.

One asset of the program that substantiates the issue of value is one that follows FSU's philosophy of hands-on education. Like other successful programs, our graduating students are able to be productive from virtually the first day of their employment.

Faculty Composition and Engagement

COMPOSITION AND QUALITY OF FACULTY

There are currently five Plastics and Rubber Program faculty members and, of them, one is serving as the department chair. The faculty currently has one full time Adjunct employed. Each faculty member's Curriculum Vitae is included within this section. Several key issues regarding the quality of the faculty are addressed when reviewing the vitae:

1. Their own educational background.
2. Their individual experience within the industry they are teaching.
3. Current and ongoing activities relative to teaching.
4. Activities relevant to the development and improvement of the student's education.
5. Activity within professional organizations within the industry.
6. Ferris rank held on the teaching level.

A couple of summarizing statements regarding the faculty along the lines of these points:

- Each faculty member has worked full time within the Plastics Industry at some point in time.
- Each faculty member has worked (at some capacity) with companies within the industry as a consultant, during a sabbatical leave, or as a resource to enhance particular coursework.
- Each faculty member belongs to a professional society for the industry.
- Most faculty members have published information regarding his expertise in various forms – books, trade journals, periodicals, and web sites.
- Most faculty members have followed the promotion sequence and have been upgraded. There are 2 full professors out of the 5 at this time.
- There are 2 faculty members who graduated from competing plastics programs across the nation, two have graduated out of this Ferris program, and one out of a formal education venue.

In addition to the above points, the plastics faculty members are involved in many university, college, and department committees on an ongoing basis. Each one has also been responsible for bringing in both equipment and supplies to the program for student learning on several different levels. This includes hand tools and equipment, material, molding machines, secondary machines, software, etc.

QUALITY OF INSTRUCTION

The best way to assess the quality of the education is to look at the success or failure of the student when implementing the knowledge gained. There are two points of reference/measurement for the assessment of the student in his/her ability to implement correct, current, and relevant knowledge. These two points of reference are the two required internships (one for each program, AAS Degree and BS Degree) that each student is required to take. This is typically done during the summer months between the freshman and sophomore and the junior and senior years.

The students are responsible to find their own internship for that summer. However, many companies start the solicitation process as soon as January of that year. Many companies contact the department directly, or work through the job fairs the university has each semester. The number of repeat companies who take interns from the program is demonstrated by listing each one. Each internship site within Michigan and near states is visited by one of the faculty who is assigned as that student's internship coordinator. The visit produces many favorable results, including a sense of the effectiveness and quality of the instruction being given to the student.

In serving as a wide-based enhancement to the advisory board input regarding curriculum and skill base, the internship visits allow coordinators (which rotate from year to year) to get first hand industry input to and assistance with topical content to the courses being taught.

Each intern is also formally evaluated by their supervisor. The evaluation is a requirement for completion of the class (each internship is a 4 credit hour required course). The coordinator reviews the evaluation and is able to address individual student issues or program course/content issues as a result. Most issues stem from the individual person versus the preparation for the internship experience within the Plastics Industry. Final internship reports (another requirement) are kept on file within the student resource room here in the National Elastomer Center.

Link-Curriculum Vitae

Program Administration and Support

Throughout the review process, just a couple of issues arose that need to be addressed in relationship to the effectiveness of how the program is run. First of all, the current curriculum does not contain provisions for the development of and then re-current delivery of new classes for possible inclusion as directed electives or core curriculum coursework. Such existing (3 total) courses that have been taught on a very successful experimental basis end up in competition for students who currently have only one slot to take them in (for program credit).

The department and faculty have initiated a workable plan as to how to handle the relationship between the Plastics and Rubber curriculums/programs. This plan includes combining AAS degrees into one degree which will have both Rubber and Plastics content. With only 1 faculty member and an adjunct who teaches in both AAS programs, the Plastics Program is assisting by teaching rubber courses currently. Stronger efforts need to be made recruiting the AAS students into the Rubber Engineering Technology degree. The enrollment and career path need to be evaluated once the curricular change has been fully realized.

Support Services

The Plastics and Rubber Programs have made a greater effort in recent years to utilize the support services offered by the University. As we have begun to explore mixed delivery and utilization of Blackboard we have relied on the Faculty Center for Teaching and Learning to assist in developing online content and utilizing Blackboard to its fullest potential.

The programs are heavily integrated with the career center. All freshman sign up for the career services website as part of the introductory coursework. Companies seeking grads and interns are directed to the career center to properly post jobs and set up interviews. The faculty encourage students to attend job fairs on campus often with bonus points awarded as an added incentive. Furth the faculty does its best to attend the job fair and speak directly with the employers representing our respective industry. We often allow potential employers to come give presentations in our building to encourage greater student attendance.

The faculty could look into utilizing more of the resources available to improve content delivery, program recognition (marketing), and the overall student experience.

Facilities and Equipment

Link to Appendix E - Facilities

The information contained within this section is made up of data acquired from a survey given to the program faculty. Response frequencies and a summary of the significant responses are given. This section is divided up into several areas. The front of the section contains the actual survey, followed by the responses to the survey. After the responses is found the interpretation and reporting of the findings (sections 4A through 4D). The section is informational in its intent, and final conclusions as a result of the information are left for Section #5 per the report guidelines. To see the raw data and a copy of the survey reference Appendix D

A. Instructional Environment

The National Elastomer Center (NEC) houses the AAS Plastics and Polymer Engineering Technology program as well as both the BS Plastics Engineering Technology and BS Rubber Engineering Technology programs. The entire building went through a multimillion dollar renovation and expansion in 1997.

The four main lecture rooms allow lecturers to utilize a full range of multimedia delivery systems. Additionally, there are four main laboratory prep rooms that can also serve as adjunct lecture rooms as required.

The main open-area laboratories house state-of-the-art manufacturing equipment that allows the student to experience the same technology that is used in the plastics industry. Auxiliary

laboratories, of which there are six, provide an environment for smaller, more specialized equipment.

B. Computer Access and Availability

Computers are available for all students to use through the NEC facilities. The main computer lab houses 17 student work stations that are primarily used for design analyses and project management. These computers are a 2007 level of technology. Current input from the College of Engineering Technology Dean's office is that it is not cost efficient for programs to maintain individual computer labs. At the time of this report, an initiative is underway (but not yet approved) to require program students to provide their own laptop. There is no plan to replace the computers in the NEC computer lab.

Additional computers are available in the NEC processing and auxiliary labs. These computers are also of 2007 vintage and in various states of usefulness. Should a program wide student laptop initiative be implemented, care will have to be taken to examine the licensing issues inherent with placing proprietary software on non-university computers.

C. Other Instructional Technology

The instruction of Plastics Engineering Technology requires a significant amount of capital equipment as well as costly resins. It is through both donations and consignments from companies that have partnered with the program that allows us to avoid purchasing this costly equipment. The consignment arrangements also allow for the consigning company to remove the older equipment after several years and to replace it with newer, more technically relevant equipment. It is this arrangement that keeps the laboratory technically current.

Additional partnerships have been nurtured to allow companies to set up unique equipment, such as a state-of-the-art robotic system. The donating company will use this equipment for their customer's technical training and, when not in use by them, allow students and faculty to utilize these systems.

D. Library Resources

The Plastics Engineering Technology programs have developed a solid working relationship with FLITE (library). This includes providing the latest references and online resources. Our students actively utilize all of the library resourced including the CAD (Computer Aided Design) software at FLITE. Additionally, the NEC has one room dedicated as a student resource room that acts as both a depository for publications and as a student meeting room.

Interpretation of Facilities and Equipment Survey

The assessment tool was developed by Plastics Engineering Technology faculty and taken by the faculty. The results are as follows:

The consensus indicates that the perception of the condition of the classrooms, the availability of equipment, and the support aspect of the building maintenance and equipment is generally favorable. Areas receiving predominately positive ratings (somewhat and very satisfied)

- Building security meets needs (100%)

- Operable condition of equipment (100%)
- Technician availability (100%)
- Technician skills (100%)
- Breakdowns promptly handled (100%)
- System for reporting breakdowns (100%)
- Building cleanliness (100%)
- Janitorial support (100%)
- Restroom maintenance (100%)
- Office copier resources (100%)
- Projection systems (83%)
- Room lighting (83%)
- Equipment available (83%)
- Equipment maintenance (83%)
- Safety systems (83%)
- Material availability (83%)
- Procuring lab equipment (consignment) (80% of valid)
- Equipment up to date (67%)
- Availability of injection molds (67%)

Key Areas of Attention:

Areas receiving significant negative ratings (somewhat and very dissatisfied)

- Building HVAC (83%)
- Procuring lab equipment (purchasing) (75% of valid)
- Lab HVAC (67%)
- Hand tool availability (67%)
- Disposition of unneeded equipment (60% of valid)
- PC / digital systems (building) (50%)
- Availability of non- injection molds (50%)
- Procuring lab equipment (donation) (50% of valid)

A broad group of written comments is included within the survey summary. A few areas of attention that received multiple comments-

- NEC Issues / Concerns
    - HVAC system is inconsistent
    - NEC is 17 years old and starting to show wear and tear
- Lab Equipment Issues / Concerns
    - Insufficient budget for upgrading equipment
    - Lack of current / modern equipment
    - Difficulty finding replacement parts and technical support for obsolete equipment
    - Computers are dated and slow, no money to upgrade
    - Difficulty in obtaining consignments
    - Primary equipment areas identified as needing replacement-
        - Testing laboratories

- PPET 115 lab
- Rubber lab

Perceptions of Overall Quality

PROGRAM RATING, Plastics Engineering Technology – FACULTY OPINION

Composite rating Plastics Engineering Technology……88.5

….this is based on the lack of true tooling design, testing practices and applications, and emphasis on other processes. It is too heavily focused on injection molding

Considering the students are our first customers, then the programs' alumni represent the "finished" product of what our programs have produced over the years. If the plastics industry that hire our students are our secondary customers then they must include our alumni as well. In fact many of these alumni hire our current and past graduates and thus are representatives of the industry. Judging by their positive responses in the alumni survey and the high starting salaries offered for our graduates, one can only conclude that there is high satisfaction with the skill levels of the current graduates. The fact that industry recruiters continue to vie for the limited number of graduates we can produce each year says to me that we apparently are quite successful in preparing our students with the skills they need to start and succeed in their career in the plastics/rubber industries and after all, isn't that the bottom line?

….this is mostly based on the employability of graduates and the value they provide to employers.

…this is based on a generally very successful program which places graduate in high paying good careers with relatively strong futures. However, there are unrealized challenges for the Program, staying current with industry technology (equipment), industry trends and difficulties with enrollment management and budgets.

PROGRAM RATING, Rubber Engineering Technology – FACULTY OPINION

My Perception of Overall Quality: Rating: 70

…this is based on the lack of processing and testing equipment. Enrollment seems to be a nagging problem that prevents any real investment into the rubber program from taking place

… I would generally rate the program as highly as the plastics program (and for the same reasons). The reduced overall rating is due to the program's inability to be self-sustaining due to lack of enrollment.

….the Rubber degree is an extremely viable degree, however it has not proven to sustain enrollment. The faculty and the advisory members have made many efforts to attract students, with limited success. Low enrollment along with outdated machine technology causes the lower rating.

……The overall is 85% since we are the only one offer the training on both rubber and plastics.

Implementation of Findings

Findings suggested from the alumni survey and possible implementation avenues to take:

Apparently there are many things we are doing right within the programs, with the focus on practical experiences and hands-on labs, it's important to not change those aspects. However the suggestions to add new courses or expand on current courses should be taken into serious consideration during the next curriculum revision. Automation/robotics has already been addressed recently as an addition to the curriculum. Though project management is a course currently being offered, it may need to be expanded to include more direct applications involving plastics/rubber engineering projects. Likewise the current mold and part design courses should be examined to see if these offerings could be expanded or added to. Though composites was once part of the curriculum with a full component of hands-on laboratory experiences, it was deemed too expensive to justify the labs and back then seemed like more of a niche category in which our graduates were never employed. However, the results from the survey suggest the case may have changed significantly over the years and it may be necessary to again consider the feasibility of offering an updated composites course.

With the inevitable retirement of faculty in the very near future, it would be a good time to begin to consider what skills to pursue in prospective replacement faculty with an eye to how the curriculum might be modified to incorporate these suggestions.

Findings suggested from the faculty survey and possible implementation avenues to take:

Continue the hands-on assignment-based type laboratory experiences and continue to require two internships (one for each degree level) as these have been valuable (results from the alumni survey also corroborate this). Though the laboratory classes are considered important to the practical education of our students, it is suggested that already lab sizes are too crowded and the trend toward ever increasing this density for the sake of efficiencies may not be wise from the standpoint of sacrificing the learning experience and safety. Perhaps this can be solved by obtaining more lab assistants and more equipment stations to allow a more manageable number of students per machine per lab. A policy needs to be established to determine what is a safe and reasonable lab density that best addresses the issues of opposing goals of quality of learning and efficiencies.

Findings suggested from the current student survey and possible implementation avenues to take:

The results of the current student survey are generally very positive. Arguably most important – 100% of respondents said that they made the right choice in selecting the program, felt the program was a good value for the money, and felt comfortable recommending the program to others. Student responses also indicated satisfaction regarding faculty knowledge, course content, and the value that internships add to their educational experience.

There were some areas of concern that warrant consideration. While students felt that labs were structured to reinforce course principles, less than 60% felt that the state of lab equipment was representative of industry in several areas (testing, tooling, and decoration / assembly). Less than 70% of the students felt that the state of the processing equipment was representative of what would be found in industry.

Continually updating equipment with more current technology has always been a challenge. Faculty should consider a more formal approach for identifying areas of need and updating / modernizing lab equipment.

Possible the most urgent issue that should be addressed - 42% of students felt that, regarding the student to faculty ratio, there were "too many students". Beginning with the 2013/2014 school year, the PPET program saw a large increase in entering freshmen. This has resulted in larger lecture sizes for lower level courses and lab section overloads in many. This student concern should be addressed to ensure that it does not eventually detract from program objectives.

Findings suggested from the facilities and equipment survey and possible implementation avenues to take:

The facility and equipment survey was completed by Plastics & Rubber Department faculty. Many areas within this survey received 100% satisfaction ratings and require no attention. Among these were building security, technician availability and skills, handling breakdowns promptly, and the system for reporting breakdowns. Building cleanliness / restroom maintenance, janitorial support and office copier resources also received 100% satisfaction ratings.

Several areas warrant further attention, based on satisfaction ratings and/or written suggestions. The building HVAC system was a primary area of dissatisfaction. The system has never functioned properly and continues to be an issue. The outdated computers throughout the building and the computer lab are another area of concern. While a rumored initiative requiring students to purchase laptops may partially address this, it also will create software licensing issues.

The difficulty in obtaining lab equipment and tooling, both purchased and consigned, was also an issue. There is a lack of current, modern equipment in some areas and our limited budget is insufficient to address this. A long-term plan should be developed to address these issues.

Findings suggested from the advisory survey and possible implementation avenues to take:

The advisors to the plastics and rubber programs are most concerned about the funding support and visibility of the programs. Some of the concerns raised by the survey have been addressed, however there is still work to be done in utilization of the board as a resource. Generally, it is thought that a combined advisory board would be more effective than individual boards for Rubber and Plastics.

Findings suggested from the employer survey and possible implementation avenues to take:

Of course students have unique personal skills and experiences, and we cannot pretend to satisfy all the desire skills of individual companies. The companies who responded to our survey were satisfied with the skills obtained as students in our programs. We seem to be doing a very good job preparing the interns and graduates for the work place.

The program faculty need to investigate how well problem solving skills, program management knowledge, metrology, writing, and general trouble shooting skills are covered in the degree and strengthen those areas identified as lacking.

Appendix A

Return to Curriculum

FERRIS STATE UNIVERSITY
Imagine More

Associate in Applied Science in Plastics and Polymer Engineering Technology and Bachelor of Science in Plastics Engineering Technology Program Academic Requirements

Student:				Transfer Credits:	
Email:		ID:		GPA Major:	
Advisor:		Ph:		GPA Degree:	

ENTRY CRITERIA FOR ENTRY INTO THE ASSOCIATE DEGREE:

1. 2.5 GPA (High School or College Transfer GPA).
2. High School Algebra (or MATH 110 or equivalent) and a 19 MATH ACT; MATH 116 placement.
3. High School Chemistry (or CHEM 103)

ENTRY CRITERIA FOR ENTRY INTO THE BACHELOR DEGREE:

1. Application by March 1 prior to Fall term requested.
2. AAS in Plastics Technology.
3. 2.5 GPA in Plastics (PLTS) classes.
4. 2.5 GPA in MATH classes including MATH 116 and MATH 126.
5. 2.50 GPA overall.

ASSOCIATES in APPLIED SCIENCE

MAJOR			Cr	Gr	TR
PPET	100	Survey of Plastics and Elastomer Technology	2		
PPET	115	Plastics Product Manufacturing	2		
PPET	120	Plastics & Polymer Material Selection 1	3		
PPET	127	Introduction to Processing	4		
PPET	193	Industrial Internship	4		
PPET	211	Intro to Injection Molding	5		
PPET	212	Plastics Product Development 1	4		
PPET	223	Plastics Testing	4		
PLTS/RUBR		Major Elective (Consult with advisor)	2		
TECHNICAL RELATED					
EEET	201	Electrical Fundamentals (ACT 24 or MATH 116)	3		
ETEC	140	Engineering Graphics	3		
MECH	250	Fluid Power w/Controls (MATH 116)	2		
MFGT	150	Manufacturing Processes	2		
COMMUNICATIONS COMPETENCE					
ENGL	150	English 1 (ACT 14 or ENGL 074)	3		
ENGL	250	English 2 (ENGL 150)	3		
QUANTITATIVE					
MATH	115	Intermediate Algebra	3		
MATH	120	Numerical Trigonometry	3		
SCIENTIFIC UNDERSTANDING					
CHEM	121	General Chemistry 1 (CHEM 103 or H/S CHEM)	5		
CHEM	211	Fund. Organic/Polymer Chemistry (C- in CHEM 121)	4		
PHYS	211	Introductory Physics 1 (MATH 116 or 120 or 26 ACT	4		
CULTURAL ENRICHMENT					
		Cultural Enrichment Elective	3		
SOCIAL AWARENESS					
		Social Awareness Elective	3		
FRESHMEN SEMINAR					
FSUS	100	FSU Seminar	1		

BACHELOR of SCIENCE

MAJOR			Cr	Gr	TR
PLTS	300	Plastics Engineer Management System	4		
PLTS	312	Plastics Product & Tool Design 2	4		
PLTS	320	Plastics & Elastic Materials	3		
PLTS	321	Advanced Injection Molding	4		
PLTS	393	Industrial Internship	4		
PLTS	410	Plts Costing, Plng, & Econ Issues	3		
PLTS	411	Plastics Decorating & Assembly	4		
PLTS	499	Plastics Career Skills (PLTS 393, final semester)	1		
TECHNICAL RELATED					
EEET	301	Controls for Automation (EEET 201)	3		
MECH	340	Statics & Strengths of Mat'ls (MATH 126)	4		
MFGE	351	Intro Industrial Engineering	3		
MFGE	353	Statistical Quality Control (MATH 115)	3		
MFGE	451	Intro to Plant Engineering (Technology Student)	3		
DIRECT ELECTIVES					
		Directed Elective - Consult your department advisor	2		
COMMUNICATIONS COMPETENCE					
ENGL	311	Advanced Technical Writing (ENGL 250)	3		
COMM	121	Fundamentals of Public Speaking	3		
CULTURAL ENRICHMENT					
		Cultural Enrichment Elective	3		
		Cultural Enrichment Elective (200 level or higher)	3		
SOCIAL AWARENESS					
		Social Awareness Elective	3		
		Social Awareness Elective (200 level or higher)	3		

AAS Minimum General Education Requirements:
Cultural Enrichment (CE) – 3 credits;Social Awareness (SA) - 3 credits;
Communications - 6 credits; Scientific Understanding - 3/4 credits;

BS Minimum General Education Requirements: One course (3cr): Global Consciousness, One Course (3cr): Race/Ethnicity/Gender(REG).
One Course(3cr): Foundation – Multiple requirements may be satisfied by a single course.
Cultural Enrichment – 9 credits (3 in course > 200 level); Social Awareness - 9 credits (3 in course > 200 level)
Reference: http://www.ferris.edu/htmls/academics/genedl/gen_edspecific.html
40 credits at or above the 300 level are required in the BS program.

Contact the Plastics and Rubber Program office for more information!
Phone: 231-591-2640
Email:Plastics&Rubber@ferris.edu
www.ferris.edu/pru

Fall 2013
6/9/11

FERRIS STATE UNIVERSITY
Imagine More

Associate in Applied Science in Plastics and Polymer Engineering Technology and Bachelor of Science in Rubber Engineering Technology Program Academic Requirements

Student:				Transfer Credits:	
Email:		ID:		GPA Major:	
Advisor:		PIN:		GPA Degree:	

ENTRY CRITERIA FOR ENTRY INTO THE ASSOCIATE DEGREE:

1. 2.5 GPA (High School or College Transfer GPA).
2. H. S. Algebra or MATH 110 or equiv; and 19 MATH ACT; MATH 115 placement.
3. H. S. Chemistry (or CHEM 103).

MAJOR			Cr	Gr	TR
PPET	100	Survey of Plastics and Elastomer Technology	2		
PPET	115	Plastics Product Manufacturing	2		
PPET	120	Plastics & Polymer Material Selection 1	3		
PPET	127	Introduction to Processing	4		
PPET	193	Industrial Internship	4		
PPET	211	Introduction to Injection Molding	5		
PPET	212	Plastics Product Development 1	4		
PPET	223	Plastics Testing	4		
PLTS/RUBR		Major Elective (Consult with advisor)	2		
TECHNICAL RELATED					
EEET	201	Electrical Fundamentals (ACT 24 or MATH 116)	3		
ETEC	140	Engineering Graphics	3		
MECH	250	Fluid Powers w/Controls (MATH 116)	2		
COMMUNICATIONS COMPETENCE					
ENGL	150	English 1 (ACT 14 or ENGL 074)	3		
ENGL	250	English 2 (ENGL 150)	3		
QUANTITATIVE					
MATH	115	Intermediate Algebra	3		
MATH	120	Numerical Trigonometry	3		
SCIENTIFIC UNDERSTANDING					
CHEM	121	General Chemistry 1 (CHEM 103 or H/S CHEM)	5		
CHEM	211	Fund. Organic/Polymer Chemistry (C- in CHEM 121)	4		
PHYS	211	Introductory Physics 1 (MATH 116 or 120 or 26 ACT)	4		
CULTURAL ENRICHMENT					
		Cultural Enrichment Elective	3		
SOCIAL AWARENESS					
		Social Awareness Elective	3		
FRESHMEN SEMINAR					
FSUS	100	FSU Seminar	1		

AAS Minimum General Education Requirements:
Cultural Enrichment (CE) – 3 credits;Social Awareness (SA) - 3 credits;
Communications - 6 credits; Scientific Understanding - 3/4 credits;

ENTRY CRITERIA FOR ENTRY INTO THE BACHELOR DEGREE:

1. Application by March 1 prior to Fall term requested.
2. AAS in PPET or faculty approval.
3. 2.5 GPA in PPET classes.
4. 2.5 GPA in MATH classes including MATH 116 and MATH 126.
5. 2.50 GPA overall.

MAJOR			Cr	Gr	TR
PPET	280	Intro to Rubber Technology (PPET 100)	2		
PPET	284	Intro Thermoplastic Elastomers	2		
PLTS	300	Plastics Engineering Mgmt Systems	4		
PLTS	320	Plastics & Elastic Materials	3		
RUBR	312	Rubber Product Design	4		
RUBR	321	Rubber Compounds-Compounding	4		
RUBR	393	Rubber Internship	4		
RUBR	390	Special Topics in RUBR	4		
RUBR	390	Special Topics in RUBR	4		
RUBR	411	Advanced Rubber Processing	4		
TECHNICAL RELATED					
EEET	301	Controls of Automation (EEET 201)	3		
MECH	340	Statics & Strengths of Mat'ls (MATH 126)	4		
MFGE	351	Intro Industrial Engineering	3		
MFGE	353	Statistical Quality Control (MATH 115)	3		
MFGE	451	Intro to Plant Engineering (Technology Student)	3		
COMMUNICATIONS COMPETENCE					
ENGL	311	Advanced Technical Writing (ENGL 250)	3		
COMM	121	Fundamentals of Public Speaking	3		
CULTURAL ENRICHMENT					
		Cultural Enrichment Elective	3		
		Cultural Enrichment Elective (200 level or higher)	3		
SOCIAL AWARENESS					
		Social Awareness Elective	3		
		Social Awareness Elective (200 level or higher)	3		

BS General Education Requirements:
Communication competence: Total of 12 credits
Cultural Enrichment-9 credits (3 in course > 200 level); Social Awareness-9 credits (3 in course > 200 level)
3 credits: Global Consciousness, 3 credits: Race/Ethnicity/Gender(REG),
3 credits: Foundation -- Multiple requirements may be satisfied by a single course.
Reference: http://www.ferris.edu/htmls/academics/genedl/gen_edspecific.html
40 credits at or above the 300 level are required in the BS program.

Contact the Plastics and Rubber Program office
for more information!
Phone: 231-591-2640
Email:Plastics&Rubber@ferris.edu
www.ferris.edu/piru

Fall 2013
4/17/13

FERRIS STATE UNIVERSITY
Imagine More

Associate in Applied Science in Plastics and Polymer Engineering Technology and Bachelor of Science in Plastics Engineering Technology Program Academic Requirements

Student:				Transfer Credits:	
Email:		ID:		GPA Major:	
Advisor:		Ph:		GPA Degree:	

ENTRY CRITERIA FOR ENTRY INTO THE ASSOCIATE DEGREE:

1. 2.5 GPA (High School or College Transfer GPA).
2. High School Algebra (or MATH 110 or equivalent) and a 19 MATH ACT; MATH 116 placement.
3. High School Chemistry (or CHEM 103)

ENTRY CRITERIA FOR ENTRY INTO THE BACHELOR DEGREE:

1. Application by March 1 prior to Fall term requested.
2. AAS in Plastics Technology.
3. 2.5 GPA in Plastics (PLTS) classes.
4. 2.5 GPA in MATH classes including MATH 116 and MATH 126.
5. 2.50 GPA overall.

ASSOCIATES in APPLIED SCIENCE

MAJOR			Cr	Gr	TR
PPET	100	Survey of Plastics and Elastomer Technology	2		
PPET	115	Plastics Product Manufacturing	2		
PPET	120	Plastics & Polymer Material Selection 1	3		
PPET	127	Introduction to Processing	4		
PPET	193	Industrial Internship	4		
PPET	211	Intro to Injection Molding	5		
PPET	212	Plastics Product Development 1	4		
PPET	223	Plastics Testing	4		
PLTS/RUBR		Major Elective (Consult with advisor)	2		
TECHNICAL RELATED					
EEET	201	Electrical Fundamentals (ACT 24 or MATH 116)	3		
ETEC	140	Engineering Graphics	3		
MECH	250	Fluid Power w/Controls (MATH 116)	2		
MFGT	150	Manufacturing Processes	2		
COMMUNICATIONS COMPETENCE					
ENGL	150	English 1 (ACT 14 or ENGL 074)	3		
ENGL	250	English 2 (ENGL 150)	3		
QUANTITATIVE					
MATH	115	Intermediate Algebra	3		
MATH	120	Numerical Trigonometry	3		
SCIENTIFIC UNDERSTANDING					
CHEM	121	General Chemistry 1 (CHEM 103 or H/S CHEM)	5		
CHEM	211	Fund. Organic/Polymer Chemistry (C- in CHEM 121)	4		
PHYS	211	Introductory Physics 1 (MATH 116 or 120 or 26 ACT	4		
CULTURAL ENRICHMENT					
		Cultural Enrichment Elective	3		
SOCIAL AWARENESS					
		Social Awareness Elective	3		
FRESHMEN SEMINAR					
FSUS	100	FSU Seminar	1		

BACHELOR of SCIENCE

MAJOR			Cr	Gr	TR
PLTS	300	Plastics Engineer Management System	4		
PLTS	312	Plastics Product & Tool Design 2	4		
PLTS	320	Plastics & Elastic Materials	3		
PLTS	321	Advanced Injection Molding	4		
PLTS	393	Industrial Internship	4		
PLTS	410	Plts Costing, Plng, & Econ Issues	3		
PLTS	411	Plastics Decorating & Assembly	4		
PLTS	499	Plastics Career Skills (PLTS 393, final semester)	1		
TECHNICAL RELATED					
EEET	301	Controls for Automation (EEET 201)	3		
MECH	340	Statics & Strengths of Mat'ls (MATH 126)	4		
MFGE	351	Intro Industrial Engineering	3		
MFGE	353	Statistical Quality Control (MATH 115)	3		
MFGE	451	Intro to Plant Engineering (Technology Student)	3		
DIRECT ELECTIVES					
		Directed Elective - Consult your department advisor	2		
COMMUNICATIONS COMPETENCE					
ENGL	311	Advanced Technical Writing (ENGL 250)	3		
COMM	121	Fundamentals of Public Speaking	3		
CULTURAL ENRICHMENT					
		Cultural Enrichment Elective	3		
		Cultural Enrichment Elective (200 level or higher)	3		
SOCIAL AWARENESS					
		Social Awareness Elective	3		
		Social Awareness Elective (200 level or higher)	3		

AAS Minimum General Education Requirements:
Cultural Enrichment (CE) – 3 credits;Social Awareness (SA) - 3 credits;
Communications - 6 credits; Scientific Understanding - 3/4 credits;

BS Minimum General Education Requirements: One course (3cr): Global Consciousness, One Course (3cr): Race/Ethnicity/Gender(REG), One Course(3cr): Foundation – Multiple requirements may be satisfied by a single course. Cultural Enrichment – 9 credits (3 in course > 200 level); Social Awareness - 9 credits (3 in course > 200 level)
Reference: http://www.ferris.edu/htmls/academics/genedlgen_edspecific.html
40 credits at or above the 300 level are required in the BS program.

Contact the Plastics and Rubber Program office for more information!
Phone: 231-591-2640
EmailPlastics&Rubber@ferris.edu
www.ferris.edu/plru

Fall 2013
6/8/11

Back to Curriculum

Ferris State University

Plastics and Rubber Engineering Technology Academic program review

Advisory Board In put

a. Survey
b. Survey results
c. Summery
d. Conclusions

PLTE APR Frequencies...Advisory Board

Prepared by: Institutional Research & Testing, 08/14

Statistics

	N		Mean	Median	Std. Deviation
	Valid	Missing			
q1 Yrs served on advisory bd	6	0			
q2 Yrs worked in industry	6	0			
q3 Current job title	6	0			
q4 Attend classes in Plastics or Rubber	6	0	1.50	1.50	.548
q5 Company hired Plastics/Rubber grads/interns	6	0	1.00	1.00	.000
q6a Is keeping with industry trends & changes	6	0	3.17	3.50	1.169
q6b Satisfies a broad range of industries	6	0	3.17	3.00	.753
q6c Has a good balance of hands-on vs. theory education	6	0	3.50	4.00	1.225
q7a Is updated to reflect latest technology used in industry	6	0	2.17	2.00	.753
q7b Is maintained in good running condition	6	0	2.17	2.00	1.169
q7c Is sufficient for the number of students enrolled	6	0	2.67	3.00	.516
q7d Meets health & safety standards	6	0	3.33	3.50	.816

q7e Is appropriately funded by the university	6	0	1.83	2.00	.753
q7f Represents sound industry standards	6	0	2.83	3.00	.753
q8a Knows the level of need for professionals in industries	6	0	3.50	4.00	.837
q8b Are valuable to the student	6	0	3.50	3.50	.548
q8c Shows that industry comes looking for students	6	0	3.67	4.00	.516
q9a Is adequate in student to instructor ratio	6	0	2.67	3.00	.516
q9b Has sufficient opportunity to grow with industry	6	0	2.83	3.00	.753
q9c Is represented by strong leadership practices & has a voice	6	0	2.17	2.00	1.169
q9d Is actively promoting the FSU Plastics & Rubber programs to industry	6	0	3.33	3.00	.516
q10a Time is used wisely & input is considered/utilized	6	0	3.00	3.00	.632
q10b Meeting agendas are appropriate for giving direction	6	0	3.50	3.50	.548
q10c Occur often enough to help keep programs on track	6	0	3.00	3.00	.632
q10d Board is provided adequate & proper direction to function efficiently	6	0	2.83	3.00	.408
q11 Change in academic offerings	6	0			
q12 Suggest to better utilize advisory board members	6	0			
q13 Additional comments/suggestions	6	0			

Frequency Table

q1 Yrs served on advisory bd

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<1	1	16.7	16.7	16.7
	1	1	16.7	16.7	33.3
	12	1	16.7	16.7	50.0
	15	1	16.7	16.7	66.7
	5	1	16.7	16.7	83.3
	6	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q2 Yrs worked in industry

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	10	1	16.7	16.7	16.7
	21	1	16.7	16.7	33.3
	25	1	16.7	16.7	50.0
	29	1	16.7	16.7	66.7
	35	1	16.7	16.7	83.3
	6	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q3 Current job title

		Frequency	Percent	Valid Percent
Valid	Chief Engineer	1	16.7	16.7
	Development Chemist	1	16.7	16.7
	Global Director Advanced Materials Development	1	16.7	16.7
	Senior Design Engineer	1	16.7	16.7
	Technical Services Manager	2	33.3	33.3
	Total	6	100.0	100.0

q3 Current job title

		Cumulative Percent
Valid	Chief Engineer	16.7
	Development Chemist	33.3
	Global Director Advanced Materials Development	50.0
	Senior Design Engineer	66.7
	Technical Services Manager	100.0
	Total	

q4 Attend classes in Plastics or Rubber

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	3	50.0	50.0	50.0
	No	3	50.0	50.0	100.0
	Total	6	100.0	100.0	

q5 Company hired Plastics/Rubber grads/interns

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	6	100.0	100.0	100.0

q6a Is keeping with industry trends & changes

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	16.7	16.7	16.7
	Somewhat Agree	2	33.3	33.3	50.0
	Strongly Agree	3	50.0	50.0	100.0
	Total	6	100.0	100.0	

q6b Satisfies a broad range of industries

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	1	16.7	16.7	16.7
	Somewhat Agree	3	50.0	50.0	66.7
	Strongly Agree	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q6c Has a good balance of hands-on vs. theory education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	16.7	16.7	16.7
	Strongly Agree	5	83.3	83.3	100.0
	Total	6	100.0	100.0	

q7a Is updated to reflect latest technology used in industry

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	16.7	16.7	16.7
	Somewhat Disagree	3	50.0	50.0	66.7
	Somewhat Agree	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q7b Is maintained in good running condition

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	33.3	33.3	33.3
	Somewhat Disagree	2	33.3	33.3	66.7
	Somewhat Agree	1	16.7	16.7	83.3
	Strongly Agree	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q7c Is sufficient for the number of students enrolled

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	2	33.3	33.3	33.3
	Somewhat Agree	4	66.7	66.7	100.0
	Total	6	100.0	100.0	

q7d Meets health & safety standards

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	1	16.7	16.7	16.7
	Somewhat Agree	2	33.3	33.3	50.0
	Strongly Agree	3	50.0	50.0	100.0
	Total	6	100.0	100.0	

q7e Is appropriately funded by the university

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	33.3	33.3	33.3
	Somewhat Disagree	3	50.0	50.0	83.3
	Somewhat Agree	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q7f Represents sound industry standards

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	2	33.3	33.3	33.3
	Somewhat Agree	3	50.0	50.0	83.3
	Strongly Agree	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q8a Knows the level of need for professionals in industries

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	1	16.7	16.7	16.7
	Somewhat Agree	1	16.7	16.7	33.3
	Strongly Agree	4	66.7	66.7	100.0
	Total	6	100.0	100.0	

q8b Are valuable to the student

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Agree	3	50.0	50.0	50.0
	Strongly Agree	3	50.0	50.0	100.0
	Total	6	100.0	100.0	

q8c Shows that industry comes looking for students

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Agree	2	33.3	33.3	33.3
	Strongly Agree	4	66.7	66.7	100.0
	Total	6	100.0	100.0	

q9a Is adequate in student to instructor ratio

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	2	33.3	33.3	33.3
	Somewhat Agree	4	66.7	66.7	100.0
	Total	6	100.0	100.0	

q9b Has sufficient opportunity to grow with industry

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	2	33.3	33.3	33.3
	Somewhat Agree	3	50.0	50.0	83.3
	Strongly Agree	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q9c Is represented by strong leadership practices & has a voice

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	33.3	33.3	33.3
	Somewhat Disagree	2	33.3	33.3	66.7
	Somewhat Agree	1	16.7	16.7	83.3
	Strongly Agree	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q9d Is actively promoting the FSU Plastics & Rubber programs to industry

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Agree	4	66.7	66.7	66.7
	Strongly Agree	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q10a Time is used wisely & input is considered/utilized

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	1	16.7	16.7	16.7
	Somewhat Agree	4	66.7	66.7	83.3
	Strongly Agree	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q10b Meeting agendas are appropriate for giving direction

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Agree	3	50.0	50.0	50.0
	Strongly Agree	3	50.0	50.0	100.0
	Total	6	100.0	100.0	

q10c Occur often enough to help keep programs on track

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	1	16.7	16.7	16.7
	Somewhat Agree	4	66.7	66.7	83.3
	Strongly Agree	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q10d Board is provided adequate & proper direction to function efficiently

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	1	16.7	16.7	16.7
	Somewhat Agree	5	83.3	83.3	100.0
	Total	6	100.0	100.0	

q11 Change in academic offerings

		Frequency	Percent	Valid Percent
Valid		1	16.7	16.7
	Additional Lab time is required in Associates degree, particularly for those thinking about going into the rubber field. Interns from the associate degree are not currently always prepared to do well in an internship. Too much time is spent on teaching injection molding, and not enough in other aspects of processing and testing. More management/quality skills training for students would be useful.	1	16.7	16.7
	I believe the program is offer the best it can considering the public interest in the rubber industry.	1	16.7	16.7
	Increase the instructor diversity in the Rubber Program, mix with Plastics (as has been done) bring in industrial experts or consultants.	1	16.7	16.7
	Offer more Rubber based classes for the Associates program. Offer courses/training on how to work within a global organization.	1	16.7	16.7
	The program is light on mathmatics and chemistry. There is a lack of process engineering as well as structured problem solving. Little science is injected into how and why processes are established. Basics such as thermal transport (directly related to rubber curing in a mold) are missing. The current program has too little rubber technology.	1	16.7	16.7
	Total	6	100.0	100.0

q11 Change in academic offerings

		Cumulative Percent
Valid		16.7
	Additional Lab time is required in Associates degree, particularly for those thinking about going into the rubber field. Interns from the associate degree are not currently always prepared to do well in an internship. Too much time is spent on teaching injection molding, and not enough in other aspects of processing and testing. More management/quality skills training for students would be useful.	33.3
	I believe the program is offer the best it can considering the public interest in the rubber industry.	50.0
	Increase the instructor diversity in the Rubber Program, mix with Plastics (as has been done) bring in industrial experts or consultants.	66.7
	Offer more Rubber based classes for the Associates program. Offer courses/training on how to work within a global organization.	83.3
	The program is light on mathmatics and chemistry. There is a lack of process engineering as well as structured problem solving. Little science is injected into how and why processes are established. Basics such as thermal transport (directly related to rubber curing in a mold) are missing. The current program has too little rubber technology.	100.0
	Total	

q12 Suggest to better utilize advisory board members

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		2	33.3	33.3	33.3
	Follow up on actions taken during meetings	1	16.7	16.7	50.0
	Have additional collaborative projects, with specific assignments and action items, between the advisory boards and program leadership.	1	16.7	16.7	66.7

	Have additional collaborative projects, with specific assignments and action items, between the advisory boards and program leadership.	1	16.7	16.7	66.7
	I've only attended one meeting, but so far I haven't seen any follow up minutes or action items.	1	16.7	16.7	83.3
	Listen to what we are telling you and incorporate our feedback.	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q13 Additional comments/suggestions

	Frequency	Percent	Valid Percent

Valid		4	66.7	66.7
	As I mentioned I have only been on the board for a few months and attended one meeting so I will look forward to integrating further into the board before I can have stronger opinions.	1	16.7	16.7
	The last two advisory board meetings have been much more productive than past advisory board meetings since the meeting style was changed to invite more discussion of problems and tentative action items. It was also useful to have both the Plastics and Rubber advisory boards meet together, because we are both in the same boat and need to work together. Use of action items that can be measured/evaluated at each advisory board meeting would be very useful.	1	16.7	16.7
	Total	6	100.0	100.0

q13 Additional comments/suggestions

		Cumulative Percent
Valid		66.7
	As I mentioned I have only been on the board for a few months and attended one meeting so I will look forward to integrating further into the board before I can have stronger opinions.	83.3
	The last two advisory board meetings have been much more productive than past advisory board meetings since the meeting style was changed to invite more discussion of problems and tentative action items. It was also useful to have both the Plastics and Rubber advisory boards meet together, because we are both in the same boat and need to work together. Use of action items that can be measured/evaluated at each advisory board meeting would be very useful.	100.0
	Total	

SUMMARY:

Over half of the advisors who responded are alumni of the program which might skew the results a little. Also, there is one detractor who consistently responded with low or negative scores.

In general the advisors thought the programs offered a good balance of "hands-on" education combined with theory in the classroom (Q6c), typically adheres to health and safety standards required by the industry (Q7d) and follow industry standards (Q7f). Additionally, they recognized the need for our graduates by industry (Q7c) and find the faculty student ratio adequate for a sound educational experience.

The advisors also voiced some concern for the programs indicating the programs not reflecting the latest technology (Q7a) and the equipment is in poor or not operational condition (Q7b). In addition, they expressed concern for lack of funding (Q7d), of course this is exasperated by a recent, significant increase in enrollment with no change in budget. Additionally, there was low support for the leadership of the program having a voice in University operations (Q9c).

Additional comments made by the advisors are as follows.

" More management/quality skills training" this is being addressed in a curriculum submission where student will have the option to earn a Quality certificate as part to the BS degree requirements.

"more faculty diversity for the rubber program" this is being addressed in a curriculum submission as well as the addition of Marc Guske to the faculty.

"Program is light on Mathematics and Chemistry", this could be perceived as true, and the program faculty have met and discussed this at length and have concluded that both chemistry and math are applied in program classes in at the BS level.

"Basics of thermal transport are missing and there is too little "Rubber" in the current program". The faculty in spirit agree with this statement, however what should be removed to add a heat transfer course? Also, the rubber content in the Rubber Engineering Technology degree is too little. This is a reflection of curricular modifications to protect the program due to low enrollment. The faculty thought it prudent to get the students into the University in a common AAS and then expose them to Rubber and hope that more would matriculate into the program.

Regarding the function of the advisory board(s) most agreed a common group (combined plastics and rubber professionals) is a good idea. Generally, it is interpreted that there could be more gained from the board by assigning "follow up actions, collaborative projects, with specific assignments" and "action items", also reflected in (Q10c, Q10d). This effort is on-going, the faculty are trying to increase their expectation from the board however it is a slow process.

CONCLUSION:

The advisors to the plastics and rubber programs are most concerned about the funding support and visibility of the programs. Some of the concerns raised by the survey have been addressed, however there is still work to be done in utilization of the board as a resource. Generally, it is thought that a combined advisory board would be more effective than individual boards for Rubber and Plastics

FERRIS STATE UNIVERSITY
IMAGINE MORE

Plastics Engineering Technology APR Survey - Alumni

As part of the Academic Program Review (APR) process, the Plastics and Rubber Department is asking the graduates of Ferris State University Plastics and Rubber Programs to please take a few minutes to complete this short 24-question survey. Your responses will help us better evaluate the current program and curriculum. The results taken from this survey, together along with other survey instruments and data glean from the industry, will allow us to better understand where our strengths lie and to identify areas for improvement as well as refocusing our goals if necessary. Thank you for your time, thoughts and efforts in completing this survey instrument.

Q1 Are you a Plastics or Rubber graduate? Select both if you were a dual degree graduate.

- [ ] Plastics
- [ ] Rubber

Q2 In what year did you receive you Plastics/Rubber A.A.S. degree from Ferris?

Q3 In what year did you receive you Plastics/Rubber B.S. degree from Ferris?

Q4 Which of the following is the highest degree you have earned at this point in your career?

- ○ AAS
- ○ BS
- ○ MBA
- ○ MS/MA
- ○ PhD

Q5 Are you currently employed in the Plastics or Rubber industry?

- ○ Yes
- ○ No

Q6 Why did you leave the industry?

Q7 How many years have you (or were you) employed within the Plastics or Rubber industry?

Q8 How many job changes have you made since graduating from FSU?

Q9 Which of the following best describes the function you perform? (Please select only one.)

- Sales & Marketing
- Process/Production Engineer
- Management/Administration
- Product Design/Development
- Technical Service
- Education/Training
- Project Management
- Quality Control
- Cost Estimating
- Purchasing
- Mold Design
- Mold Making
- Mold Repair/Maintenance
- Owner
- Other

Please Specify:

Q10 Please provide your current job title here.

Q11 Which of the following processes does your company have in-house? (Please select all that apply.)

- [ ] Injection Molding
- [ ] Compression Molding
- [ ] Transfer Molding
- [ ] Thermoforming
- [ ] RIM
- [ ] Blow Molding
- [ ] Extrusion
- [ ] Composites
- [ ] Decorating/Finishing
- [ ] Assembly
- [ ] Other

Please Specify:

Q12 In what country are you working (where is your home-base)?

Q13 In what state do you work? (Please skip if answer to question 12 is outside the U.S.)

Q14 How satisfied are you with your current career choice?

- ○ Dissatisfied
- ○ Neutral
- ○ Satisfied

Q15 How do you perceive the opportunities for career growth within the industry?

- ○ Poor
- ○ Average
- ○ Excellent

Q16 How do you perceive the opportunities for lateral movement within the industry?

- ○ Poor
- ○ Average
- ○ Excellent

Please rate these next areas based upon your academic training experiences at Ferris.

Q17 How well do you feel you were prepared upon graduation for your first job in the industry?

- ◯ Unprepared
- ◯ Adequately prepared
- ◯ Well prepared

Q18 How valuable were those two internship experiences to your over-all learning and preparation for a career in the industry?

- ◯ Useless
- ◯ Necessary
- ◯ Vital

Q19 How valuable were the laboratory experiences to enhancing the practical side of learning for you?

- ◯ Useless
- ◯ Necessary
- ◯ Vital

Q20 Please indicate your opinion of each of the following:

	Sparse	Adequate	Crowded
The lab density section in the Plastics/Rubber courses (the number of students per lab section)	◯	◯	◯
The classroom density in the Plastics/Rubber courses (the number of students per lecture class)	◯	◯	◯

Q21 Please indicate your opinion of each of the following:

	Inadequate	Adequate	Excellent
The quality of instruction you received in the Plastics and Rubber courses	◯	◯	◯
The teaching expertise of the faculty in general	◯	◯	◯
The laboratory equipment you worked with in the processing labs	◯	◯	◯
The laboratory equipment you worked with in the testing labs	◯	◯	◯
The laboratory equipment you worked with in the mold design labs	◯	◯	◯

Q22 Please rate each subject area individually according to how much of a balanced curriculum you feel it should consume based upon what was presented during your academic experience:

	Lacking	Adequate	Excessive
Injection Molding Processing	○	○	○
Extrusion Molding Processing	○	○	○
Thermoforming Processes	○	○	○
Blow Molding Processes	○	○	○
Composites	○	○	○
Physical Properties of Polymers (Testing)	○	○	○
Mold Design	○	○	○
Part Design	○	○	○
Decoration and Assembly	○	○	○
Project Management	○	○	○
Materials (selection)	○	○	○
Automation (Robotics)	○	○	○

Q23 Should the Ferris Plastics/Rubber programs pursue offering online technical courses?

- ○ Yes
- ○ No

Q24 Based upon the curriculum at the time you were a student in the program, please list the courses/subject areas (not just the technical courses) that you feel were missing from the curriculum.

Comments are not easily captured in quantifiable data form that can be manipulated statistically, however these are still an important part of any serious assessment of a curriculum. This last question then is to allow you to add any additional comments to either explain the answers given above or to express some other thought that you feel was not captured in this survey. Please remember that though we are interested in what could be improved in the program it is also of importance to have a sense of what to keep, so try to be balanced in your choice of comments here. Keep in mind that often when something is added or changed in a curriculum, it is inevitable that something else must then be deleted or altered to accommodate or facilitate the change or addition. In other words, we also need to know what we are doing right.

Note: There is a software limitation on the number of characters that can be entered in any single response, thus a second question area is provided to allow you to continue your thoughts should you reach the limit in the prior question response area.

Q25 Please use this space for additional comments.

Q26 Please use this space for additional comments, if needed.

Thank you for your time and input.

PLTE APR Frequencies ...Alumni

Prepared by: Institutional Research & Testing, 08/14

Statistics

	N				
	Valid	Missing	Mean	Median	Std. Deviation
q1_1 Grad: Plastics	89	0	.96	1.00	.208
q1_2 Grad: Rubber	89	0	.07	.00	.252
q2 Yr received AAS	89	0			
q3 Yr received BS	89	0			
q4 Highest degree earned	89	0	2.12	2.00	.781
q5 Currently employed in industry	88	1	1.22	1.00	.414
q6 Why leave industry	89	0			
q7 How many yrs employed in industry	89	0			
q8 How many jo changes since graduation	89	0			
q9 Best decribes your function	88	1	4.14	3.00	3.267
q9a Other specified	89	0			
q10 Job title	89	0			
q11_1 In-house processes: Injection Molding	84	5	.62	1.00	.489
q11_2 In-house processes: Compression Molding	84	5	.14	.00	.352
q11_3 In-house processes: Transfer Molding	84	5	.05	.00	.214
q11_4 In-house processes: Thermoforming	84	5	.11	.00	.311
q11_5 In-house processes: RIM	84	5	.06	.00	.238
q11_6 In-house processes: Blow Molding	84	5	.10	.00	.295
q11_7 In-house processes: Extrusion	84	5	.21	.00	.413
q11_8 In-house processes: Composites	84	5	.06	.00	.238
q11_9 In-house processes: Decorating/Finishing	84	5	.32	.00	.470
q11_10 In-house processes: Assembly	84	5	.42	.00	.496
q11_11 In-house processes: Other	84	5	.39	.00	.491
q11a Other specified	89	0			
q12 In what country do you work	89	0			
q13 In what state do you work	89	0			
q14 Satisfied with career choice	89	0	2.90	3.00	.303
q15 Perceive opportunities for career growth in industry	88	1	2.49	3.00	.567
q16 Perceive opportunities for lateral movement in industry	88	1	2.63	3.00	.510
q17 How prepared for first job in industry	89	0	2.56	3.00	.563
q18 How valuable were internships	87	2	2.63	3.00	.573
q19 How valuable were lab experiences	87	2	2.74	3.00	.469
q20a Opinion of lab density	89	0	2.01	2.00	.282
q20b Opinion of classroom density	89	0	1.99	2.00	.184
q21a Quality of instruction received in courses	89	0	2.67	3.00	.517
q21b The teaching expertise of the faculty in general	89	0	2.66	3.00	.499
q21c The lab equipment in the processing labs	89	0	2.30	2.00	.531
q21d The lab equipment in the testing labs	89	0	2.26	2.00	.534
q21e The lab equipment in the mold design labs	89	0	2.01	2.00	.593

Statistics

	N				
	Valid	Missing	Mean	Median	Std. Deviation
q22a Injection Molding Processing	87	2	2.14	2.00	.462
q22b Extrusion Molding Processing	87	2	1.82	2.00	.495
q22c Thermoforming Processes	87	2	1.98	2.00	.403
q22d Blow Molding Processes	87	2	1.94	2.00	.466
q22e Composites	87	2	1.67	2.00	.604
q22f Physical Properties of Polymers	87	2	1.95	2.00	.480
q22g Mold Design	87	2	1.66	2.00	.524
q22h Part Design	87	2	1.66	2.00	.567
q22i Decoration and Assembly	87	2	1.80	2.00	.478
q22j Project Management	87	2	1.46	1.00	.546
q22k Materials	87	2	1.83	2.00	.511
q22l Automation	87	2	1.26	1.00	.469
q23 Pursue offering online technical courses	89	0	1.42	1.00	.496
q24 Courses feel missing from curriculum	89	0			
q25 Additional comments	89	0			
q26 Additional comments cont'd	89	0			

Frequency Table

q1_1 Grad: Plastics

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	4	4.5	4.5	4.5
	Selected	85	95.5	95.5	100.0
	Total	89	100.0	100.0	

q1_2 Grad: Rubber

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	83	93.3	93.3	93.3
	Selected	6	6.7	6.7	100.0
	Total	89	100.0	100.0	

q2 Yr received AAS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		6	6.7	6.7	6.7
	1973	2	2.2	2.2	9.0
	1975	2	2.2	2.2	11.2
	1978	1	1.1	1.1	12.4
	1979	1	1.1	1.1	13.5
	1980	1	1.1	1.1	14.6
	1981	1	1.1	1.1	15.7
	1983	1	1.1	1.1	16.9
	1984	2	2.2	2.2	19.1
	1985	3	3.4	3.4	22.5
	1986	1	1.1	1.1	23.6
	1988	1	1.1	1.1	24.7
	1989	1	1.1	1.1	25.8
	1991	2	2.2	2.2	28.1
	1992	4	4.5	4.5	32.6
	1993	4	4.5	4.5	37.1
	1994	4	4.5	4.5	41.6
	1995	3	3.4	3.4	44.9
	1996	3	3.4	3.4	48.3
	1997	1	1.1	1.1	49.4
	1998	3	3.4	3.4	52.8
	1999	1	1.1	1.1	53.9
	2000	6	6.7	6.7	60.7
	2000,2003	1	1.1	1.1	61.8
	2001	5	5.6	5.6	67.4
	2002	5	5.6	5.6	73.0
	2003	3	3.4	3.4	76.4
	2004	1	1.1	1.1	77.5
	2005	1	1.1	1.1	78.7
	2006	3	3.4	3.4	82.0
	2007	4	4.5	4.5	86.5
	2008	3	3.4	3.4	89.9
	2009	1	1.1	1.1	91.0
	2012	3	3.4	3.4	94.4

q2 Yr received AAS

		Frequency	Percent	Valid Percent	Cumulative Percent
	2013	3	3.4	3.4	97.8
	98	1	1.1	1.1	98.9
	n/a	1	1.1	1.1	100.0
	Total	89	100.0	100.0	

q3 Yr received BS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		14	15.7	15.7	15.7
	00	1	1.1	1.1	16.9
	1985	1	1.1	1.1	18.0
	1987	1	1.1	1.1	19.1
	1988	1	1.1	1.1	20.2
	1989	1	1.1	1.1	21.3
	1990	1	1.1	1.1	22.5
	1991	2	2.2	2.2	24.7
	1992	2	2.2	2.2	27.0
	1993	3	3.4	3.4	30.3
	1994	4	4.5	4.5	34.8
	1995	1	1.1	1.1	36.0
	1996	3	3.4	3.4	39.3
	1997	1	1.1	1.1	40.4
	1998	5	5.6	5.6	46.1
	1999	2	2.2	2.2	48.3
	2000	2	2.2	2.2	50.6
	2001	2	2.2	2.2	52.8
	2002	5	5.6	5.6	58.4
	2003	4	4.5	4.5	62.9
	2004	7	7.9	7.9	70.8
	2005	1	1.1	1.1	71.9
	2006	1	1.1	1.1	73.0
	2007	2	2.2	2.2	75.3
	2008	3	3.4	3.4	78.7
	2009	3	3.4	3.4	82.0
	2010	3	3.4	3.4	85.4
	2012	1	1.1	1.1	86.5
	2014	4	4.5	4.5	91.0
	2015	1	1.1	1.1	92.1
	90	1	1.1	1.1	93.3
	Did not	1	1.1	1.1	94.4
	N/A	3	3.4	3.4	97.8
	na	1	1.1	1.1	98.9
	not completed	1	1.1	1.1	100.0
	Total	89	100.0	100.0	

q4 Highest degree earned

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	AAS	13	14.6	14.6	14.6
	BS	60	67.4	67.4	82.0
	MBA	9	10.1	10.1	92.1
	MS/MA	6	6.7	6.7	98.9
	PhD	1	1.1	1.1	100.0
	Total	89	100.0	100.0	

q5 Currently employed in industry

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	69	77.5	78.4	78.4
	No	19	21.3	21.6	100.0
	Total	88	98.9	100.0	
Missing	System	1	1.1		
Total		89	100.0		

q6 Why leave industry

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		70	78.7	78.7	78.7
	Better opportunity in metals industry.	1	1.1	1.1	79.8
	Career developed to Management in another Technical field.	1	1.1	1.1	80.9
	Disliked the work	1	1.1	1.1	82.0
	Economy- I didnt want to move for work.	1	1.1	1.1	83.1
	good job offer	1	1.1	1.1	84.3
	I became a teacher. I do teach plastics at our high school	1	1.1	1.1	85.4
	I did not enjoy it	1	1.1	1.1	86.5
	I was never in it	1	1.1	1.1	87.6
	I work for a printer manufacturing company and project management opportunities became available to me.	1	1.1	1.1	88.8
	Lack of employment on the west coast	1	1.1	1.1	89.9
	Lack of improvement	1	1.1	1.1	91.0
	Lost Foam Metal Casting Plant in Saginaw stop producing Lost Foam Castings....so it left me.... GM SMCO is the Plant in Saginaw MI	1	1.1	1.1	92.1
	Loved working in the plastics/automotive industry. Left to pursue PhD and to teach at a University.	1	1.1	1.1	93.3
	My career took me to the Consumer Products Goods (CPG) companies to apply the plastics learning to the packaging side of the business.	1	1.1	1.1	94.4
	Retired to work in education.	1	1.1	1.1	95.5
	Same job responsibilities used in the plastics industry in the beginning of my career has allowed me to become very versatile with multiple materials used in the automotive industry. Plus I still work with plastics clips and we just ordered a heat stake machine.	1	1.1	1.1	96.6

q6 Why leave industry

		Frequency	Percent	Valid Percent	Cumulative Percent
	The company I work for is involved in the filtration of polymer, but we do not manufacture raw polymer, plastic parts or plastic components.	1	1.1	1.1	97.8
	The employer I was working for closed their business. The job I found after that was in the optics/laser/photonics industry.	1	1.1	1.1	98.9
	Turbulence in automotive industry	1	1.1	1.1	100.0
	Total	89	100.0	100.0	

q7 How many yrs employed in industry

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	1.1	1.1	1.1
	<1	1	1.1	1.1	2.2
	0	2	2.2	2.2	4.5
	1	1	1.1	1.1	5.6
	10	6	6.7	6.7	12.4
	11	1	1.1	1.1	13.5
	11.5	1	1.1	1.1	14.6
	12	4	4.5	4.5	19.1
	13	4	4.5	4.5	23.6
	14	3	3.4	3.4	27.0
	15	5	5.6	5.6	32.6
	16	3	3.4	3.4	36.0
	17	1	1.1	1.1	37.1
	18	3	3.4	3.4	40.4
	2	1	1.1	1.1	41.6
	2 months	1	1.1	1.1	42.7
	2.5	1	1.1	1.1	43.8
	20	4	4.5	4.5	48.3
	21	3	3.4	3.4	51.7
	22	1	1.1	1.1	52.8
	23	3	3.4	3.4	56.2
	24	2	2.2	2.2	58.4
	26	3	3.4	3.4	61.8
	27	1	1.1	1.1	62.9
	29	1	1.1	1.1	64.0
	3	3	3.4	3.4	67.4
	30	2	2.2	2.2	69.7
	30 years	1	1.1	1.1	70.8
	31	1	1.1	1.1	71.9
	32	1	1.1	1.1	73.0
	35	2	2.2	2.2	75.3
	39	1	1.1	1.1	76.4
	4	3	3.4	3.4	79.8
	43	1	1.1	1.1	80.9
	5	4	4.5	4.5	85.4
	6	5	5.6	5.6	91.0
	7	2	2.2	2.2	93.3
	8	2	2.2	2.2	95.5

q7 How many yrs employed in industry

		Frequency	Percent	Valid Percent	Cumulative Percent
	9	3	3.4	3.4	98.9
	Less than one	1	1.1	1.1	100.0
	Total	89	100.0	100.0	

q8 How many jo changes since graduation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	1.1	1.1	1.1
	0	15	16.9	16.9	18.0
	1	9	10.1	10.1	28.1
	10	3	3.4	3.4	31.5
	11 titles assume positions no employer	1	1.1	1.1	32.6
	12	1	1.1	1.1	33.7
	2	12	13.5	13.5	47.2
	2 companies, 8 positions	1	1.1	1.1	48.3
	3	17	19.1	19.1	67.4
	4	8	9.0	9.0	76.4
	5	9	10.1	10.1	86.5
	6	5	5.6	5.6	92.1
	6 (all with the same company)	1	1.1	1.1	93.3
	7	4	4.5	4.5	97.8
	lots	1	1.1	1.1	98.9
	Two	1	1.1	1.1	100.0
	Total	89	100.0	100.0	

q9 Best decribes your function

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Sales & Marketing	17	19.1	19.3	19.3
	Process/Production Engineer	17	19.1	19.3	38.6
	Management/Administration	16	18.0	18.2	56.8
	Product Design/Development	12	13.5	13.6	70.5
	Technical Service	2	2.2	2.3	72.7
	Education/Training	1	1.1	1.1	73.9
	Project Management	13	14.6	14.8	88.6
	Quality Control	3	3.4	3.4	92.0
	Cost Estimating	1	1.1	1.1	93.2
	Purchasing	1	1.1	1.1	94.3
	Mold Design	2	2.2	2.3	96.6
	Other	3	3.4	3.4	100.0
	Total	88	98.9	100.0	
Missing	System	1	1.1		
Total		89	100.0		

q9a Other specified

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		74	83.1	83.1	83.1
	Automation Engineer	1	1.1	1.1	84.3
	Delphi Automotive Systems	1	1.1	1.1	85.4
	Design and Release Engineer at Ford Motor Company. Resposible for rlease of glass runs (TPV rubber extrusions with molded corners) B Pillar Exterior Appliques (2 shot injection molded PMM and ASA) . Inner and outer belt moldings (2 shot PP and TVP for the outer and extruded EPDM inner with flocking) Door glass and regulator system for hte 2015 F150 .	1	1.1	1.1	86.5
	Did some of all the above except owner	1	1.1	1.1	87.6
	Engineering manager	1	1.1	1.1	88.8
	HSE	1	1.1	1.1	89.9
	I am now the maintenance supervisor for the injection molding department for General Motors in Spring Hill, TN.	1	1.1	1.1	91.0
	I have B.S. in Product Design Engineering Degree from Ferris, and the Plastics A.A.S. and another A. A.S. from Lansing Communtiy College	1	1.1	1.1	92.1
	Process Launch Engineer	1	1.1	1.1	93.3
	Product Design & Development & Program Management	1	1.1	1.1	94.4
	Research and Development	1	1.1	1.1	95.5
	Sales Manager for feed screw design and manufacturing company - Glycon Corporation - Tecumseh, Michigan	1	1.1	1.1	96.6
	Supplier Techinical Assistance	1	1.1	1.1	97.8
	Supply Chain Management	1	1.1	1.1	98.9
	Teacher	1	1.1	1.1	100.0
	Total	89	100.0	100.0	

q10 Job title

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	1.1	1.1	1.1
	Account development manager	1	1.1	1.1	2.2
	Account Manager	4	4.5	4.5	6.7
	Account Manager for Polypropylene Sales	1	1.1	1.1	7.9
	Advanced Design Engineer	1	1.1	1.1	9.0
	Americas Marketing Manager	1	1.1	1.1	10.1
	Applications Engineer	1	1.1	1.1	11.2
	Associate Professor of Marketing and Logistics	1	1.1	1.1	12.4
	Automation Engineer	1	1.1	1.1	13.5
	Business unit director	1	1.1	1.1	14.6
	C0-Owner	1	1.1	1.1	15.7
	Chief Engineer	1	1.1	1.1	16.9
	Chief Engineer, Engineering Section	1	1.1	1.1	18.0
	Corporate Capital and Facilities Engineer	1	1.1	1.1	19.1
	Corporate Quality Lab Technician	1	1.1	1.1	20.2
	Cost Estimator Analyst	1	1.1	1.1	21.3
	Design and Release Engineer	1	1.1	1.1	22.5
	Design Release Engineer	1	1.1	1.1	23.6
	Designer	1	1.1	1.1	24.7
	Director of Manufacturing	1	1.1	1.1	25.8
	Director of Quality	1	1.1	1.1	27.0
	District Sales Manager	1	1.1	1.1	28.1
	Engineer	1	1.1	1.1	29.2
	Engineering Coordinator	1	1.1	1.1	30.3
	Engineering Manager	1	1.1	1.1	31.5
	General Manager	1	1.1	1.1	32.6
	Global Purchasing Director for Thermal Systems	1	1.1	1.1	33.7
	Global Technical Manager	1	1.1	1.1	34.8
	HSE	1	1.1	1.1	36.0
	Injection Molding Process Engineer	1	1.1	1.1	37.1
	Maintenance Group Leader	1	1.1	1.1	38.2
	managing member/President	1	1.1	1.1	39.3
	Manufacturing Engineer	2	2.2	2.2	41.6
	Manufacturing Leader	1	1.1	1.1	42.7
	Market Manager	1	1.1	1.1	43.8
	Mold designer	1	1.1	1.1	44.9
	Molding Manager	1	1.1	1.1	46.1
	Molding Process Engineer	1	1.1	1.1	47.2
	New Product Introduction Engineer	1	1.1	1.1	48.3
	North Americas Regional Raw Materials Manager	1	1.1	1.1	49.4
	OEM Development Manager	1	1.1	1.1	50.6
	plant manager	1	1.1	1.1	51.7
	Plant Supervisor	1	1.1	1.1	52.8
	Plastics Technology Specialist	1	1.1	1.1	53.9
	Process engineer	1	1.1	1.1	55.1
	Process Engineer	2	2.2	2.2	57.3
	Process Engineering Intern	1	1.1	1.1	58.4
	Process Launch Engineer	1	1.1	1.1	59.6
	Product Development Engineer	1	1.1	1.1	60.7
	Product Engineer	1	1.1	1.1	61.8
	Product Support Engineer	1	1.1	1.1	62.9

q10 Job title

		Frequency	Percent	Valid Percent	Cumulative Percent
	Production Manager	1	1.1	1.1	64.0
	Production support engineer	1	1.1	1.1	65.2
	Program Director	1	1.1	1.1	66.3
	Program Engineer	1	1.1	1.1	67.4
	Program Manager	1	1.1	1.1	68.5
	Program Manager/Project Engineer	1	1.1	1.1	69.7
	Program Supplier Technical Assistant	1	1.1	1.1	70.8
	project engineer	1	1.1	1.1	71.9
	Project Engineer	1	1.1	1.1	73.0
	Project Engineer, CPM	1	1.1	1.1	74.2
	Project Manager	1	1.1	1.1	75.3
	Project Manager Solution Development	1	1.1	1.1	76.4
	Quality Engineer	1	1.1	1.1	77.5
	R&D Process Technician	1	1.1	1.1	78.7
	Sales and Purchasing Representative	1	1.1	1.1	79.8
	Sales Director	1	1.1	1.1	80.9
	Sales Manager	1	1.1	1.1	82.0
	Senior Design Engineer	1	1.1	1.1	83.1
	Senior Manufacturing Engineer...aka Design Leader-Casting and Tooling	1	1.1	1.1	84.3
	Senior Molding Engineer	1	1.1	1.1	85.4
	Senior Process Engineer	2	2.2	2.2	87.6
	Senior Product Development Engineer	1	1.1	1.1	88.8
	Senior Program Manager	1	1.1	1.1	89.9
	Survey Department Head	1	1.1	1.1	91.0
	Teacher of Industrial Technology	1	1.1	1.1	92.1
	Technical Sales Associate	1	1.1	1.1	93.3
	Technical Sales Support	1	1.1	1.1	94.4
	Technical Service Manager	1	1.1	1.1	95.5
	Technical Service Specialist	1	1.1	1.1	96.6
	Tooling Engineer	1	1.1	1.1	97.8
	Tooling/Process Engineer	1	1.1	1.1	98.9
	WH / Global Strategic Business Manager	1	1.1	1.1	100.0
	Total	89	100.0	100.0	

q11_1 In-house processes: Injection Molding

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	32	36.0	38.1	38.1
	Selected	52	58.4	61.9	100.0
	Total	84	94.4	100.0	
Missing	System	5	5.6		
Total		89	100.0		

q11_2 In-house processes: Compression Molding

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	72	80.9	85.7	85.7
	Selected	12	13.5	14.3	100.0
	Total	84	94.4	100.0	
Missing	System	5	5.6		
Total		89	100.0		

q11_3 In-house processes: Transfer Molding

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	80	89.9	95.2	95.2
	Selected	4	4.5	4.8	100.0
	Total	84	94.4	100.0	
Missing	System	5	5.6		
Total		89	100.0		

q11_4 In-house processes: Thermoforming

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	75	84.3	89.3	89.3
	Selected	9	10.1	10.7	100.0
	Total	84	94.4	100.0	
Missing	System	5	5.6		
Total		89	100.0		

q11_5 In-house processes: RIM

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	79	88.8	94.0	94.0
	Selected	5	5.6	6.0	100.0
	Total	84	94.4	100.0	
Missing	System	5	5.6		
Total		89	100.0		

q11_6 In-house processes: Blow Molding

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	76	85.4	90.5	90.5
	Selected	8	9.0	9.5	100.0
	Total	84	94.4	100.0	
Missing	System	5	5.6		
Total		89	100.0		

q11_7 In-house processes: Extrusion

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	66	74.2	78.6	78.6
	Selected	18	20.2	21.4	100.0
	Total	84	94.4	100.0	
Missing	System	5	5.6		
Total		89	100.0		

q11_8 In-house processes: Composites

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	79	88.8	94.0	94.0
	Selected	5	5.6	6.0	100.0
	Total	84	94.4	100.0	
Missing	System	5	5.6		
Total		89	100.0		

q11_9 In-house processes: Decorating/Finishing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	57	64.0	67.9	67.9
	Selected	27	30.3	32.1	100.0
	Total	84	94.4	100.0	
Missing	System	5	5.6		
Total		89	100.0		

q11_10 In-house processes: Assembly

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	49	55.1	58.3	58.3
	Selected	35	39.3	41.7	100.0
	Total	84	94.4	100.0	
Missing	System	5	5.6		
Total		89	100.0		

q11_11 In-house processes: Other

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	51	57.3	60.7	60.7
	Selected	33	37.1	39.3	100.0
	Total	84	94.4	100.0	
Missing	System	5	5.6		
Total		89	100.0		

q11a Other specified

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		46	51.7	51.7	51.7
	Automotive Fascia Injection Molding	1	1.1	1.1	52.8
	Blending/Mixing	1	1.1	1.1	53.9
	Both thermoplastic and thermoset injection molding.	1	1.1	1.1	55.1
	Casting	1	1.1	1.1	56.2
	Chemicals - Downstream	1	1.1	1.1	57.3
	Compounding	1	1.1	1.1	58.4
	Currently working with interior automotive suppliers.	1	1.1	1.1	59.6
	Custom compounding - Resin Manufacturer	1	1.1	1.1	60.7
	Cut and Sew	1	1.1	1.1	61.8
	Exporting, Warehousing, Trucking, Q.A. (testing, MI, Density, Impact)	1	1.1	1.1	62.9
	Feed screw manufacturing for all plastic processes	1	1.1	1.1	64.0
	Ford assemlbies automobiles. Our suppliers do all of the plastics and rubber manufacturing.	1	1.1	1.1	65.2
	Ford Motor Company	1	1.1	1.1	66.3
	Hot Runners	1	1.1	1.1	67.4
	I work at the corporate office. The company itself has injection molding, ISBM, extrusion blow molding, and many different downstream processes	1	1.1	1.1	68.5
	Injection Molding, Painting, and Chrome Plating	1	1.1	1.1	69.7
	LSR molding	1	1.1	1.1	70.8
	Material Supplier	1	1.1	1.1	71.9
	metal working	1	1.1	1.1	73.0
	My company does the main design of our product, on site we have materials test labs, electrical test labs (including EMC), acustic test labs, a full prototyping machine shop (including SLA as well as other 3D part manufacturing equipment), and limited run production of injection molding (usually only for development purposes). The majority of our assembly and parts production is done in China.	1	1.1	1.1	74.2
	N/A	1	1.1	1.1	75.3
	none	2	2.2	2.2	77.5
	None	2	2.2	2.2	79.8
	None of the above.	1	1.1	1.1	80.9
	None, we process stainless steel	1	1.1	1.1	82.0
	Not working in the Plastics Industry	1	1.1	1.1	83.1
	Plastic Food packaging containers	1	1.1	1.1	84.3
	Polymerization, compounding	1	1.1	1.1	85.4
	Professional sales organization	1	1.1	1.1	86.5
	resin manufacturer	1	1.1	1.1	87.6
	Resin manufacturer - compounding and polymerization	1	1.1	1.1	88.8
	Rubber mixing	1	1.1	1.1	89.9
	Rubber Mixing	1	1.1	1.1	91.0
	The customers I visit have all of the above. As a sales woman, I represent a plastic distribution company that supplies resin to all kinds of molders.	1	1.1	1.1	92.1
	Tooling for injection molding	1	1.1	1.1	93.3
	University has the instructional capabilities listed above.	1	1.1	1.1	94.4

q11a Other specified

		Frequency	Percent	Valid Percent	Cumulative Percent
	Use to do Lost Foam.....to Create Heads and Block for GM Powertrain.	1	1.1	1.1	95.5
	Vac forming	1	1.1	1.1	96.6
	Vaccum forming, topcoat press transfer	1	1.1	1.1	97.8
	We are a resin distributor with no manufacturing.	1	1.1	1.1	98.9
	We currently outsource all programs but are waiting on funding to venture into manufacturing.	1	1.1	1.1	100.0
	Total	89	100.0	100.0	

q12 In what country do you work

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	North America	1	1.1	1.1	1.1
	Switzerland / United States	1	1.1	1.1	2.2
	Tecumseh Michigan USA	1	1.1	1.1	3.4
	U.S.	3	3.4	3.4	6.7
	United states	1	1.1	1.1	7.9
	United States	11	12.4	12.4	20.2
	United States of America	2	2.2	2.2	22.5
	US	13	14.6	14.6	37.1
	usa	3	3.4	3.4	40.4
	Usa	1	1.1	1.1	41.6
	USA	52	58.4	58.4	100.0
	Total	89	100.0	100.0	

q13 In what state do you work

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Arizona	1	1.1	1.1	1.1
	AZ	2	2.2	2.2	3.4
	California	1	1.1	1.1	4.5
	East Coast	1	1.1	1.1	5.6
	Florida	2	2.2	2.2	7.9
	il	1	1.1	1.1	9.0
	IL	4	4.5	4.5	13.5
	Illinios	1	1.1	1.1	14.6
	Illinois	1	1.1	1.1	15.7
	Kentucky	2	2.2	2.2	18.0
	Live in Michigan, travel throughout US for job	1	1.1	1.1	19.1
	MI	10	11.2	11.2	30.3
	MI MO IL	1	1.1	1.1	31.5
	michigan	1	1.1	1.1	32.6
	Michigan	46	51.7	51.7	84.3
	Ohio	4	4.5	4.5	88.8
	OHIO	1	1.1	1.1	89.9
	Ohio, Michigan, Pa., IN, Ky,	1	1.1	1.1	91.0
	South Carolina	1	1.1	1.1	92.1
	Tennessee	1	1.1	1.1	93.3
	Texas	1	1.1	1.1	94.4
	TX	1	1.1	1.1	95.5
	Utah	1	1.1	1.1	96.6
	Virginia	1	1.1	1.1	97.8
	Wisconsin	1	1.1	1.1	98.9
	Work in Michigan Company in California	1	1.1	1.1	100.0
	Total	89	100.0	100.0	

q14 Satisfied with career choice

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	9	10.1	10.1	10.1
	Satisfied	80	89.9	89.9	100.0
	Total	89	100.0	100.0	

q15 Perceive opportunities for career growth in industry

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	3	3.4	3.4	3.4
	Average	39	43.8	44.3	47.7
	Excellent	46	51.7	52.3	100.0
	Total	88	98.9	100.0	
Missing	System	1	1.1		
Total		89	100.0		

q16 Perceive opportunities for lateral movement in industry

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	1	1.1	1.1	1.1
	Average	31	34.8	35.2	36.4
	Excellent	56	62.9	63.6	100.0
	Total	88	98.9	100.0	
Missing	System	1	1.1		
Total		89	100.0		

q17 How prepared for first job in industry

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Unprepared	3	3.4	3.4	3.4
	Adequately prepared	33	37.1	37.1	40.4
	Well prepared	53	59.6	59.6	100.0
	Total	89	100.0	100.0	

q18 How valuable were internships

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Useless	4	4.5	4.6	4.6
	Necessary	24	27.0	27.6	32.2
	Vital	59	66.3	67.8	100.0
	Total	87	97.8	100.0	
Missing	System	2	2.2		
Total		89	100.0		

q19 How valuable were lab experiences

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Useless	1	1.1	1.1	1.1
	Necessary	21	23.6	24.1	25.3
	Vital	65	73.0	74.7	100.0
	Total	87	97.8	100.0	
Missing	System	2	2.2		
Total		89	100.0		

q20a Opinion of lab density

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Sparse	3	3.4	3.4	3.4
	Adequate	82	92.1	92.1	95.5
	Crowded	4	4.5	4.5	100.0
	Total	89	100.0	100.0	

q20b Opinion of classroom density

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Sparse	2	2.2	2.2	2.2
	Adequate	86	96.6	96.6	98.9
	Crowded	1	1.1	1.1	100.0
	Total	89	100.0	100.0	

q21a Quality of instruction received in courses

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Inadequate	2	2.2	2.2	2.2
	Adequate	25	28.1	28.1	30.3
	Excellent	62	69.7	69.7	100.0
	Total	89	100.0	100.0	

q21b The teaching expertise of the faculty in general

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Inadequate	1	1.1	1.1	1.1
	Adequate	28	31.5	31.5	32.6
	Excellent	60	67.4	67.4	100.0
	Total	89	100.0	100.0	

q21c The lab equipment in the processing labs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Inadequate	3	3.4	3.4	3.4
	Adequate	56	62.9	62.9	66.3
	Excellent	30	33.7	33.7	100.0
	Total	89	100.0	100.0	

q21d The lab equipment in the testing labs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Inadequate	4	4.5	4.5	4.5
	Adequate	58	65.2	65.2	69.7
	Excellent	27	30.3	30.3	100.0
	Total	89	100.0	100.0	

q21e The lab equipment in the mold design labs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Inadequate	15	16.9	16.9	16.9
	Adequate	58	65.2	65.2	82.0
	Excellent	16	18.0	18.0	100.0
	Total	89	100.0	100.0	

q22a Injection Molding Processing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Lacking	4	4.5	4.6	4.6
	Adequate	67	75.3	77.0	81.6
	Excessive	16	18.0	18.4	100.0
	Total	87	97.8	100.0	
Missing	System	2	2.2		
Total		89	100.0		

q22b Extrusion Molding Processing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Lacking	20	22.5	23.0	23.0
	Adequate	63	70.8	72.4	95.4
	Excessive	4	4.5	4.6	100.0
	Total	87	97.8	100.0	
Missing	System	2	2.2		
Total		89	100.0		

q22c Thermoforming Processes

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Lacking	8	9.0	9.2	9.2
	Adequate	73	82.0	83.9	93.1
	Excessive	6	6.7	6.9	100.0
	Total	87	97.8	100.0	
Missing	System	2	2.2		
Total		89	100.0		

q22d Blow Molding Processes

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Lacking	12	13.5	13.8	13.8
	Adequate	68	76.4	78.2	92.0
	Excessive	7	7.9	8.0	100.0
	Total	87	97.8	100.0	
Missing	System	2	2.2		
Total		89	100.0		

q22e Composites

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Lacking	35	39.3	40.2	40.2
	Adequate	46	51.7	52.9	93.1
	Excessive	6	6.7	6.9	100.0
	Total	87	97.8	100.0	
Missing	System	2	2.2		
Total		89	100.0		

q22f Physical Properties of Polymers

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Lacking	12	13.5	13.8	13.8
	Adequate	67	75.3	77.0	90.8
	Excessive	8	9.0	9.2	100.0
	Total	87	97.8	100.0	
Missing	System	2	2.2		
Total		89	100.0		

q22g Mold Design

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Lacking	32	36.0	36.8	36.8
	Adequate	53	59.6	60.9	97.7
	Excessive	2	2.2	2.3	100.0
	Total	87	97.8	100.0	
Missing	System	2	2.2		
Total		89	100.0		

q22h Part Design

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Lacking	34	38.2	39.1	39.1
	Adequate	49	55.1	56.3	95.4
	Excessive	4	4.5	4.6	100.0
	Total	87	97.8	100.0	
Missing	System	2	2.2		
Total		89	100.0		

q22i Decoration and Assembly

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Lacking	20	22.5	23.0	23.0
	Adequate	64	71.9	73.6	96.6
	Excessive	3	3.4	3.4	100.0
	Total	87	97.8	100.0	
Missing	System	2	2.2		
Total		89	100.0		

q22j Project Management

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Lacking	49	55.1	56.3	56.3
	Adequate	36	40.4	41.4	97.7
	Excessive	2	2.2	2.3	100.0
	Total	87	97.8	100.0	
Missing	System	2	2.2		
Total		89	100.0		

q22k Materials

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Lacking	20	22.5	23.0	23.0
	Adequate	62	69.7	71.3	94.3
	Excessive	5	5.6	5.7	100.0
	Total	87	97.8	100.0	
Missing	System	2	2.2		
Total		89	100.0		

q22l Automation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Lacking	65	73.0	74.7	74.7
	Adequate	21	23.6	24.1	98.9
	Excessive	1	1.1	1.1	100.0
	Total	87	97.8	100.0	
Missing	System	2	2.2		
Total		89	100.0		

q23 Pursue offering online technical courses

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	52	58.4	58.4	58.4
	No	37	41.6	41.6	100.0
	Total	89	100.0	100.0	

q24 Courses feel missing from curriculum

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		17	19.1	19.1	19.1
	- more classes on part design - specifics to welding/bonding of parts/materials	1	1.1	1.1	20.2
	- More in depth on overall business side of plastics - Automation/EOT	1	1.1	1.1	21.3
	-Safety (OSHA), life critical rules (elevated work, electrical, fire, HAZCOM) -Management (How to manage people and personality conflicts) -Compounding (twin screw extruder with a side feeder or a FCM would be a great learning tool.	1	1.1	1.1	22.5
	3D CAD, additional statistics. Giving the option for to take additional classes to obtain an accredited Engineering degree would open additional options upon graduation.	1	1.1	1.1	23.6
	A junior or senior level semester long class that encompasses a full product life cycle. Starts with designing a part and material selection. Moves into tool build, timeline development, creating a test plan, etc. Continues with new mold trials, developing a robust process and testing for the specific part that was designed.	1	1.1	1.1	24.7
	A stronger program management course.	1	1.1	1.1	25.8
	At the time I graduated, there was not enough curriculum relating to automation and robots. Within the injection molding industry, there is more focus on value added molding processes such as in-mold film, low pressure molding, and insert molding. I would have like to have more injection mold design concepts presented as well.	1	1.1	1.1	27.0
	At the time you did not offer robotics, but you do now.	1	1.1	1.1	28.1
	Automation and tool design.	1	1.1	1.1	29.2
	Automation Composites	1	1.1	1.1	30.3

q24 Courses feel missing from curriculum

		Frequency	Percent	Valid Percent	Cumulative Percent
	Automation using robots popular in the plastics industry. Current automation classes should include Labview training. Project management (how employers and customers expect a project to be managed). While not missing, at the time the mold design class was inadequate.	1	1.1	1.1	31.5
	Automation, robots, plc programming, sensors and vision systems, packaging,	1	1.1	1.1	32.6
	Automation/Robotics	1	1.1	1.1	33.7
	Business basics	1	1.1	1.1	34.8
	Business classes, project management, sustainability, ROI, Balance sheets and cash flow.	1	1.1	1.1	36.0
	Business, finance	1	1.1	1.1	37.1
	Design for manufacturability, additional statisitics as it applies to DOE's and manufacturing, incorporate the stat's in the testing classes.	1	1.1	1.1	38.2
	During my time a Ferris we only discussed blow molding, it could have helped to actualy have a lab for it. Also, more time needed to be spent on part design and materials within the part design.	1	1.1	1.1	39.3
	Ferris needs a class on automotive product development. Others items that would be great to cover are graining of molds, EDM, mold finishes in general, hot runners, and hot runner controllers.	1	1.1	1.1	40.4
	Hands on experience with Hot Runner systems Robotics/Automation	1	1.1	1.1	41.6
	I believe that we need actual machine tool classes.	1	1.1	1.1	42.7
	I think more in depth mold design should be covered. Specifically preferred materials the components should be made from.	1	1.1	1.1	43.8
	I wish we would have covered more in manufacturing, since a lot of my job has to do with what happens after molding/decorating including handling, assembly, etc.	1	1.1	1.1	44.9
	I would add more mold design and part design. Tooling is so critical and knowledge of tooling is generally lacking in the industry. Part design and tool design are so closely linked they should receive more emphasis.	1	1.1	1.1	46.1
	I would have benefited from more exposure to chemistry and material science, more 3D CAD lessons and tooling design work. I was lacking on the fundamentals of mold design and reading/interpreting mold designs.	1	1.1	1.1	47.2
	introduction to mold making, taking a current part and changing it simulating Engineering changes, GD&T intorduction	1	1.1	1.1	48.3
	Lack of time spent to learn robot programming and/or tooling used on robots(end of arm tooling).	1	1.1	1.1	49.4

q24 Courses feel missing from curriculum

		Frequency	Percent	Valid Percent	Cumulative Percent
	Largest learning curve I had going into my position in industry (automotive industry) was tool design principles, especially on a large scale. I would offer a more in depth mold design class. Topics in this class should include mold locating devices (locks, die liners); hot runner design; match inserts and the benefits; angled lifters; straight lifters; core pins; return pins; spring loaded actions etc. Once all these items are covered I suggest Ferris work with automotive partners to show molds on a large scale (I would see if you could obtain a 3D mold design from a past program to review in the class vs a small mold) Issue I faced was we really only covered small basic mold design, not intricate design of large automotive parts with clips/snap features/etc. Also I would contact a company like Synventive to see if they could send in a tech sales rep to conduct a presentation on automotive hot runner systems.	1	1.1	1.1	50.6
	Lean manufacturing, six sigma, excel and scientific problem solving versus trial and error with tribal knowledge.	1	1.1	1.1	51.7
	Less time with Chemistry need more time with program management if the student does want to spend time on the production floor in their career. Robotics is something to know and the student can use no matter what career choice they make. Injection Molding is the largest industry for plastics. We never covering decorating of plastics or assembly. Need more field trips to see what industry options there are.	1	1.1	1.1	52.8
	Management- Setting budgets, doing purchasing, overseeing employees, etc. Safety- A lot of lab safety was covered, but more industry safety would be beneficial.	1	1.1	1.1	53.9
	Marketing, Human Resources, Enviromental	1	1.1	1.1	55.1
	Marketing/Sales	1	1.1	1.1	56.2
	Maybe implement project engineering/management in the class while expanding on assemblies of plastics products	1	1.1	1.1	57.3
	Mechanical Inspection of parts	1	1.1	1.1	58.4
	More design courses would have been helpful - not just Statics & Strengths of Materials - but true design of parts that identify why parts fail and why parts meet design needs/stresses. It would have also been quite helpful to have some welding technologies/skills. Since a major portion of forming plastics/elastomers is forming through metal dies, welding technologies are used frequently.	1	1.1	1.1	59.6
	More field trips to see what industry and processes there really are	1	1.1	1.1	60.7
	More in-depth courses on part design process and project management. Also, more classes on various forming techniques that delved further into each process. More classes on material selection (based on material properties and general usage qualifiers, comparative costs, etc.).	1	1.1	1.1	61.8

q24 Courses feel missing from curriculum

	Frequency	Percent	Valid Percent	Cumulative Percent
More mold design and mold making (lathes, mills, EDM machines, CNC, etc...) classes	1	1.1	1.1	62.9
My answers are based on the curriculum in 1978.	1	1.1	1.1	64.0
N/A	1	1.1	1.1	65.2
Need more composite courses as well as a much better project management course.	1	1.1	1.1	66.3
None	1	1.1	1.1	67.4
None at the time.	1	1.1	1.1	68.5
None I can think of.	1	1.1	1.1	69.7
none.	1	1.1	1.1	70.8
Not necessarily missing but: maybe instead of having just one curriculum for PLTS offer specialty areas such as processing, marketing, design, project management, etc. Having it all in one curriculum force the students to take classes they have no interest in. Possibly keep the AAS a more general degree and then create specialty BS degrees.	1	1.1	1.1	71.9
Plant layout & materials flow throughout the plant should be more emphasized in the curriculum. Businesses are focusing on lean principles & no wasted movements of materials, employees, or resources.	1	1.1	1.1	73.0
PRODUCT DESIGN	1	1.1	1.1	74.2
Product moldability	1	1.1	1.1	75.3
Program Management and project cost management	1	1.1	1.1	76.4
Program/Time Management – Understanding and keeping track of complex activities over long periods of time (Automotive design and tooling time lines are generally over multiple years).	1	1.1	1.1	77.5
Project Management courses would of help me at GM. Metal casting and Lost Foam course might of help me at GM More CAE, CAD, CNC, CMM Courses	1	1.1	1.1	78.7
Project Management, Decorating	1	1.1	1.1	79.8
Project Management, Design of Experiments, patent research	1	1.1	1.1	80.9
Promoting better project management skills would have been helpful. Also we learned the processes but did not necessarily get a good view of the overall industrial process itself as from within a manufacturing facility. (how everyone and everything within a factory works together to produce a finished product).	1	1.1	1.1	82.0
Purchasing Sales Marketing Safety	1	1.1	1.1	83.1
Robotics	1	1.1	1.1	84.3
Rubber Product design course needs to be re-evaluated and taught by Guske. Additional (optional) polymer chemistry class to strengthen knowledge about chemistry and how it applies to polymers.	1	1.1	1.1	85.4
Sales/Business courses.	1	1.1	1.1	86.5
Scientific Molding, DOE's and Process Validation	1	1.1	1.1	87.6
Solidworks	1	1.1	1.1	88.8
Statistical data analysis. We took this course through the manufacturing program, but it wasn't emphasized to how much this would be used elsewhere. Also maybe some business courses?	1	1.1	1.1	89.9

q24 Courses feel missing from curriculum

		Frequency	Percent	Valid Percent	Cumulative Percent
	The management portion of the ciriculum was lacking at the time. The focus was more technical based and a buisness and time management section could be benificial.	1	1.1	1.1	91.0
	There were no Automation courses available when I was at FSU. Also I think there should be more mold and part design related courses. I feel if I had those it would have better prepared me for the industry more. I believe there was adequate class and lab time for the injection molding process.	1	1.1	1.1	92.1
	thermodynamics	1	1.1	1.1	93.3
	To complete a semester long project on your own that encompasses 1. Plastic Part Design; Design the Mold; Produce the Parts; Test the Physical Properties; Decorate / Assemble if Necessary; Design Packaging. In parallel....work with the FSU Marketing Curriculum students to provide them with the experience on launching and commercializing the product. Many times, plastics engineers and the marketing work closely together to conceive a product idea; investigate; prototype; test, consumer feedback; adjust design if necessary; and eventually go to market.	1	1.1	1.1	94.4
	Weakest area for me was complex mold design.	1	1.1	1.1	95.5
	well balance program	1	1.1	1.1	96.6
	Well balanced curriculum, can only fit so much information in period of time. Possibly could have areas on concentration but overall i am please with the program, university and its personnel!	1	1.1	1.1	97.8
	Well rounded curriculum	1	1.1	1.1	98.9
	When I was there automation / robotics was not a part of the program. This is a major part of molding now in the US. The Chemistry taught as a gen ed was not as useful as a focused plastics class would be. It did not prepare us well for organic polymer chemistry. Another useful class would be teaching some of the real world systems students will encounter like ISO9000, TS16949, 5S, TPS, PPAP, APQP, 8D's and so on.	1	1.1	1.1	100.0
	Total	89	100.0	100.0	

q25 Additional comments

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		58	65.2	65.2	65.2
	Business Law would be helpful - contracts, vocabulary, examples, etc. (not just the basic Law). I realize there are limitations based on the fundamentals of the academic requirements within Ferris, but some of the Humanities-style classes were too much. They didn't add to my knowledge or cultural expression. Teaching some of the Six Sigma/Lean info is very important and should be added to the engineering statistics programs. Having a female role model in the faculty or admin would be most helpful. The program could be enhanced by having more diversity in every way.	1	1.1	1.1	66.3
	Communication is the single greatest personal development tool anyone can receive at an institution of higher learning, it is without a doubt the single reason for success or failure of an individuals career.	1	1.1	1.1	67.4
	Consider offering an online certificate program (or for-credit courses) developed and run by faculty at Big Rapids campus (not 100% Grand Rapids) that provides an introduction to materials, processes, basic mold and/or part design, and quality/project management, for example, that can help educate and train shop floor personnel who work or would like to work in a plastics environment and prepare individuals for a technical supervisory role. This could help build additional program awareness and possibly provide the Department an additional source of revenue.	1	1.1	1.1	68.5
	Current students should be well versed in Autodesk Moldflow Insight, Part and Tool design, and Scientific molding principles with cavity pressure monitoring experience and understanding	1	1.1	1.1	69.7
	Ferris has developed a very good program over the years since I graduated in 1973. When I graduated the industry was starting to grow and expand. Employers did not know what to do with Ferris Grad's because there was only one other plastics degree available then.	1	1.1	1.1	70.8
	Ferris' role as a "hands-on" technical university and the plastics program in particular were a great match for my personality and learning style. I am grateful for the education I received from Ferris State University. It has opened many doors.	1	1.1	1.1	71.9
	Hot runner design and technology could be covered better. Troubleshooting of common injection molding defects could be covered better. Liquid color technology is improving and provides a considerable cost savings.	1	1.1	1.1	73.0
	I don't feel I can answer Q22 due to lack of clarity of the question. I would really enjoy some refresher courses that I could come back to Ferris and take in subjects such as injection mold design or processing. I believe more emphasis in the program has been put into learning a 3D software as well and that is a useful tool. Overall I have found my education to be very versatile and useful.	1	1.1	1.1	74.2

q25 Additional comments

		Frequency	Percent	Valid Percent	Cumulative Percent
	I feel that the education I received at Ferris was well rounded enough for me to be very valuable to my employer, not just due to the plastics education, but due to the other areas we were required to learn like electronics, fluid controls, etc.	1	1.1	1.1	75.3
	I feel we were well prepared academically for our transition into the industry, but our class graduated with a lack of jobs. I was confident in my abilities 5 years ago, but I have now settled into a position that doesn't allow me to apply what I learned and now I am feeling stuck. Also, where I work, an engineering degree from MSU seems to be what stands out most on the resumes. I'm not sure if that is just because of the field, packaging, or if there is something lacking from the FSU degree. I feel I am more prepared for the world of production than the recent graduates that they are hiring. I was still overlooked for positions. It could be that I am not good at marketing myself or understanding how to approach the idea of a promotion. This is where I think business courses might help or something in that realm. All this aside, I am very proud of what I was taught at Ferris. I am regularly explaining to others how different systems work (injection molding, blow molding) and I am confident in my ability to explain in lay-men's terms. I am also confident in my ability to pick up on new technology quickly and trouble shoot different situations. I am happy I chose the Plastics degree at FSU. The hands-on training is something no one else really received. They have read and heard about different plastic processes, but, until they are taken to the plant, they have not seen an actual machine...let alone have a basic understanding of how it is set up.	1	1.1	1.1	76.4
	I found the instructors had excellent knowledge and provided excellent guidance. Even with graduating with 2.8, I was able to get a job in the largest Corporation in the world after two years of working experience. I currently work for ExxonMobil and have 20 years of service. I have moved my way up to Management after starting as a Technician. I owe my success to the hands on laboratories and internships that allowed me to get my foot in the door. Although ExxonMobil has many areas of research I was able to work directly with plastics, rubbers, and combinations of the two (such as Santoprene). This is where my experience helped me get promoted to a Lab Engineer and now Global Technical Manager.	1	1.1	1.1	77.5
	I graduated over 20 years ago, so the program is well ahead from when I was there. I think the program should also keep Urethanes, processing and materials, as part of thier focus.	1	1.1	1.1	78.7
	I have not worked in the industry for over 14 years. I sought a different career path.	1	1.1	1.1	79.8
	I loved everything about the Plastics program and the Product Design Tech BS Program. I feel that more CAD, CMM, CNC and CAE hands on would of been great... other than that Ferris fit my needs.	1	1.1	1.1	80.9

q25 Additional comments

		Frequency	Percent	Valid Percent	Cumulative Percent
	I was the 2nd group to graduate with AAS in Plastics Tech - that was 1973. So I really cannot comment as to your current facilities, etc.	1	1.1	1.1	82.0
	I was transfer student. So my experience may not be standard as i only took 16 credits at ferris to get my as 2 year degree rest of credits transfered in from community college.	1	1.1	1.1	83.1
	I would be extremely hesitant to move some courses to online. I think if you ask most the people from automotive, when they started allowing online courses the quality of the education decreased.	1	1.1	1.1	84.3
	I've been talking with people at work about some of the classes we sere not required to take at FSU, like calculus. In my almost 20 years of working as an engineer, I have never once needed to know calculus. I have explained to co-workers that we were taught in a practical way, using lots of hands on labs and very relevant classes. This is what separates Ferris from other technical schools, and should be preserved.	1	1.1	1.1	85.4
	Improved mold design principles. 95% of the processing engineers work heavily with mold repair to solve issues such as lifter lines/flash etc. All need to be captured to improv processing technique on the floor.	1	1.1	1.1	86.5
	It is a great program that prepares students for entering the work world in plastics. They are able to hit the ground running. Be sure to keep developing people who can do actual work. People like the design or management desk jobs, but being able to walk on the production floor and get things done is critical. You earn respect because you know what really needs to be done, and you are more valuable because of your diverse skills.	1	1.1	1.1	87.6
	It would be nice to receive a directory of all the Plastic and Rubber Curriculum graduates since its inception (early 70's) to remain in contact with everyone.	1	1.1	1.1	88.8
	My time at FSU at the Plastics Program was an is one of the highlights of my life, would do it again.	1	1.1	1.1	89.9
	Overall I feel that the program did an excellent job in preparing me for a career in the plastics industry. It is evident in talking with companies and recruiters that graduates from the Ferris Plastics program are highly sought after.	1	1.1	1.1	91.0
	Overall very pleased with the program.	1	1.1	1.1	92.1
	Please keep concentrating on hands-on experiences. It is even more important than when I went through. Theory is great, and there is a lot of it on the web, but it can be an entirely different experience to actually use tools and equipment while accomplishing an objective.	1	1.1	1.1	93.3
	The area above where I mentioned Composite and Testing information lacking, may have just been my lack of absorbing the information presented.	1	1.1	1.1	94.4
	The experenice in the lab is hard to simulate with an on line class.	1	1.1	1.1	95.5

q25 Additional comments

		Frequency	Percent	Valid Percent	Cumulative Percent
	The lab time was essential and a great basis to build on for future experience. The internships were critical, but professors should press harder for clear reports of the completed work. Professors were very good at sharing what they knew, many lessons still ring through my mind 14-16 years later. Focusing a bit more on basic chemistry of polymers might have helped, but the polymer chemistry classes we had were very good. Really need to consider adding a tooling design class - 3D CAD is a big part of our world now. International experience would be a good thing to ponder. The product design and project management classes were vital and helpful.	1	1.1	1.1	96.6
	The technical plastics education I received from Ferris has served me well over the years, I have always had a good job. More information dealing with production schedules, raw material flow,(supply stream), tool and die repair, part design would have been helpful.	1	1.1	1.1	97.8
	the trend is moving quickly towards 3D printing being used for rapid prototyping, and also for low volume work. Capital costs are coming down, and utilization is growing. We need to get more than a maker's bot in the lab to keep up.	1	1.1	1.1	98.9
	This current plastics program in not keeping up with technology advances in the equipment Lab area, The Lab needs a major up grade if FSU wants to be the leader in Plastics Technology Education. Your running the a modern Indy 500 race with model A cars....so to speak. This issue needs to be address at the top level...NOT FAIR TO THE PLASTIC'S STUDENT'S who are coming to a technical school thinking they are getting the best technical education. You also need to address a lacking budget to PM the old equipment...we would not be able to run our business and maintain a quality sellable product for our customers if we had no funds to keep our production equipment running...this is true for your lab equipment...YOUR STUDENT's are PRODUCT YOU ARE SELLING.	1	1.1	1.1	100.0
	Total	89	100.0	100.0	

q26 Additional comments cont'd

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		81	91.0	91.0	91.0
	After my time at Ferris, I worked in the trenches for several years, then went on to graduate school where I picked up two Masters and PhD. I am proud to say - FSU Plastics was the best education I received hands down! At Ferris, the faculty not only want you to learn it, they make sure you know it - and they require you to do it to prove it. Thank you!!	1	1.1	1.1	92.1
	As an Plastics advisor, I am very disappointed that the school expects the advisory board to raise the needed $$ to upgrade the lab equipment to tech your growing Plastics Program student's on. We are very busy in a very demanding /growing industry to have to be fund raisers for the university. The university NEED's to address this lack of funding issue in an effort to keep the FSU plastics program to be the BEST plastic degreed technical training in Michigan. With the right tools, education and a "can do anything" mind set you can achieve great things! I am a proud AAS FSU plastics grad making a 6 figure income and love coming to work every day. I am thankful for the high quality education I received from FSU back in 1981! The PLASTICS industry has been very, very good to me. It has truly been full of Imagination and Innovation over the past 32 years!	1	1.1	1.1	93.3
	Having a Masters or even a PhD program would be a significant compliment to the Program. I believe this has been discussed for quite a while - I hope that you can make a decision on this quickly because I believe that this deters some students from entering the program since they may think that they have to get another advanced degree somewhere else (which could take longer).	1	1.1	1.1	94.4
	I can see graduates getting jobs as technicians but a lot of this work is getting outsourced or contracted out.	1	1.1	1.1	95.5
	I hope we can be copied on the final survey assessment.	1	1.1	1.1	96.6
	Later lab class run the lab like a manufacturing plant. Have simluated quota's and change overs and a daily production report as the assignment. Have a new "production supervisor" every week to be in charge of the lab and be responsible to meet the requirments of the instructor who acts as plant manager.	1	1.1	1.1	97.8

q26 Additional comments cont'd

		Frequency	Percent	Valid Percent	Cumulative Percent
	One improvement the program could make is a focused class to train molding technicians for simple mold setting, job setup, simple troubleshooting skills as well as some limited background to what plastics are. Also, classes that are technology refreshers for people in the industry could be helpful. These would be something an employer would send people to.	1	1.1	1.1	98.9
	The best thing is that I was not a strong student in High School. I didn't score high on my act. I think High School I had a 2.7 gpa and scored a 17 on the ACT. I work at General Motors and Probably one of the highest paid guy in my dept. If I would of had to take a program at a U of M or MSU, it would of been way to hard for me to become an engineer. remember K.I.S.S rule-Keep It Simple- because both the Plastics and Product Engineering program was perfect for me.	1	1.1	1.1	100.0
	Total	89	100.0	100.0	

Section 2A

Summary Survey

Alumni Survey Summary

Disclaimer: Out of about 2000 Plastics and Rubber program alumni, only 943 email addresses were on file. However many of those addresses were alternates for the same individual leaving an estimated 300 distinct alumni attempted contacts. Of those ~300 alumni only 89 responded to this APR alumni survey of which 83 were plastics program alumni or about 4% of the total alumni. 20 of those alumni are no longer working in the industry however 3 are teaching in plastics.

Also it important to realize that the graduate respondents were distributed from across the years spanning 1973 to present. This is significant in that some issues appearing in the survey, notably in the comments section, have since been addressed after their graduation.

Strong survey response indicators that are consistent with program goals:

62% of the respondents are involved in injection molding with 65% involved with all the other processes. Obviously there is some overlap.

96% of respondents perceive opportunities for career growth as well as lateral movement within the plastics industry

96% felt the plastics programs prepared them well for their first job

95% deemed the internship experience as a valuable component to their educational experience

No one responded as "dissatisfied" with their career choice

All but one individual felt the laboratory experience was necessary with 75% going so far as to rate it as "vital"

Only two individuals rated quality of instruction as "Inadequate"

Strong survey response indicators suggesting action:

With respect to curriculum, over half felt Project Management was lacking from the curriculum, 75% felt Automation was lacking, and about a third also noted Part and Mold Design wasn't enough and 40% felt Composites was not dealt with enough.

Every one of the 89 respondents added a remark in the comments section. A brief summary these re-iterates the need for automation/robotics, more mold and part design, product management, marketing and business courses,

Ferris State University

Plastics and Rubber Engineering Technology Academic program review

Employer In put

a. Survey
b. Survey results
c. Summery
d. Conclusions

PLTE APR Frequencies...Employers

Prepared by: Institutional Research & Testing, 08/14

Statistics

	N				
	Valid	Missing	Mean	Median	Std. Deviation
q1 Which grads traditionally employ	24	0	1.21	1.00	.588
q2 Which best reflects company's hiring	24	0	2.79	3.00	.588
q3 HIred (full time) grad from Plastics/Rubber	23	1	1.52	1.00	1.082
q4 How many grads employed in company	23	1	2.30	2.00	1.063
q5 Comments regarding any of above	24	0			
q6 Overall level of satisfactions w/ grads	23	1	3.78	4.00	.795
q7 Overall assessment of technical prep	23	1	3.87	4.00	.869
q8 Comments regarding any of above	24	0			
q9 Ever visited Plastics/Rubber programs	23	1	1.39	1.00	.499
q10 Hire Plastics/Rubber grads in future	23	1	1.09	1.00	.288
q11a Processing	24	0	3.83	4.00	.637
q11b Design	24	0	3.13	3.00	.850
q11c Composites	24	0	2.58	2.50	1.018
q11d Materials	24	0	3.67	4.00	.761
q11e Decorating & Assembly	24	0	2.71	3.00	.751
q11f Ancillary Equipment	24	0	3.46	3.00	.779
q11g Rubber	23	1	2.30	2.00	1.063
q11h Compounding	24	0	2.58	2.50	1.176
q11i Elastomers	24	0	3.13	3.00	1.035
q11j Other	6	18	3.67	4.00	1.506
q11k Please Specify:	24	0			

q12a Need for Plastics/Rubber grads will	24	0	2.75	3.00	.442
q12b Need for Plastics/Rubber grads in 100 mile radius will	23	1	3.00	3.00	.522
q13 2-3 most important personal attributes	24	0			
q14 2-3 most important technical skills	24	0			
q15 Hired (full time) summer intern from Plastics/Rubber	23	1	1.39	1.00	.941
q16 How many interns employed in company in last 2 yrs	23	1	2.26	2.00	1.096
q17_1 Intern skills set: Communication	24	0	.92	1.00	.282
q17_2 Intern skills set: Problem solving	24	0	.96	1.00	.204
q17_3 Intern skills set: Processing	24	0	.88	1.00	.338
q17_4 Intern skills set: Design	24	0	.38	.00	.495
q17_5 Intern skills set: Materials knowledge	24	0	.75	1.00	.442
q17_6 Intern skills set: Compounding	24	0	.17	.00	.381
q17_7 Intern skills set: Testing	24	0	.29	.00	.464
q17_8 Intern skills set: Other	24	0	.08	.00	.282
q17a Other specified	24	0			
q18a Communication	24	0	3.50	4.00	.834
q18b Problem solving	24	0	3.50	4.00	.834
q18c Processing	23	1	3.83	4.00	.834
q18d Design	23	1	3.70	4.00	1.020
q18e Materials knowledge	24	0	3.71	4.00	.859
q18f Compounding	23	1	4.04	4.00	1.022
q18g Testing	24	0	3.79	4.00	.932
q18h Other	6	18	4.33	5.00	1.211
q18i Other specified	24	0			
q19 Plastics/Rubber interns are valuable to my company	24	0	2.75	3.00	.532
q20 Company's perception of next 5 yrs, need for interns	24	0	2.58	3.00	.504
q21 Additional comments/suggestions	24	0			

Frequency Table

q1 Which grads traditionally employ

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Plastics Engineering Technology	21	87.5	87.5	87.5
	Rubber Engineering Technology	1	4.2	4.2	91.7
	Both	2	8.3	8.3	100.0
	Total	24	100.0	100.0	

q2 Which best reflects company's hiring

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Only interns	2	8.3	8.3	8.3
	Only full-time employees	1	4.2	4.2	12.5
	Both	21	87.5	87.5	100.0
	Total	24	100.0	100.0	

q3 Hired (full time) grad from Plastics/Rubber

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Plastics	18	75.0	78.3	78.3
	Rubber	1	4.2	4.3	82.6
	Both	1	4.2	4.3	87.0
	I don't know	3	12.5	13.0	100.0
	Total	23	95.8	100.0	
Missing	System	1	4.2		
Total		24	100.0		

q4 How many grads employed in company

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	6	25.0	26.1	26.1
	2-4	8	33.3	34.8	60.9
	5 or more	5	20.8	21.7	82.6
	I don't know	4	16.7	17.4	100.0
	Total	23	95.8	100.0	

Missing	System	1	4.2		
Total		24	100.0		

q5 Comments regarding any of above

		Frequency	Percent	Valid Percent
Valid		15	62.5	62.5
	Becton Dickinson does not seem to be on the radar for most Ferris State graduates. It is rare to see a resume from a Ferris State grad in the SC location.	1	4.2	4.2
	First time we have hired an intern from the Plastics Program.	1	4.2	4.2
	N/A	1	4.2	4.2
	The one individual is an alumni who has been out many years.	1	4.2	4.2
	This is SMRs first year in bringing on an intern / Co-op through Ferris State. We have not hired any graduates through the program yet, we would like to continue bringing interns on board.	1	4.2	4.2
	Very good fit at Fleet Engineers	1	4.2	4.2
	We currently have 1 Ferris grad but he graduated long ago...	1	4.2	4.2
	We currently have 2 Interns from Ferris State. We are very pleased with them both. We are making an offer to the senior and bringing back the other student for another internship next summer.	1	4.2	4.2
	We currently only have 1 intern from your program. We are willing to consider others as interns or full time hires.	1	4.2	4.2
	Total	24	100.0	100.0

q5 Comments regarding any of above

		Cumulative Percent
Valid		62.5
	Becton Dickinson does not seem to be on the radar for most Ferris State graduates. It is rare to see a resume from a Ferris State grad in the SC location.	66.7
	First time we have hired an intern from the Plastics Program.	70.8

	N/A	75.0
	The one individual is an alumni who has been out many years.	79.2
	This is SMRs first year in bringing on an intern / Co-op through Ferris State. We have not hired any graduates through the program yet, we would like to continue bringing interns on board.	83.3
	Very good fit at Fleet Engineers	87.5
	We currently have 1 Ferris grad but he graduated long ago...	91.7
	We currently have 2 Interns from Ferris State. We are very pleased with them both. We are making an offer to the senior and bringing back the other student for another internship next summer.	95.8
	We currently only have 1 intern from your program. We are willing to consider others as interns or full time hires.	100.0
	Total	

q6 Overall level of satisfactions w/ grads

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Dissatisfied	1	4.2	4.3	4.3
	Somewhat Dissatisfied	1	4.2	4.3	8.7
	Somewhat Satisfied	1	4.2	4.3	13.0
	Very Satisfied	19	79.2	82.6	95.7
	I don't know	1	4.2	4.3	100.0
	Total	23	95.8	100.0	
Missing	System	1	4.2		
Total		24	100.0		

q7 Overall assessment of technical prep

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Inadequate	1	4.2	4.3	4.3
	Somewhat Adequate	4	16.7	17.4	21.7
	Very Adequate	14	58.3	60.9	82.6
	I don't know	4	16.7	17.4	100.0
	Total	23	95.8	100.0	
Missing	System	1	4.2		
Total		24	100.0		

q8 Comments regarding any of above

		Frequency	Percent	Valid Percent
Valid		16	66.7	66.7
	As with the other plastics programs there is not enough exposure to extrusion as a science. Grads are well exposed to the injection molding science.	1	4.2	4.2
	Automation is a needed area of focus as well as more theoretical injection molding.	1	4.2	4.2
	Currnetly only exposed to a Freshman regarding technical preparation.	1	4.2	4.2
	I would prefer to answer these questions as not applicable as we have not had the opportunity to employ FSU graduates to date.	1	4.2	4.2
	Intern was very eager to learn in an advanced setting. Technically- Intern was exposed to many complex tooling and processes.	1	4.2	4.2
	N/A	1	4.2	4.2
	Very Well Rounded	1	4.2	4.2
	We have experienced a downward shift over the last several years of the level of motivation, drive, confidence in their technical training, and work ethic of both interns and recent graduates.	1	4.2	4.2
	Total	24	100.0	100.0

q8 Comments regarding any of above

		Cumulative Percent
Valid		66.7
	As with the other plastics programs there is not enough exposure to extrusion as a science. Grads are well exposed to the injection molding science.	70.8
	Automation is a needed area of focus as well as more theoretical injection molding.	75.0
	Currnetly only exposed to a Freshman regarding technical preparation.	79.2
	I would prefer to answer these questions as not applicable as we have not had the opportunity to employ FSU graduates to date.	83.3
	Intern was very eager to learn in an advanced setting. Technically- Intern was exposed to many complex tooling and processes.	87.5

	N/A	91.7
	Very Well Rounded	95.8
	We have experienced a downward shift over the last several years of the level of motivation, drive, confidence in their technical training, and work ethic of both interns and recent graduates.	100.0
	Total	

q9 Ever visited Plastics/Rubber programs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	14	58.3	60.9	60.9
	No	9	37.5	39.1	100.0
	Total	23	95.8	100.0	
Missing	System	1	4.2		
Total		24	100.0		

q10 Hire Plastics/Rubber grads in future

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	21	87.5	91.3	91.3
	Maybe	2	8.3	8.7	100.0
	Total	23	95.8	100.0	
Missing	System	1	4.2		
Total		24	100.0		

q11a Processing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unimportant	1	4.2	4.2	4.2
	Somewhat Important	1	4.2	4.2	8.3
	Very Important	22	91.7	91.7	100.0
	Total	24	100.0	100.0	

q11b Design

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unimportant	2	8.3	8.3	8.3
	Somewhat Unimportant	1	4.2	4.2	12.5
	Somewhat Important	13	54.2	54.2	66.7
	Very Important	8	33.3	33.3	100.0
	Total	24	100.0	100.0	

q11c Composites

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unimportant	3	12.5	12.5	12.5
	Somewhat Unimportant	9	37.5	37.5	50.0
	Somewhat Important	8	33.3	33.3	83.3
	Very Important	3	12.5	12.5	95.8
	Don't Know	1	4.2	4.2	100.0
	Total	24	100.0	100.0	

q11d Materials

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unimportant	1	4.2	4.2	4.2
	Somewhat Unimportant	1	4.2	4.2	8.3
	Somewhat Important	3	12.5	12.5	20.8
	Very Important	19	79.2	79.2	100.0
	Total	24	100.0	100.0	

q11e Decorating & Assembly

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unimportant	2	8.3	8.3	8.3
	Somewhat Unimportant	5	20.8	20.8	29.2
	Somewhat Important	15	62.5	62.5	91.7
	Very Important	2	8.3	8.3	100.0

	Total	24	100.0	100.0	

q11f Ancillary Equipment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Unimportant	2	8.3	8.3	8.3
	Somewhat Important	11	45.8	45.8	54.2
	Very Important	9	37.5	37.5	91.7
	Don't Know	2	8.3	8.3	100.0
	Total	24	100.0	100.0	

q11g Rubber

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unimportant	5	20.8	21.7	21.7
	Somewhat Unimportant	11	45.8	47.8	69.6
	Somewhat Important	2	8.3	8.7	78.3
	Very Important	5	20.8	21.7	100.0
	Total	23	95.8	100.0	
Missing	System	1	4.2		
Total		24	100.0		

q11h Compounding

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unimportant	5	20.8	20.8	20.8
	Somewhat Unimportant	7	29.2	29.2	50.0
	Somewhat Important	6	25.0	25.0	75.0
	Very Important	5	20.8	20.8	95.8
	Don't Know	1	4.2	4.2	100.0
	Total	24	100.0	100.0	

q11i Elastomers

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unimportant	2	8.3	8.3	8.3
	Somewhat Unimportant	4	16.7	16.7	25.0
	Somewhat Important	8	33.3	33.3	58.3
	Very Important	9	37.5	37.5	95.8
	Don't Know	1	4.2	4.2	100.0
	Total	24	100.0	100.0	

q11j Other

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unimportant	1	4.2	16.7	16.7
	Somewhat Important	1	4.2	16.7	33.3
	Very Important	2	8.3	33.3	66.7
	Don't Know	2	8.3	33.3	100.0
	Total	6	25.0	100.0	
Missing	System	18	75.0		
Total		24	100.0		

q11k Please Specify:

		Frequency	Percent	Valid Percent
Valid		20	83.3	83.3
	Hands on experience	1	4.2	4.2
	N/A	1	4.2	4.2
	Project Management / Capital Management	1	4.2	4.2
	Tooling	1	4.2	4.2
	Total	24	100.0	100.0

q11k Please Specify:

		Cumulative Percent
Valid		83.3
	Hands on experience	87.5
	N/A	91.7
	Project Management / Capital Management	95.8

	Tooling	100.0
	Total	

q12a Need for Plastics/Rubber grads will

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	About the Same	6	25.0	25.0	25.0
	Increase	18	75.0	75.0	100.0
	Total	24	100.0	100.0	

q12b Need for Plastics/Rubber grads in 100 mile radius will

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	About the Same	3	12.5	13.0	13.0
	Increase	17	70.8	73.9	87.0
	Don't Know	3	12.5	13.0	100.0
	Total	23	95.8	100.0	
Missing	System	1	4.2		
Total		24	100.0		

q13 2-3 most important personal attributes

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	4.2	4.2	4.2
	-Work ethic -Willingness to work on an off shift for 1-2 yrs. -Ability to relocate	1	4.2	4.2	8.3
	1. Team Player 2. Positive Attitude 3. Self- Confidence	1	4.2	4.2	12.5
	A self starter, hard work ethic, dependable	1	4.2	4.2	16.7
	Ability to think through a problem and solve or at least know where to find information. Know what you don't know.	1	4.2	4.2	20.8
	Analytic focus Increase in mathematical capability (DOE, data driven) Thirst for knowledge	1	4.2	4.2	25.0
	Attention to detail Personal accountability Drive to continuously learn and improve	1	4.2	4.2	29.2

	Better presentation skills and better writing skills are areas that I see needed improvement in all grads. I am also always surprised how unprepared grads are for interviews.	1	4.2	4.2	33.3
	Confidence to apply technical skills that have been learned in the program. Passion for the job and willingness to go the extra step. Increased sense of needing to work hard to move ahead versus the expecation of entitlement from the company.	1	4.2	4.2	37.5
	Drive - ability to take a project and run with it, ask for help if needed. Communication skills - all levels of the organization both verbal and written. Knowing what to communicate, who to communicate to, amount of information and the frequencey Leadership - being able to lead when no one reports to you	1	4.2	4.2	41.7
	Good character, responsible, mature	1	4.2	4.2	45.8
	Good communication, deductive reasoning and time management.	1	4.2	4.2	50.0
	Hands on individual. Cradle to grave projects.	1	4.2	4.2	54.2
	self motivated hard working	1	4.2	4.2	58.3
	Self motivated with a willingness to work.	1	4.2	4.2	62.5
	Self motivation, disciplined and detail oriented.	1	4.2	4.2	66.7
	Team player and good communication skills	1	4.2	4.2	70.8
	Technical skills, good organization skills, as well as good social skills	1	4.2	4.2	75.0
	Thrive to learn and challenge ones' self. Can Do attitude that is unafraid of challenges	1	4.2	4.2	79.2
	time management, communication skills, creativity	1	4.2	4.2	83.3
	Trust worthy, dedicated and tenacious.	1	4.2	4.2	87.5
	We hire salespeople so outside of being technically solid, I need for them to have a extroverted personality: not afraid of talking to people, able to hold conversations, ability to understand what people are looking for.	1	4.2	4.2	91.7
	Willingness to be technically proficient. Personally driven to learn and have a positive attitude.	1	4.2	4.2	95.8
	Work ethic Plastics Knowledge Communication, both verbal and non-verbal	1	4.2	4.2	100.0

	Total	24	100.0	100.0	

q14 2-3 most important technical skills

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		5	20.8	20.8	20.8
	-Processing knowledge -Tooling knowledge - Computer skills	1	4.2	4.2	25.0
	1. Processing 2. Program Management 3. Tooling Knowledge	1	4.2	4.2	29.2
	Ability to work beyond the immediate direction. Curiosity to continue to investigate the next level of the problem, issue or opportunity.	1	4.2	4.2	33.3
	Ability to work beyond the immediate direction. Curiosity to continue to investigate the next level of the problem, issue or opportunity.	1	4.2	4.2	33.3
	Blue print reading, tooling knowledge and processing.	1	4.2	4.2	37.5
	Design for Manufacturing and for lighter weight.	1	4.2	4.2	41.7
	excellent problem solving ability to process and understand polymer behavior	1	4.2	4.2	45.8
	good knowledge of material properties, a good working knowledge of the entire process for making a plastic part, (design to finished part).	1	4.2	4.2	50.0
	Knowledge of injection molding and plastic part design	1	4.2	4.2	54.2
	knowledge of molding plastic(s) - and an understanding of the mechanical aspect of an injection molding machine and the processing of plastic parts.	1	4.2	4.2	58.3
	Knowledge of Thermoforming Knowledge of Injection molding Ability to setup DOE's	1	4.2	4.2	62.5
	Metrology, critical thinking and tool engineering ability.	1	4.2	4.2	66.7
	Plastic process theoretical and hands on knowledge Automation understanding	1	4.2	4.2	70.8

	problem sloving skills, elastomer property knowledge, processing of elastomers	1	4.2	4.2	75.0
	Processing and materials knowledge	1	4.2	4.2	79.2
	Strong technical writing skills Ability to establish a robust process and process window Ability to identify what has changed in the machine/mold if a process change is needed	1	4.2	4.2	83.3
	Technical aptitude to quickly pick up on new skills & information that they may not currently possess. Application of the skills that have been learned.	1	4.2	4.2	87.5
	Tool Design Product Design Process Design	1	4.2	4.2	91.7
	Troubleshooting - systematic way of coming to root cause of an issue. Understanding the why - we often see people know what to do but they don't know why so we don't always get to the real issues.	1	4.2	4.2	95.8
	Willingness to understand and learn processes and equipment. Ability to differntiate between process and tooling issues.	1	4.2	4.2	100.0
	Total	24	100.0	100.0	

q15 Hired (full time) summer intern from Plastics/Rubber

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Plastics	19	79.2	82.6	82.6
	Rubber	1	4.2	4.3	87.0
	Both	1	4.2	4.3	91.3
	I don't know	2	8.3	8.7	100.0
	Total	23	95.8	100.0	
Missing	System	1	4.2		
Total		24	100.0		

q16 How many interns employed in company in last 2 yrs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	7	29.2	30.4	30.4
	2-4	7	29.2	30.4	60.9
	5 or more	5	20.8	21.7	82.6
	I don't know	4	16.7	17.4	100.0
	Total	23	95.8	100.0	
Missing	System	1	4.2		
Total		24	100.0		

q17_1 Intern skills set: Communication

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	2	8.3	8.3	8.3
	Selected	22	91.7	91.7	100.0
	Total	24	100.0	100.0	

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q17_2 Intern skills set: Problem solving

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	1	4.2	4.2	4.2
	Selected	23	95.8	95.8	100.0
	Total	24	100.0	100.0	

q17_3 Intern skills set: Processing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	3	12.5	12.5	12.5
	Selected	21	87.5	87.5	100.0
	Total	24	100.0	100.0	

q17_4 Intern skills set: Design

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	15	62.5	62.5	62.5
	Selected	9	37.5	37.5	100.0
	Total	24	100.0	100.0	

q17_5 Intern skills set: Materials knowledge

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	6	25.0	25.0	25.0
	Selected	18	75.0	75.0	100.0
	Total	24	100.0	100.0	

q17_6 Intern skills set: Compounding

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	20	83.3	83.3	83.3
	Selected	4	16.7	16.7	100.0
	Total	24	100.0	100.0	

q17_7 Intern skills set: Testing

		Frequency	Percent	Valid Percent	Cumulative Percent
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	17	70.8	70.8	70.8
	Selected	7	29.2	29.2	100.0
	Total	24	100.0	100.0	

q17_8 Intern skills set: Other

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	22	91.7	91.7	91.7
	Selected	2	8.3	8.3	100.0
	Total	24	100.0	100.0	

q17a Other specified

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		22	91.7	91.7	91.7
	in general we consider an intern to be at our facility for thier benifit and education not necessarily ours.	1	4.2	4.2	95.8
	Tooling Design	1	4.2	4.2	100.0
	Total	24	100.0	100.0	

q18a Communication

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Dissatisfied	3	12.5	12.5	12.5
	Somewhat Satisfied	8	33.3	33.3	45.8
	Very Satisfied	11	45.8	45.8	91.7
	No Previous Experience	2	8.3	8.3	100.0
	Total	24	100.0	100.0	

q18b Problem solving

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Dissatisfied	3	12.5	12.5	12.5
	Somewhat Satisfied	8	33.3	33.3	45.8
	Very Satisfied	11	45.8	45.8	91.7
	No Previous Experience	2	8.3	8.3	100.0
	Total	24	100.0	100.0	

q18c Processing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Dissatisfied	1	4.2	4.3	4.3
	Somewhat Satisfied	7	29.2	30.4	34.8
	Very Satisfied	10	41.7	43.5	78.3
	No Previous Experience	5	20.8	21.7	100.0
	Total	23	95.8	100.0	
Missing	System	1	4.2		
Total		24	100.0		

q18d Design

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Dissatisfied	3	12.5	13.0	13.0
	Somewhat Satisfied	7	29.2	30.4	43.5
	Very Satisfied	7	29.2	30.4	73.9
	No Previous Experience	6	25.0	26.1	100.0
	Total	23	95.8	100.0	
Missing	System	1	4.2		
Total		24	100.0		

q18e Materials knowledge

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Dissatisfied	2	8.3	8.3	8.3
	Somewhat Satisfied	7	29.2	29.2	37.5
	Very Satisfied	11	45.8	45.8	83.3
	No Previous Experience	4	16.7	16.7	100.0
	Total	24	100.0	100.0	

q18f Compounding

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Dissatisfied	2	8.3	8.7	8.7
	Somewhat Satisfied	5	20.8	21.7	30.4
	Very Satisfied	6	25.0	26.1	56.5
	No Previous Experience	10	41.7	43.5	100.0
	Total	23	95.8	100.0	
	Somewhat Satisfied	8	33.3	33.3	45.8
	Very Satisfied	11	45.8	45.8	91.7
	No Previous Experience	2	8.3	8.3	100.0
	Total	24	100.0	100.0	

q18b Problem solving

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Dissatisfied	3	12.5	12.5	12.5
	Somewhat Satisfied	8	33.3	33.3	45.8
	Very Satisfied	11	45.8	45.8	91.7
	No Previous Experience	2	8.3	8.3	100.0
	Total	24	100.0	100.0	

q18c Processing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Dissatisfied	1	4.2	4.3	4.3
	Somewhat Satisfied	7	29.2	30.4	34.8
	Very Satisfied	10	41.7	43.5	78.3
	No Previous Experience	5	20.8	21.7	100.0
	Total	23	95.8	100.0	
Missing	System	1	4.2		

Total		24	100.0		

q18d Design

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Dissatisfied	3	12.5	13.0	13.0
	Somewhat Satisfied	7	29.2	30.4	43.5
	Very Satisfied	7	29.2	30.4	73.9
	No Previous Experience	6	25.0	26.1	100.0
	Total	23	95.8	100.0	
Missing	System	1	4.2		
Total		24	100.0		

q18e Materials knowledge

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Dissatisfied	2	8.3	8.3	8.3
	Somewhat Satisfied	7	29.2	29.2	37.5
	Very Satisfied	11	45.8	45.8	83.3
	No Previous Experience	4	16.7	16.7	100.0
	Total	24	100.0	100.0	

q18f Compounding

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Dissatisfied	2	8.3	8.7	8.7
	Somewhat Satisfied	5	20.8	21.7	30.4
	Very Satisfied	6	25.0	26.1	56.5
	No Previous Experience	10	41.7	43.5	100.0
	Total	23	95.8	100.0	
Missing	System	1	4.2		
Total		24	100.0		

q18g Testing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Dissatisfied	2	8.3	8.3	8.3
	Somewhat Satisfied	7	29.2	29.2	37.5
	Very Satisfied	9	37.5	37.5	75.0
	No Previous Experience	6	25.0	25.0	100.0
	Total	24	100.0	100.0	

q18h Other

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Dissatisfied	1	4.2	16.7	16.7
	Very Satisfied	1	4.2	16.7	33.3
	No Previous Experience	4	16.7	66.7	100.0
	Total	6	25.0	100.0	
Missing	System	18	75.0		
Total		24	100.0		

q18i Other specified

	Frequency	Percent	Valid Percent
	19	79.2	79.2
1st year intern	1	4.2	4.2
in the past when we have accepted an intern we wer looking for a person with an willingness to learn and experience what we have to offer. we have been satisified with the interns we have taken.	1	4.2	4.2
in the past when we have accepted an intern we wer looking for a person with an willingness to learn and experience what we have to offer. we have been satisified with the interns we have taken.	1	4.2	4.2
motivation, enthusi	1	4.2	4.2
N/A	1	4.2	4.2
Tooling - Injection	1	4.2	4.2
Total	24	100.0	100.0

q18i Other specified

		Cumulative Percent
Valid		79.2
	1st year intern	83.3
	in the past when we have accepted an intern we wer looking for a person with an willingness to learn and experience what we have to offer. we have been satisified with the interns we have taken.	87.5
	motivation, enthusi	91.7
	N/A	95.8
	Tooling - Injection	100.0
	Total	

q19 Plastics/Rubber interns are valuable to my company

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Sometimes	7	29.2	29.2	29.2
	Always	16	66.7	66.7	95.8
	I don't know	1	4.2	4.2	100.0
	Total	24	100.0	100.0	

q20 Company's perception of next 5 yrs, need for interns

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Be about the same	10	41.7	41.7	41.7
	Increase	14	58.3	58.3	100.0
	Total	24	100.0	100.0	

q21 Additional comments/suggestions

		Frequency	Percent	Valid Percent
Valid		17	70.8	70.8
	Ferris has a great program and need to continue with the interns.	1	4.2	4.2

	Q15- we have not hired an intern from either program. Q16- we have not taken an intern for several years. we have been contacted only one time in the last 10 years and that person found an internship elsewhere.	1	4.2	4.2
	This has been a postive experience for our company to have an intern that posed the willingness to learn and wasn't afraid to get involved with new customers, complex tooling and processes.	1	4.2	4.2
	We appreciate the partnership we have with FSU and are committed to improving how we can add more value to the relationship.	1	4.2	4.2
	We are very pleased with all of the Ferris Interns that we have employed with us thus far.	1	4.2	4.2
	We have been very satisfied with our intern and his ability to work both independently with minimal instruction as well as in a team setting.	1	4.2	4.2
	While we hav	1	4.2	4.2
	Total	24	100.0	100.0

q21 Additional comments/suggestions

		Cumulative Percent
Valid		70.8
	Ferris has a great program and need to continue with the interns.	75.0
	Q15- we have not hired an intern from either program. Q16- we have not taken an intern for several years. we have been contacted only one time in the last 10 years and that person found an internship elsewhere.	79.2
	This has been a postive experience for our company to have an intern that posed the willingness to learn and wasn't afraid to get involved with new customers, complex tooling and processes.	83.3
	We appreciate the partnership we have with FSU and are committed to improving how we can add more value to the relationship.	87.5
	We are very pleased with all of the Ferris Interns that we have employed with us thus far.	91.7
	We have been very satisfied with our intern and his ability to work both independently with minimal instruction as well as in a team setting.	95.8
	While we hav	100.0
	Total	

SUMMARY:

The respondents tended to be from the Plastics or combined industries with only one company identifying themselves as “rubber”. In addition, most of the respondent hire both interns and fulltime employees and many have current employees from the programs. Over 80% of the companies responded a being satisfied with the Ferris employees both from a performance and technical knowledge perspective.

When queried about technical areas of expertise, the companies responded with Polymer processing being very important (Q11a) which is the focus of the FSU education, Design being somewhat important (Q11b) and materials being very important (Q11d). The companies also indicated that Composite (Q11c), decoration and assembly (Q11e), Knowledge of ancillary equipment (Q11f), as “somewhat important”. Knowledge of Rubber (Q11g) materials compounding (Q11h) and Elastomers (Q11i) also identified as somewhat important, these skills, of course, are very important to the Rubber industry. The results are not surprising when you review the number of responding companies who consider themselves “Rubber” companies, we believe if there were a larger representation from the Rubber sector of the industry the result would be identified as “very important”.

When asked about the “personal attributes of an employee” (Q13) the companies responded with comments like; “Willingness to work”, “team player”, “self-starter” (motivated), “problem solver”, “detailed” and “accountability”, “confidence in technical knowledge”, “drive”, and “trustworthy”. On what “technical skills are important” (Q14) the companies responded with expected comments about “process skills, materials design knowledge and tooling knowledge”. Additionally the companies desire; “problem solving skills”, “program management knowledge”, “metrology”, “writing”, and “general trouble shooting” skills. Most of these skills are covered in the degree programs, the faculty will review these identified skills and assure they are covered adequately during our students’ education.

The company survey also investigated the knowledge expected from interns of our program. The skills expected (identified as important or somewhat important were, communication problem solving, and processing, skills which were not selected in high frequency were design, compounding, and materials testing. Questions 18 (a-h) asked if the companies were satisfied with the skills brought by interns, in general companies seemed to be very satisfied.

Finally, the companies were asked to make additional comments about interns and this is what was volunteered; “great program”, “positive experience”, “appreciate the partnership”, “pleased with the interns”, “very satisfied”.

CONCLUSION:
Of course students have unique personal skills and experiences, and we cannot pretend to satisfy all the desire skills of individual companies. The companies who

responded to our survey were satisfied with the skills obtained as students in our programs. We seem to be doing a very good job preparing the interns and graduates for the work place.

The program faculty need to investigate how well problem solving skills, program management knowledge, metrology, writing, and general trouble shooting skills are covered in the degree and strengthen those areas identified as lacking.

FERRIS STATE UNIVERSITY
IMAGINE MORE

Plastics & Rubber Faculty APR Survey

This is the faculty survey portion of the APR process that will be used to assess the effectiveness of the Plastics and Rubber programs from the faculty perspective and taken together with other surveys and industry inputs these will help in planning for the future of these programs. Please complete this survey and submit it as soon as possible. It will only be available until Monday (Aug 25) after which time the results are to be tallied. The survey is anonymous.

Q1 In which area do you do your *primary* teaching?

- ○ Plastics
- ○ Rubber

Q2 Which of these processing areas do you feel confident in your expertise to teach? (Please select all that apply.)

- ☐ Injection Molding
- ☐ Extrusion
- ☐ Blow Molding
- ☐ Thermoforming
- ☐ Thermoset Processes
- ☐ Rubber Processing
- ☐ Other

Please Specify:

Q3 Which of these other areas do you feel confident in your expertise to teach?

- [ ] Industry Survey Course
- [ ] Tooling
- [ ] Part Design
- [ ] Physical Properties
- [ ] Materials Selection
- [ ] Assembly
- [ ] Decorating/Finishing
- [ ] Flow Analysis
- [ ] Composites
- [ ] Project Management
- [ ] Cost Estimating
- [ ] Medical Devices
- [ ] Automation
- [ ] Rubber Compounding
- [ ] Testing for Rubber
- [ ] Other

Please Specify:

Q4 Do you feel courses are being properly assigned?

- ( ) Yes
- ( ) No

Q5 If not, please explain why you feel this way in the space provided below.

Q6 Please rate the following areas in *Plastics Processing Labs* as to their adequacy for educational purposes (instructional, safety, current relevance, etc.)

	Lacking	Marginal	Adequate	No Comment
Injection Molders	( )	( )	( )	( )
Blow Molders	( )	( )	( )	( )
Extrusion Lines	( )	( )	( )	( )
Thermoforming Equipment	( )	( )	( )	( )

Auxiliary/Ancillary Equipment	○	○	○	○
Tooling	○	○	○	○
Maintenance	○	○	○	○
Classroom/Prep-Room Facilities	○	○	○	○
Material Supplies	○	○	○	○

Q7 Please rate the following areas in *Rubber Processing Labs* as to their adequacy for educational purposes (instructional, safety, current relevance, etc.)

	Lacking	Marginal	Adequate	No Comment
Injection Molders	○	○	○	○
Compression Molders	○	○	○	○
Extrusion Lines	○	○	○	○
Compounding Extruders	○	○	○	○
Mixers	○	○	○	○
Mills	○	○	○	○
Auxiliary/Ancillary Equipment	○	○	○	○
Tooling	○	○	○	○
Maintenance	○	○	○	○
Classroom/Prep-Room Facilities	○	○	○	○
Material Supplies	○	○	○	○

Q8 Please rate the following areas in *Design/Tooling Labs* as to their adequacy for educational purposes (instructional, safety, current relevance, etc.)

	Lacking	Marginal	Adequate	No Comment
Computer Software	○	○	○	○
Computer Hardware	○	○	○	○
Computer Support	○	○	○	○
Classroom Facilities	○	○	○	○
Material Supplies	○	○	○	○

Q9 Please rate the following areas in *Testing Labs* as to their adequacy for educational purposes (instructional, safety, current relevance, etc.)

	Lacking	Marginal	Adequate	No Comment
Test Equipment	○	○	○	○
Maintenance	○	○	○	○
Classroom/Prep-Room Facilities	○	○	○	○
Material Supplies	○	○	○	○

Q10 Please rate the following areas in *Assembly, Decoration, Finishing Labs* as to their adequacy for educational purposes (instructional, safety, current relevance, etc.)

	Lacking	Marginal	Adequate	No Comment
Equipment	○	○	○	○
Maintenance	○	○	○	○
Classroom/Prep-Room Facilities	○	○	○	○
Material Supplies	○	○	○	○

Q11 Please rate the following areas in *Automation Labs* as to their adequacy for educational purposes (instructional, safety, current relevance, etc.)

	Lacking	Marginal	Adequate	No Comment
Equipment	○	○	○	○
Maintenance	○	○	○	○
Classroom/Prep-Room Facilities	○	○	○	○
Material Supplies	○	○	○	○

Q12 Please rate the following areas in *Lecturing Facilities* as to their adequacy for educational purposes (instructional, safety, current relevance, etc.)

	Lacking	Marginal	Adequate	No Comment
Classroom Facilities	○	○	○	○
Facilities Maintenance	○	○	○	○

Q13 Please rate the following areas in *Plastics Classes* as to their current class sizes.

	Under-utilized	Optimal for Learning	Too Crowded
Lecture Class Density	○	○	○
Laboratory Class Density	○	○	○

Q14 Please rate the following areas in *Rubber Classes* as to their current class sizes.

	Under-utilized	Optimal for Learning	Too Crowded
Lecture Class Density	○	○	○
Laboratory Class Density	○	○	○

Q15 How do you feel when labs and the associated lecture are taught by different instructors?

- ○ Bad idea
- ○ Can be made to work
- ○ Not a problem

Q16 Please elaborate on your response to question 15.

Q17 How valuable are "hands on" labs?

- ○ Optional
- ○ Good Adjunct
- ○ Necessary

Q18 Please indicate your level of agreement with the following statements.

	Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree	No Comment
Lab aides are available to insure maximum safety and effectiveness of instructional learning.	○	○	○	○	○	○
Scheduling of facilities is consistent with quality instruction.	○	○	○	○	○	○
Online classes are feasible.	○	○	○	○	○	○
"Lecture only" plastics/rubber courses for the AAS should be offered online.	○	○	○	○	○	○
"Lecture only" plastics/rubber courses for the BS should be offered online.	○	○	○	○	○	○
Any degree offered online should be a distinctly separate degree from those obtained on-campus.	○	○	○	○	○	○
Adequate internship opportunities are available that provide relevant work experience.	○	○	○	○	○	○

Program faculty has access to adequate funds for faculty development.	○	○	○	○	○	○
The advisory board has adequate influence in the programs.	○	○	○	○	○	○

Q19 Please indicate your opinion regarding the following statements about internships, co-op experiences, etc.

	Not Necessary	Optional	Important to Degree
Value of the internship experiences	○	○	○
The two internship requirement	○	○	○

Q20 Please use this space to provide any additional comments regarding internships you would like to share.

Q21 Please indicate your opinion regarding each of the following aspects of program meetings.

	Lacking	Adequate	Too Much	No Comment
Frequency of program meetings	○	○	○	○
Discussion of curriculum issues	○	○	○	○
Discussion of student issues	○	○	○	○
Discussion pertaining to teaching	○	○	○	○
Discussion of budget issues	○	○	○	○
Discussion of administration issues	○	○	○	○

Q22 Please utilize this space to provide any suggestions you have for additional course offerings beyond the current curriculum.

Q23 Please use this space for additional comments/suggestions.

Thank you for your time and input.

PLTE APR Frequencies ...Faculty

Prepared by: Institutional Research & Testing, 09/14

Statistics

	N				
	Valid	Missing	Mean	Median	Std. Deviation
q1 Area of primary teaching	6	0	1.17	1.00	.408
q2_1 Confident teaching: Injection Molding	5	1	.60	1.00	.548
q2_2 Confident teaching: Extrusion	5	1	.40	.00	.548
q2_3 Confident teaching: Blow Molding	5	1	.20	.00	.447
q2_4 Confident teaching: Thermoforming	5	1	.20	.00	.447
q2_5 Confident teaching: Thermoset Processes	5	1	.40	.00	.548
q2_6 Confident teaching: Rubber Processing	5	1	.40	.00	.548
q2_7 Confident teaching: Other	5	1	.20	.00	.447
q2a Other specified	6	0			
q3_1 Confident teaching: Industry Survey Course	5	1	.40	.00	.548
q3_2 Confident teaching: Tooling	5	1	.20	.00	.447
q3_3 Confident teaching: Part Design	5	1	.40	.00	.548
q3_4 Confident teaching: Physical Properties	5	1	.40	.00	.548
q3_5 Confident teaching: Materials Selection	5	1	.20	.00	.447
q3_6 Confident teaching: Assembly	5	1	.20	.00	.447
q3_7 Confident teaching: Decorating/Finishing	5	1	.20	.00	.447
q3_8 Confident teaching: Flow Analysis	5	1	.40	.00	.548
q3_9 Confident teaching: Composites	5	1	.20	.00	.447
q3_10 Confident teaching: Project Management	5	1	.20	.00	.447
q3_11 Confident teaching: Cost Estimating	5	1	.00	.00	.000
q3_12 Confident teaching: Medical Devices	5	1	.00	.00	.000
q3_13 Confident teaching: Automation	5	1	.20	.00	.447
q3_14 Confident teaching: Rubber Compounding	5	1	.20	.00	.447
q3_15 Confident teaching: Testing for Rubber	5	1	.40	.00	.548
q3_16 Confident teaching: Other	5	1	.00	.00	.000
q3a Other specified	6	0			
q4 Feel courses properly assigned	6	0	1.17	1.00	.408
q5 If not, why feel this way	6	0			
q6a Injection Molders	6	0	3.17	3.00	.408
q6b Blow Molders	6	0	2.33	2.00	.516
q6c Extrusion Lines	6	0	2.67	3.00	.516
q6d Thermoforming Equipment	6	0	2.17	2.00	.753
q6e Auxiliary/Ancillary Equipment	6	0	2.17	2.00	.408
q6f Tooling	6	0	2.33	2.00	.516
q6g Maintenance	6	0	2.17	2.50	.983
q6h Classroom/Prep-Room Facilities	6	0	2.67	3.00	.516
q6i Material Supplies	6	0	2.17	2.00	.408
q7a Injection Molders	6	0	2.17	1.50	1.472
q7b Compression Molders	6	0	2.67	2.50	1.211
q7c Extrusion Lines	6	0	2.67	2.00	1.033
q7d Compounding Extruders	6	0	2.83	2.50	.983
q7e Mixers	6	0	2.83	2.50	.983
q7f Mills	6	0	3.17	3.00	.753

Statistics

	N				
	Valid	Missing	Mean	Median	Std. Deviation
q7g Auxiliary/Ancillary Equipment	6	0	2.83	3.00	1.329
q7h Tooling	6	0	2.50	2.00	1.225
q7i Maintenance	6	0	2.33	2.00	1.366
q7j Classroom/Prep-Room Facilities	6	0	3.00	3.00	.894
q7k Material Supplies	6	0	3.17	3.00	.753
q8a Computer Software	6	0	3.17	3.00	.753
q8b Computer Hardware	6	0	2.67	2.50	1.211
q8c Computer Support	6	0	3.00	3.00	.894
q8d Classroom Facilities	6	0	3.00	3.00	.894
q8e Material Supplies	6	0	3.00	3.00	.894
q9a Test Equipment	6	0	2.67	2.50	.816
q9b Maintenance	6	0	2.67	2.50	.816
q9c Classroom/Prep-Room Facilities	6	0	2.83	3.00	.753
q9d Material Supplies	6	0	2.67	2.50	.816
q10a Equipment	6	0	3.00	3.00	.894
q10b Maintenance	6	0	3.33	3.00	.516
q10c Classroom/Prep-Room Facilities	6	0	3.00	3.00	.894
q10d Material Supplies	6	0	2.83	3.00	1.169
q11a Equipment	6	0	3.00	3.00	.632
q11b Maintenance	6	0	2.83	3.00	.753
q11c Classroom/Prep-Room Facilities	6	0	3.00	3.00	.894
q11d Material Supplies	6	0	3.00	3.00	.894
q12a Classroom Facilities	6	0	3.00	3.00	.000
q12b Facilities Maintenance	6	0	2.67	3.00	.516
q13a Lecture Class Density	6	0	2.17	2.00	.408
q13b Laboratory Class Density	6	0	2.83	3.00	.408
q14a Lecture Class Density	6	0	1.17	1.00	.408
q14b Laboratory Class Density	6	0	1.67	1.50	.816
q15 Feel when lab/lecture class taught by different instructors	6	0	1.50	1.50	.548
q16 Please elaborate	6	0			
q17 How valuable are "hands on" labs	6	0	2.67	3.00	.816
q18a Lab aides are available to insure maximum safety & effectiveness of instructional learning	6	0	2.50	2.50	1.517
q18b Scheduling of facilities is consistent with quality instruction	6	0	3.00	3.00	1.095
q18c Online classes are feasible	6	0	3.17	3.00	1.169
q18d "Lecture only" plastics/rubber courses for AAS should be offered online	6	0	3.17	3.00	.753
q18e "Lecture only" plastics/rubber courses for BS should be offered online	6	0	3.17	3.00	.753
q18f Online degrees should be distinctly different from on-campus degrees	6	0	3.33	3.50	1.211
q18g Adequate internship opportunities are available that provide relevant work experience	6	0	5.00	5.00	.000
q18h Program faculty has access to adequate funds for faculty development	6	0	3.67	4.00	1.506
q18i The advisory board has adequate influence in the programs	6	0	2.83	3.00	.983
q19a Value of the internship experiences	6	0	3.00	3.00	.000
q19b The two internship requirement	6	0	3.00	3.00	.000

Statistics

	N		Mean	Median	Std. Deviation
	Valid	Missing			
q20 Additional comments about internships	6	0			
q21a Frequency of program meetings	6	0	1.83	2.00	.408
q21b Discussion of curriculum issues	6	0	2.00	2.00	.632
q21c Discussion of student issues	6	0	2.00	2.00	.000
q21d Discussion pertaining to teaching	6	0	1.17	1.00	.408
q21e Discussion of budget issues	6	0	2.00	2.00	1.095
q21f Discussion of administration issues	6	0	1.83	2.00	.408
q22 Suggestions for additional course offerings	6	0			
q23 Additional comments/suggestions	6	0			

Frequency Table

q1 Area of primary teaching

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Plastics	5	83.3	83.3	83.3
	Rubber	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q2_1 Confident teaching: Injection Molding

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	2	33.3	40.0	40.0
	Selected	3	50.0	60.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q2_2 Confident teaching: Extrusion

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	3	50.0	60.0	60.0
	Selected	2	33.3	40.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q2_3 Confident teaching: Blow Molding

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	4	66.7	80.0	80.0
	Selected	1	16.7	20.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q2_4 Confident teaching: Thermoforming

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	4	66.7	80.0	80.0
	Selected	1	16.7	20.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q2_5 Confident teaching: Thermoset Processes

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	3	50.0	60.0	60.0
	Selected	2	33.3	40.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q2_6 Confident teaching: Rubber Processing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	3	50.0	60.0	60.0
	Selected	2	33.3	40.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q2_7 Confident teaching: Other

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	4	66.7	80.0	80.0
	Selected	1	16.7	20.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q2a Other specified

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		3	50.0	50.0	50.0
	Calendering	1	16.7	16.7	66.7
	Faculty should be capable (with preparation time) of instructing in all program areas	1	16.7	16.7	83.3
	I typically do not teach processing courses but am confident in the introductory courses. More advanced courses would take additional prep.	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q3_1 Confident teaching: Industry Survey Course

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	3	50.0	60.0	60.0
	Selected	2	33.3	40.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q3_2 Confident teaching: Tooling

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	4	66.7	80.0	80.0
	Selected	1	16.7	20.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q3_3 Confident teaching: Part Design

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	3	50.0	60.0	60.0
	Selected	2	33.3	40.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q3_4 Confident teaching: Physical Properties

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	3	50.0	60.0	60.0
	Selected	2	33.3	40.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q3_5 Confident teaching: Materials Selection

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	4	66.7	80.0	80.0
	Selected	1	16.7	20.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q3_6 Confident teaching: Assembly

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	4	66.7	80.0	80.0
	Selected	1	16.7	20.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q3_7 Confident teaching: Decorating/Finishing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	4	66.7	80.0	80.0
	Selected	1	16.7	20.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q3_8 Confident teaching: Flow Analysis

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	3	50.0	60.0	60.0
	Selected	2	33.3	40.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q3_9 Confident teaching: Composites

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	4	66.7	80.0	80.0
	Selected	1	16.7	20.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q3_10 Confident teaching: Project Management

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	4	66.7	80.0	80.0
	Selected	1	16.7	20.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q3_11 Confident teaching: Cost Estimating

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	5	83.3	100.0	100.0
Missing	System	1	16.7		
Total		6	100.0		

q3_12 Confident teaching: Medical Devices

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	5	83.3	100.0	100.0
Missing	System	1	16.7		
Total		6	100.0		

q3_13 Confident teaching: Automation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	4	66.7	80.0	80.0
	Selected	1	16.7	20.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q3_14 Confident teaching: Rubber Compounding

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	4	66.7	80.0	80.0
	Selected	1	16.7	20.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q3_15 Confident teaching: Testing for Rubber

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	3	50.0	60.0	60.0
	Selected	2	33.3	40.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q3_16 Confident teaching: Other

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Selected	5	83.3	100.0	100.0
Missing	System	1	16.7		
Total		6	100.0		

q3a Other specified

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		6	100.0	100.0	100.0

q4 Feel courses properly assigned

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	5	83.3	83.3	83.3
	No	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q5 If not, why feel this way

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		5	83.3	83.3	83.3
	Ownership should be assigned to classes.	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q6a Injection Molders

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Adequate	5	83.3	83.3	83.3
	No Comment	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q6b Blow Molders

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Marginal	4	66.7	66.7	66.7
	Adequate	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q6c Extrusion Lines

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Marginal	2	33.3	33.3	33.3
	Adequate	4	66.7	66.7	100.0
	Total	6	100.0	100.0	

q6d Thermoforming Equipment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Lacking	1	16.7	16.7	16.7
	Marginal	3	50.0	50.0	66.7
	Adequate	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q6e Auxiliary/Ancillary Equipment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Marginal	5	83.3	83.3	83.3
	Adequate	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q6f Tooling

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Marginal	4	66.7	66.7	66.7
	Adequate	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q6g Maintenance

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Lacking	2	33.3	33.3	33.3
	Marginal	1	16.7	16.7	50.0
	Adequate	3	50.0	50.0	100.0
	Total	6	100.0	100.0	

q6h Classroom/Prep-Room Facilities

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Marginal	2	33.3	33.3	33.3
	Adequate	4	66.7	66.7	100.0
	Total	6	100.0	100.0	

q6i Material Supplies

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Marginal	5	83.3	83.3	83.3
	Adequate	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q7a Injection Molders

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Lacking	3	50.0	50.0	50.0
	Marginal	1	16.7	16.7	66.7
	No Comment	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q7b Compression Molders

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Lacking	1	16.7	16.7	16.7
	Marginal	2	33.3	33.3	50.0
	Adequate	1	16.7	16.7	66.7
	No Comment	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q7c Extrusion Lines

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Marginal	4	66.7	66.7	66.7
	No Comment	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q7d Compounding Extruders

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Marginal	3	50.0	50.0	50.0
	Adequate	1	16.7	16.7	66.7
	No Comment	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q7e Mixers

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Marginal	3	50.0	50.0	50.0
	Adequate	1	16.7	16.7	66.7
	No Comment	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q7f Mills

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Marginal	1	16.7	16.7	16.7
	Adequate	3	50.0	50.0	66.7
	No Comment	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q7g Auxiliary/Ancillary Equipment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Lacking	1	16.7	16.7	16.7
	Marginal	2	33.3	33.3	50.0
	No Comment	3	50.0	50.0	100.0
	Total	6	100.0	100.0	

q7h Tooling

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Lacking	1	16.7	16.7	16.7
	Marginal	3	50.0	50.0	66.7
	No Comment	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q7i Maintenance

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Lacking	2	33.3	33.3	33.3
	Marginal	2	33.3	33.3	66.7
	No Comment	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q7j Classroom/Prep-Room Facilities

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Marginal	2	33.3	33.3	33.3
	Adequate	2	33.3	33.3	66.7
	No Comment	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q7k Material Supplies

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Marginal	1	16.7	16.7	16.7
	Adequate	3	50.0	50.0	66.7
	No Comment	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q8a Computer Software

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Marginal	1	16.7	16.7	16.7
	Adequate	3	50.0	50.0	66.7
	No Comment	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q8b Computer Hardware

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Lacking	1	16.7	16.7	16.7
	Marginal	2	33.3	33.3	50.0
	Adequate	1	16.7	16.7	66.7
	No Comment	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q8c Computer Support

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Marginal	2	33.3	33.3	33.3
	Adequate	2	33.3	33.3	66.7
	No Comment	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q8d Classroom Facilities

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Marginal	2	33.3	33.3	33.3
	Adequate	2	33.3	33.3	66.7
	No Comment	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q8e Material Supplies

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Marginal	2	33.3	33.3	33.3
	Adequate	2	33.3	33.3	66.7
	No Comment	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q9a Test Equipment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Marginal	3	50.0	50.0	50.0
	Adequate	2	33.3	33.3	83.3
	No Comment	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q9b Maintenance

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Marginal	3	50.0	50.0	50.0
	Adequate	2	33.3	33.3	83.3
	No Comment	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q9c Classroom/Prep-Room Facilities

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Marginal	2	33.3	33.3	33.3
	Adequate	3	50.0	50.0	83.3
	No Comment	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q9d Material Supplies

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Marginal	3	50.0	50.0	50.0
	Adequate	2	33.3	33.3	83.3
	No Comment	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q10a Equipment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Marginal	2	33.3	33.3	33.3
	Adequate	2	33.3	33.3	66.7
	No Comment	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q10b Maintenance

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Adequate	4	66.7	66.7	66.7
	No Comment	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q10c Classroom/Prep-Room Facilities

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Marginal	2	33.3	33.3	33.3
	Adequate	2	33.3	33.3	66.7
	No Comment	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q10d Material Supplies

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Lacking	1	16.7	16.7	16.7
	Marginal	1	16.7	16.7	33.3
	Adequate	2	33.3	33.3	66.7
	No Comment	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q11a Equipment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Marginal	1	16.7	16.7	16.7
	Adequate	4	66.7	66.7	83.3
	No Comment	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q11b Maintenance

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Marginal	2	33.3	33.3	33.3
	Adequate	3	50.0	50.0	83.3
	No Comment	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q11c Classroom/Prep-Room Facilities

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Marginal	2	33.3	33.3	33.3
	Adequate	2	33.3	33.3	66.7
	No Comment	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q11d Material Supplies

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Marginal	2	33.3	33.3	33.3
	Adequate	2	33.3	33.3	66.7
	No Comment	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q12a Classroom Facilities

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Adequate	6	100.0	100.0	100.0

q12b Facilities Maintenance

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Marginal	2	33.3	33.3	33.3
	Adequate	4	66.7	66.7	100.0
	Total	6	100.0	100.0	

q13a Lecture Class Density

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Optimal for Learning	5	83.3	83.3	83.3
	Too Crowded	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q13b Laboratory Class Density

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Optimal for Learning	1	16.7	16.7	16.7
	Too Crowded	5	83.3	83.3	100.0
	Total	6	100.0	100.0	

q14a Lecture Class Density

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Under-utilized	5	83.3	83.3	83.3
	Optimal for Learning	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q14b Laboratory Class Density

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Under-utilized	3	50.0	50.0	50.0
	Optimal for Learning	2	33.3	33.3	83.3
	Too Crowded	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q15 Feel when lab/lecture class taught by different instructors

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bad idea	3	50.0	50.0	50.0
	Can be made to work	3	50.0	50.0	100.0
	Total	6	100.0	100.0	

q16 Please elaborate

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	16.7	16.7	16.7
	As long as the instructors actively communicate it can work, it is not the ideal situation	1	16.7	16.7	33.3
	I taught one lab section of the PPET 115 course last year while another instructor taught the lecture and all other labs. It was a very awkward experience for the students in my lab section.	1	16.7	16.7	50.0
	If labs are suppose to be an adjunct to the theoretical learning presented in lecture then coherence requires lecture and labs be in sequence. Since instructors are not at all interchangeable, they teach at different rates and with different emphasis depending upon their experiences and also the specific class make-up, lab activities and assignments are far more valuable if there is logical coherence with what transpires topically in lecture. That connection and subsequent learning opportunities are lost when lecture and labs are taught by separate individuals. The quality of the educational experience for the student is sacrificed. Past experiences brought on by a push for increasing efficiencies bear this out.	1	16.7	16.7	66.7
	Lecture and lab grades must be separated for this to work	1	16.7	16.7	83.3
	The technological background and the theoretical information of both plastic and rubber technologies are more suitable to be taught at graduate school. We are running a great and reasonably successful experiment of hands-on training that combines apprentice and engineering education. The best way to allow this to work for high school graduates is to make our students learning from doing. I strongly disagree to separate lecture from lab.	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q17 How valuable are "hands on" labs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Optional	1	16.7	16.7	16.7
	Necessary	5	83.3	83.3	100.0
	Total	6	100.0	100.0	

q18a Lab aides are available to insure maximum safety & effectiveness of instructional learning

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	33.3	33.3	33.3
	Somewhat Disagree	1	16.7	16.7	50.0
	Neutral	2	33.3	33.3	83.3
	Strongly Agree	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q18b Scheduling of facilities is consistent with quality instruction

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	3	50.0	50.0	50.0
	Somewhat Agree	3	50.0	50.0	100.0
	Total	6	100.0	100.0	

q18c Online classes are feasible

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	2	33.3	33.3	33.3
	Neutral	2	33.3	33.3	66.7
	Somewhat Agree	1	16.7	16.7	83.3
	Strongly Agree	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q18d "Lecture only" plastics/rubber courses for AAS should be offered online

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	1	16.7	16.7	16.7
	Neutral	3	50.0	50.0	66.7
	Somewhat Agree	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q18e "Lecture only" plastics/rubber courses for BS should be offered online

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	1	16.7	16.7	16.7
	Neutral	3	50.0	50.0	66.7
	Somewhat Agree	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q18f Online degrees should be distinctly different from on-campus degrees

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	2	33.3	33.3	33.3
	Neutral	1	16.7	16.7	50.0
	Somewhat Agree	2	33.3	33.3	83.3
	Strongly Agree	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q18g Adequate internship opportunities are available that provide relevant work experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	6	100.0	100.0	100.0

q18h Program faculty has access to adequate funds for faculty development

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	2	33.3	33.3	33.3
	Somewhat Agree	3	50.0	50.0	83.3
	No Comment	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q18i The advisory board has adequate influence in the programs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	16.7	16.7	16.7
	Neutral	4	66.7	66.7	83.3
	Somewhat Agree	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q19a Value of the internship experiences

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Important to Degree	6	100.0	100.0	100.0

q19b The two internship requirement

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Important to Degree	6	100.0	100.0	100.0

q20 Additional comments about internships

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		3	50.0	50.0	50.0
	I believe both internship experiences are important for a good many reasons. Aside from the more obvious reasons there are a couple that should not be underestimated. The first internship is important getting students into a manufacturing facility early enough in the academic process to allow them to experience the environment in which they intend to spend for their working career thus giving them the opportunity to see if they really want to finish pursuing the degree. The second internship is important not only for the actual engineering work experiences but also allows both employer and student to seek a match.	1	16.7	16.7	66.7

q20 Additional comments about internships

		Frequency	Percent	Valid Percent	Cumulative Percent
	Internships in my opinion are what make our students marketable to industry	1	16.7	16.7	83.3
	Our department had an "intern coordinator" in the past that was paid a stipend. This position disappeared 12-years ago (?) approximately when our enrollment (and number of interns) decreased. Our enrollment has rapidly increased each of the last two years. We should investigate whether the position could be resumed. I believe some other colleges have a permanent position for an intern coordinator (such as Paul Kwant in Business).	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q21a Frequency of program meetings

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Lacking	1	16.7	16.7	16.7
	Adequate	5	83.3	83.3	100.0
	Total	6	100.0	100.0	

q21b Discussion of curriculum issues

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Lacking	1	16.7	16.7	16.7
	Adequate	4	66.7	66.7	83.3
	Too Much	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q21c Discussion of student issues

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Adequate	6	100.0	100.0	100.0

q21d Discussion pertaining to teaching

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Lacking	5	83.3	83.3	83.3
	Adequate	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q21e Discussion of budget issues

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Lacking	2	33.3	33.3	33.3
	Adequate	3	50.0	50.0	83.3
	No Comment	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q21f Discussion of administration issues

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Lacking	1	16.7	16.7	16.7
	Adequate	5	83.3	83.3	100.0
	Total	6	100.0	100.0	

q22 Suggestions for additional course offerings

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		6	100.0	100.0	100.0

q23 Additional comments/suggestions

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		5	83.3	83.3	83.3
	Some additional comments regarding question 18 (online instruction). Online courses are very feasible for some subjects and less so for others. Offering fully online courses to our on-campus PLTS student population is not necessary. If we developed fully online courses, I believe there would be a market for this from off campus students, industry professionals, and other students (such as College of Business students). If a fully online degree were offered, it would likely not resemble our current degree due to the lack of suitability of some of our lab courses for online delivery. Given that our faculty are currently overloaded, it is unlikely that our group has interest in exploring online options in the foreseeable future. It is not required that courses be offered fully "face to face" or "online". The "mixed delivery" format is being used by many courses throughout the university. This allows for any mix of online and face-to-face delivery. One final comment - at a minimum, all courses should be required to use FerrisConnect to post assignments, handouts, and maintain a grade book. Students now use this in the majority of their courses and instructors that do not use it are viewed as technologically challenged.	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

Section 2E

Summary Survey

Faculty Survey Summary

Disclaimer: It must be pointed out that this faculty survey was administered anonymously and that presents a few possible scenarios for erroneous conclusions to be drawn. In some areas where multiple individuals answered a particular survey question with a response rating equipment, materials, maintenance, etc., when the reality is only a single individual has ever actually taught in that area then the aggregate response may actually be misleading. For instance an individual who actually teaches the relevant course happens to provide a "lacking" response, his response can be drowned out by several others who've never taught the course claiming "adequate" or "marginal", thus the aggregate response does not appear to be a strong indicator of need or issues when in actuality this might not be the case. Thus these types of "hidden" strong indicators have been muted.

Strong survey response indicators consistent with program goals:

Current class density is considered optimal for learning.

The "hands-on" nature of the lab section of a course is viewed as a necessary feature of the course work and required to obtain skills needed by industry.

The internship experience is highly supported and the need for two internships, one for each degree, is deemed necessary to the educational goals and the employability of the graduate.

Important survey response indicators suggesting action:

Laboratory class sizes are viewed as too crowded for proper instruction.

Only a single individual feels confident in teaching the blow molding and thermoforming processes, which may reflect upon skills desired for the next faculty search.

Only a single individual feels confident in teaching tooling, material selection, assembly/decorating/finishing, composites, program management, automation, which may reflect upon skills desired for the next faculty search or suggest direction of next curriculum revision to take.

There is no one within the faculty that capable of teaching cost estimating, medical devices.

Section 2D

SURVEY SUMMARY

Student Survey Summary

Strong survey response indicators that are consistent with program goals:

- Current student perceptions relative to curriculum matching industry needs using appropriate methods:
    - Lab structured to reinforce course principles:
        - Processing – 96.2% (highly related or most principles)
        - Design – 91.3% (same)
        - Testing – 83.3% (same)
        - Decoration & Assembly – 87.5 (same)
    - Satisfied with education, meets expectations- 96.3% ("very" and "somewhat"), 70.4% ("very")

- As a program model, the following student perceptions relate to the current program setup:
    - Necessary lab experience to skills development
        - 100% indispensable , augments learning
    - Course material consistent one to another
        - 96.2% indicated consistency felt
    - Courses related to each other
        - 100% felt courses were related
    - Student to teacher ratio
        - 53.8% - optimal
        - 42.3% - too many students
    - State of laboratory equipment to industry
        - Testing
            - 52.2% - equipment representative
        - Tooling
            - 56.5% - equipment representative
        - Design
            - 83.3% - equipment representative
        - Processing
            - 81.8% - equipment representative
        - Decoration and Assembly
            - 59.1% - equipment representative
        - Lab equipment well maintained
            - 94.9% agree

- In relation to faculty development for effectiveness:
    - Instructor qualification to teach course
        - 100% agree
    - Course content consistent with what I need to learn
        - 96.7%
    - Course in line with my needs / interests
        - 96.7%
- In relation to recruiting and retention:
    - Program represents a good value for the money
        - 100% agree
    - Made right choice selecting Plastics Program
        - 100% agree
    - Comfortable recommending Plastics Program
        - 100% agree

Strong survey response indicators suggesting action:

- As a program model, the following student perception relate to the current program setup:
    - Courses structured to develop skills for a job
        - 33.3% - High level, mastered skills
        - 66.7% - Relevant skills, not mastered
    - State of laboratory equipment
        - Processing
            - 11.5% state of art , 69.2% current
        - Decoration and Assembly
            - 4.5% state of art, 54.5% current
        - Project Management Software
            - 9.5% state of art, 76.2% current
- In relation to program visibility
    - Knowledge of placement / salary data
        - 82.1% students, 64.3% parents

Strong survey additional comments suggesting action:

- High mention of campus visit & tour of facility in “why coming to FSU Plastics Program”
- High mention of faculty input & recruiting in “why coming to FSU Plastics Program”
- Perception of great placement opportunities and job titles after degree
- 96.3% believe that internships were valuable to their educational experience
- 28.6% of respondents transferred from another curriculum or school

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Plastics Engineering Technology APR - Current Students

As part of the Academic Program Review (APR) process, the Plastics Department is asking current Ferris State University Plastics students to please take a few minutes to complete this survey. Your responses are very important for the improvement and continued success of the Plastics Engineering Technology program.

Q1 Which degree are you currently trying to obtain in the Plastics Program?

- ◯ Associate's
- ◯ Bachelor's
- ◯ Both

Q2 Which internship(s) have you completed?

- ◯ None
- ◯ 1st
- ◯ 2nd
- ◯ Both

Q3 What is your transfer status?

- ◯ None, didn't transfer into PLTS from anywhere
- ◯ Transferred in from another FSU curriculum
- ◯ Transferred from a college/university outside of FSU

Q4 What are your plans/goals after completing your FSU degree(s)?

- ◯ Further education
- ◯ Work
- ◯ Work & Education
- ◯ Other

Please Specify:

Q5 Are you aware of the placement data & average starting salaries for the graduates of the Plastics programs?

- ◯ No
- ◯ Placement data only
- ◯ Average starting salaries only
- ◯ Both
- ◯ Other data about the program(s)

Please Specify:

Q6 Is/are your parent(s) aware of the placement data & average starting salaries for the graduates of the Plastics programs?

- ◯ No
- ◯ Placement data only
- ◯ Average starting salaries only
- ◯ Both
- ◯ Other data about the program(s)

Please Specify:

Q7 Please indicate your opinion of how relevant you feel each of the following Plastics courses have been so far in regard to your career expectations:

	Haven't Taken Yet	Not Relevant	Somewhat Relevant	Very Relevant
PPET100: Survey of Plastics & Elastomer Technology	◯	◯	◯	◯
PPET115: Plastics Product Manufacturing	◯	◯	◯	◯
PPET120: Plastics & Polymer Material Selection 1	◯	◯	◯	◯
PPET127: Intro to Processing	◯	◯	◯	◯
PPET211: Intro to Injection Molding	◯	◯	◯	◯
PPET212: Plastics Product & Tool Design 1	◯	◯	◯	◯
PPET223: Plastics Testing	◯	◯	◯	◯
PLTS300: Plastics Engineering Management	◯	◯	◯	◯
PLTS312: Plastics Product & Tool Design 2	◯	◯	◯	◯

PLTS320: Plastics & Elastic Materials	○	○	○	○
PLTS321: Advanced Injection Molding	○	○	○	○
PLTS410: Plastics Costing, Packaging & Economics	○	○	○	○
PLTS411: Plastics Decorating & Assembly	○	○	○	○
PLTS499: Plastics Career Skills	○	○	○	○
PPETXXX: Additional Plastics Electives that have been offered	○	○	○	○

Q8 In your opinion, how necessary do you feel the following Plastics courses are for a "complete" Plastics curriculum?

	Haven't Taken Yet	Should Not Be In	Not Core, but Technical Elective	Not Vital, but Core	Essential
PPET100: Survey of Plastics & Elastomer Technology	○	○	○	○	○
PPET115: Plastics Product Manufacturing	○	○	○	○	○
PPET120: Plastics & Polymer Material Selection 1	○	○	○	○	○
PPET127: Intro to Processing	○	○	○	○	○
PPET211: Intro to Injection Molding	○	○	○	○	○
PPET212: Plastics Product & Tool Design 1	○	○	○	○	○
PPET223: Plastics Testing	○	○	○	○	○
PLTS300: Plastics Engineering Management	○	○	○	○	○
PLTS312: Plastics Product & Tool Design 2	○	○	○	○	○
PLTS320: Plastics & Elastic Materials	○	○	○	○	○
PLTS321: Advanced Injection Molding	○	○	○	○	○
PLTS410: Plastics Costing, Packaging & Economics	○	○	○	○	○
PLTS411: Plastics Decorating & Assembly	○	○	○	○	○
PLTS499: Plastics Career Skills	○	○	○	○	○
PPETXXX: Additional Plastics Electives that have been offered	○	○	○	○	○

Q9 Please indicate your level of satisfaction with the training/education you received from the Plastics program in terms of meeting your expectations.

- ◯ Very Dissatisfied
- ◯ Somewhat Dissatisfied
- ◯ Somewhat Satisfied
- ◯ Very Satisfied

Q10 How well do you feel the Plastics courses are structured to help you develop the skill sets necessary for employment in the Plastics industry?

- ◯ Skill sets are not really taught
- ◯ Skill sets are not in keeping with industry needs
- ◯ Relevant skill sets are taught but not fully mastered
- ◯ Highly relevant skill sets are mastered

Q11 How necessary do you feel the lab experiences have been to developing those skill sets?

- ◯ Skill sets are not really taught
- ◯ Somewhat helpful but not necessary to development of skill sets
- ◯ Provides nice augmentation for skill set development
- ◯ Indispensable to developing skill sets

Q12 To what degree do you believe labs are structured to reinforce the theoretical principles discussed in the lecture courses listed below?

	Essentially No Principles Reinforced	Some Principles Reinforced	Most Principles Reinforced	All Principles Reinforced
Processing courses	◯	◯	◯	◯
Product & Tooling Design courses	◯	◯	◯	◯
Testing course	◯	◯	◯	◯
Plastics Engineering Management course	◯	◯	◯	◯
Plastics Decorating & Assembly course	◯	◯	◯	◯

Q13 How consistent is the Plastics material taught from course to course?

- ◯ Very inconsistent (becomes an obstacle)
- ◯ Somewhat inconsistent (makes some material confusing)
- ◯ Somewhat consistent (noticeable, but no effect on comprehension of course material)
- ◯ Very consistent

Q14 How closely are your Plastics courses related to each other?

- ◯ Not related at all ("stand alone")
- ◯ Somewhat related
- ◯ Highly related

Q15 How do you feel about the current student/teacher ratio in your Plastics courses?

- ◯ Too many students
- ◯ Too few students
- ◯ Optimal ratio

Q16 Please indicate how up-to-date you feel the current equipment is in each of the following labs:

	Very Outdated	Somewhat Outdated (Some relevance to current industry)	Up-to-Date (Representative of current industry)	State-of-the-Art
Testing Lab (PPET223)	◯	◯	◯	◯
Tooling Lab	◯	◯	◯	◯
CAD & flow analysis software	◯	◯	◯	◯
Processing Labs	◯	◯	◯	◯
Decorating & Assembly Labs	◯	◯	◯	◯
Project Management software	◯	◯	◯	◯

Q17 Please indicate your level of agreement with each of the following statements:

	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree
The instructors are well qualified to teach their respective courses.	◯	◯	◯	◯
The course content is consistent with what I need to learn to work in the industry.	◯	◯	◯	◯
The Plastics program represents a good value for the money spent.	◯	◯	◯	◯
Each course content is in line with my needs/interests.	◯	◯	◯	◯
There are enough workstations in the lab for current class sizes.	◯	◯	◯	◯
I feel safe when working in the non-computer labs.	◯	◯	◯	◯
The lab equipment in the testing labs is well-maintained.	◯	◯	◯	◯

The lab equipment in the decorating & assembly labs is well-maintained.	○	○	○	○
The lab equipment in the computer labs is well-maintained.	○	○	○	○
The internship experience(s) was/were valuable to my education.	○	○	○	○
My advisor has been valuable in guiding my choices.	○	○	○	○
I made the right choice in selecting the Plastics program at FSU.	○	○	○	○
I am comfortable recommending FSU's Plastics program to others.	○	○	○	○

Q18 Please indicate here where you will be attending school and/or working after graduation.

Q19 Why did you select Plastics Engineering Technology as your major?

Q20 Specifically, what helped you choose to attend FSU's Plastics Engineering Technology program?

Q21 What opportunities do you feel will be available to you as a graduate of the FSU Plastics program?

Q22 Please use this space for additional comments.

Thank you for your time and input.

PLTE APR Frequencies ... Current Students

Prepared by: Institutional Research & Testing, 08/14

Statistics

	N				
	Valid	Missing	Mean	Median	Std. Deviation
q1 Degree currently trying to obtain	28	0	2.68	3.00	.548
q2 Internship(s) completed	28	0	2.39	2.00	1.100
q3 Transfer status	28	0	1.39	1.00	.685
q4 Plans/goals	28	0	2.36	2.00	.488
q4a Other specified	28	0			
q5 Aware of placement data/avg starting salaries	28	0	3.68	4.00	.772
q5a Other specified	28	0			
q6 Parents aware of placement data/avg starting salaries	28	0	3.07	4.00	1.359
q6a Other specified	28	0			
q7a PPET100: Survey of Plastics & Elastomer Technology	28	0	3.54	4.00	.962
q7b PPET115: Plastics Product Manufacturing	28	0	3.46	4.00	1.071
q7c PPET120: Plastics & Polymer Material Selection 1	28	0	3.29	4.00	1.150
q7d PPET127: Intro to Processing	28	0	3.43	4.00	1.168
q7e PPET211: Intro to Injection Molding	28	0	2.29	1.00	1.512
q7f PPET212: Plastics Product & Tool Design 1	28	0	1.93	1.00	1.386
q7g PPET223: Plastics Testing	28	0	1.89	1.00	1.286
q7h PLTS300: Plastics Engineering Management	28	0	1.46	1.00	1.071
q7i PLTS312: Plastics Product & Tool Design 2	28	0	1.64	1.00	1.193
q7j PLTS320: Plastics & Elastic Materials	28	0	1.64	1.00	1.254
q7k PLTS321: Advanced Injection Molding	28	0	1.43	1.00	1.069
q7l PLTS410: Plastics Costing, Packaging & Economics	28	0	1.32	1.00	.863
q7m PLTS411: Plastics Decorating & Assembly	28	0	1.29	1.00	.854
q7n PLTS499: Plastics Career Skills	28	0	1.39	1.00	.994
q7o PPETXXX: Additional Plastics Electives that have been offered	28	0	1.68	1.00	1.124
q8a PPET100: Survey of Plastics & Elastomer Technology	26	2	4.19	5.00	1.386
q8b PPET115: Plastics Product Manufacturing	27	1	4.11	5.00	1.502
q8c PPET120: Plastics & Polymer Material Selection 1	28	0	4.18	5.00	1.467
q8d PPET127: Intro to Processing	28	0	4.36	5.00	1.420
q8e PPET211: Intro to Injection Molding	28	0	3.11	4.50	2.006
q8f PPET212: Plastics Product & Tool Design 1	28	0	2.86	2.00	1.938
q8g PPET223: Plastics Testing	28	0	2.43	1.00	1.665
q8h PLTS300: Plastics Engineering Management	28	0	2.07	1.00	1.631
q8i PLTS312: Plastics Product & Tool Design 2	28	0	2.29	1.00	1.802
q8j PLTS320: Plastics & Elastic Materials	28	0	2.29	1.00	1.902
q8k PLTS321: Advanced Injection Molding	28	0	2.00	1.00	1.678
q8l PLTS410: Plastics Costing, Packaging & Economics	28	0	1.93	1.00	1.489

Statistics

	N				
	Valid	Missing	Mean	Median	Std. Deviation
q8m PLTS411: Plastics Decorating & Assembly	28	0	1.61	1.00	1.257
q8n PLTS499: Plastics Career Skills	28	0	1.89	1.00	1.499
q8o PPETXXX: Additional Plastics Electives	28	0	2.00	1.00	1.466
q9 Level of satisfaction with training/education received	27	1	3.63	4.00	.688
q10 How well courses structured to develop skills	27	1	3.33	3.00	.480
q11 How necessary are lab experiences	27	1	3.52	4.00	.509
q12a Processing courses	26	2	3.65	4.00	.562
q12b Product & Tooling Design courses	23	5	3.30	3.00	.765
q12c Testing course	24	4	3.25	3.00	.847
q12d Plastics Engineering Management course	24	4	3.04	3.00	.806
q12e Plastics Decorating & Assembly course	24	4	3.21	3.00	.658
q13 Consistency of Plastics material course to course	26	2	3.42	3.00	.578
q14 How closely Plastics courses related to each other	26	2	2.69	3.00	.471
q15 Feelings about current student/teacher ratio	26	2	2.12	3.00	.993
q16a Testing Lab (PPET223)	23	5	2.48	3.00	.593
q16b Tooling Lab	23	5	2.52	3.00	.593
q16c CAD & flow analysis software	24	4	2.96	3.00	.690
q16d Processing Labs	26	2	2.92	3.00	.560
q16e Decorating & Assembly Labs	22	6	2.64	3.00	.581
q16f Project Management software	21	7	2.95	3.00	.498
q17a Instructors well qualified for respective courses	27	1	3.74	4.00	.447
q17b Course content consistent with what I need to learn	27	1	3.56	4.00	.577
q17c Represents good value for my money	27	1	3.56	4.00	.506
q17d Course content is in line with my needs/interests	27	1	3.48	4.00	.580
q17e Enough workstations in the lab	27	1	3.41	4.00	.694
q17f Feel safe when working in the non-computer labs	27	1	3.81	4.00	.396
q17g Lab equipment in testing labs is well-maintained	26	2	3.38	3.00	.637
q17h Lab equipment in decorating & assembly labs is well-maintained	24	4	3.38	3.00	.495
q17i Lab equipment in computer labs is well-maintained	26	2	3.31	3.00	.618
q17j Internship experience(s) was/were valuable	27	1	3.74	4.00	.526
q17k My advisor has been valuable in guiding my choices	27	1	3.56	4.00	.577
q17l Made right choice selecting Plastics	27	1	3.85	4.00	.362
q17m Comfortable recommending Plastics to others	26	2	3.88	4.00	.326
q18 Where attend school/working after graduation	28	0			
q19 Why select Plastics as major	28	0			
q20 Specifically, what helped you choose	28	0			
q21 Opportunities available to you	28	0			
q22 Additional comments	28	0			

Frequency Table

q1 Degree currently trying to obtain

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Associate's	1	3.6	3.6	3.6
	Bachelor's	7	25.0	25.0	28.6
	Both	20	71.4	71.4	100.0
	Total	28	100.0	100.0	

q2 Internship(s) completed

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	6	21.4	21.4	21.4
	1st	12	42.9	42.9	64.3
	2nd	3	10.7	10.7	75.0
	Both	7	25.0	25.0	100.0
	Total	28	100.0	100.0	

q3 Transfer status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None, didn't transfer into PLTS from anywhere	20	71.4	71.4	71.4
	Transferred in from another FSU curriculum	5	17.9	17.9	89.3
	Transferred from a college/university outside of FSU	3	10.7	10.7	100.0
	Total	28	100.0	100.0	

q4 Plans/goals

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Work	18	64.3	64.3	64.3
	Work & Education	10	35.7	35.7	100.0
	Total	28	100.0	100.0	

q4a Other specified

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		26	92.9	92.9	92.9
	I want to work in the industry, but my goal in life is to one day come back to Big Rapids and teach in the Rubber Program.	1	3.6	3.6	96.4
	Make as much money as I possibly can!!	1	3.6	3.6	100.0
	Total	28	100.0	100.0	

q5 Aware of placement data/avg starting salaries

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	1	3.6	3.6	3.6
	Placement data only	2	7.1	7.1	10.7
	Average starting salaries only	2	7.1	7.1	17.9
	Both	23	82.1	82.1	100.0
	Total	28	100.0	100.0	

q5a Other specified

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		27	96.4	96.4	96.4
	Very good placement and salary for plastic engineers	1	3.6	3.6	100.0
	Total	28	100.0	100.0	

q6 Parents aware of placement data/avg starting salaries

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	8	28.6	28.6	28.6
	Average starting salaries only	2	7.1	7.1	35.7
	Both	18	64.3	64.3	100.0
	Total	28	100.0	100.0	

q6a Other specified

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		27	96.4	96.4	96.4
	all they cared about	1	3.6	3.6	100.0
	Total	28	100.0	100.0	

q7a PPET100: Survey of Plastics & Elastomer Technology

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Haven't Taken Yet	3	10.7	10.7	10.7
	Somewhat Relevant	4	14.3	14.3	25.0
	Very Relevant	21	75.0	75.0	100.0
	Total	28	100.0	100.0	

q7b PPET115: Plastics Product Manufacturing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Haven't Taken Yet	4	14.3	14.3	14.3
	Somewhat Relevant	3	10.7	10.7	25.0
	Very Relevant	21	75.0	75.0	100.0
	Total	28	100.0	100.0	

q7c PPET120: Plastics & Polymer Material Selection 1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Haven't Taken Yet	5	17.9	17.9	17.9
	Somewhat Relevant	5	17.9	17.9	35.7
	Very Relevant	18	64.3	64.3	100.0
	Total	28	100.0	100.0	

q7d PPET127: Intro to Processing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Haven't Taken Yet	5	17.9	17.9	17.9
	Somewhat Relevant	1	3.6	3.6	21.4
	Very Relevant	22	78.6	78.6	100.0
	Total	28	100.0	100.0	

q7e PPET211: Intro to Injection Molding

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Haven't Taken Yet	16	57.1	57.1	57.1
	Very Relevant	12	42.9	42.9	100.0
	Total	28	100.0	100.0	

q7f PPET212: Plastics Product & Tool Design 1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Haven't Taken Yet	19	67.9	67.9	67.9
	Somewhat Relevant	1	3.6	3.6	71.4
	Very Relevant	8	28.6	28.6	100.0
	Total	28	100.0	100.0	

q7g PPET223: Plastics Testing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Haven't Taken Yet	18	64.3	64.3	64.3
	Not Relevant	1	3.6	3.6	67.9
	Somewhat Relevant	3	10.7	10.7	78.6
	Very Relevant	6	21.4	21.4	100.0
	Total	28	100.0	100.0	

q7h PLTS300: Plastics Engineering Management

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Haven't Taken Yet	23	82.1	82.1	82.1
	Not Relevant	1	3.6	3.6	85.7
	Very Relevant	4	14.3	14.3	100.0
	Total	28	100.0	100.0	

q7i PLTS312: Plastics Product & Tool Design 2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Haven't Taken Yet	21	75.0	75.0	75.0
	Not Relevant	1	3.6	3.6	78.6
	Somewhat Relevant	1	3.6	3.6	82.1
	Very Relevant	5	17.9	17.9	100.0
	Total	28	100.0	100.0	

q7j PLTS320: Plastics & Elastic Materials

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Haven't Taken Yet	22	78.6	78.6	78.6
	Very Relevant	6	21.4	21.4	100.0
	Total	28	100.0	100.0	

q7k PLTS321: Advanced Injection Molding

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Haven't Taken Yet	24	85.7	85.7	85.7
	Very Relevant	4	14.3	14.3	100.0
	Total	28	100.0	100.0	

q7l PLTS410: Plastics Costing, Packaging & Economics

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Haven't Taken Yet	24	85.7	85.7	85.7
	Not Relevant	1	3.6	3.6	89.3
	Somewhat Relevant	1	3.6	3.6	92.9
	Very Relevant	2	7.1	7.1	100.0
	Total	28	100.0	100.0	

q7m PLTS411: Plastics Decorating & Assembly

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Haven't Taken Yet	25	89.3	89.3	89.3
	Somewhat Relevant	1	3.6	3.6	92.9
	Very Relevant	2	7.1	7.1	100.0
	Total	28	100.0	100.0	

q7n PLTS499: Plastics Career Skills

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Haven't Taken Yet	24	85.7	85.7	85.7
	Somewhat Relevant	1	3.6	3.6	89.3
	Very Relevant	3	10.7	10.7	100.0
	Total	28	100.0	100.0	

q7o PPETXXX: Additional Plastics Electives that have been offered

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Haven't Taken Yet	20	71.4	71.4	71.4
	Somewhat Relevant	5	17.9	17.9	89.3
	Very Relevant	3	10.7	10.7	100.0
	Total	28	100.0	100.0	

q8a PPET100: Survey of Plastics & Elastomer Technology

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Haven't Taken Yet	3	10.7	11.5	11.5
	Should Not Be In	1	3.6	3.8	15.4
	Not Core, but Technical Elective	1	3.6	3.8	19.2
	Not Vital, but Core	4	14.3	15.4	34.6
	Essential	17	60.7	65.4	100.0
	Total	26	92.9	100.0	
Missing	System	2	7.1		
Total		28	100.0		

q8b PPET115: Plastics Product Manufacturing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Haven't Taken Yet	4	14.3	14.8	14.8
	Should Not Be In	1	3.6	3.7	18.5
	Not Core, but Technical Elective	1	3.6	3.7	22.2
	Not Vital, but Core	3	10.7	11.1	33.3
	Essential	18	64.3	66.7	100.0
	Total	27	96.4	100.0	
Missing	System	1	3.6		
Total		28	100.0		

q8c PPET120: Plastics & Polymer Material Selection 1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Haven't Taken Yet	4	14.3	14.3	14.3
	Should Not Be In	1	3.6	3.6	17.9
	Not Vital, but Core	4	14.3	14.3	32.1
	Essential	19	67.9	67.9	100.0
	Total	28	100.0	100.0	

q8d PPET127: Intro to Processing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Haven't Taken Yet	4	14.3	14.3	14.3
	Not Vital, but Core	2	7.1	7.1	21.4
	Essential	22	78.6	78.6	100.0
	Total	28	100.0	100.0	

q8e PPET211: Intro to Injection Molding

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Haven't Taken Yet	13	46.4	46.4	46.4
	Not Vital, but Core	1	3.6	3.6	50.0
	Essential	14	50.0	50.0	100.0
	Total	28	100.0	100.0	

q8f PPET212: Plastics Product & Tool Design 1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Haven't Taken Yet	14	50.0	50.0	50.0
	Not Core, but Technical Elective	1	3.6	3.6	53.6
	Not Vital, but Core	2	7.1	7.1	60.7
	Essential	11	39.3	39.3	100.0
	Total	28	100.0	100.0	

q8g PPET223: Plastics Testing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Haven't Taken Yet	15	53.6	53.6	53.6
	Should Not Be In	1	3.6	3.6	57.1
	Not Core, but Technical Elective	1	3.6	3.6	60.7
	Not Vital, but Core	7	25.0	25.0	85.7
	Essential	4	14.3	14.3	100.0
	Total	28	100.0	100.0	

q8h PLTS300: Plastics Engineering Management

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Haven't Taken Yet	19	67.9	67.9	67.9
	Not Core, but Technical Elective	1	3.6	3.6	71.4
	Not Vital, but Core	4	14.3	14.3	85.7
	Essential	4	14.3	14.3	100.0
	Total	28	100.0	100.0	

q8i PLTS312: Plastics Product & Tool Design 2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Haven't Taken Yet	18	64.3	64.3	64.3
	Not Core, but Technical Elective	1	3.6	3.6	67.9
	Not Vital, but Core	2	7.1	7.1	75.0
	Essential	7	25.0	25.0	100.0
	Total	28	100.0	100.0	

q8j PLTS320: Plastics & Elastic Materials

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Haven't Taken Yet	19	67.9	67.9	67.9
	Essential	9	32.1	32.1	100.0
	Total	28	100.0	100.0	

q8k PLTS321: Advanced Injection Molding

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Haven't Taken Yet	20	71.4	71.4	71.4
	Not Core, but Technical Elective	2	7.1	7.1	78.6
	Essential	6	21.4	21.4	100.0
	Total	28	100.0	100.0	

q8l PLTS410: Plastics Costing, Packaging & Economics

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Haven't Taken Yet	19	67.9	67.9	67.9
	Should Not Be In	1	3.6	3.6	71.4
	Not Core, but Technical Elective	2	7.1	7.1	78.6
	Not Vital, but Core	3	10.7	10.7	89.3
	Essential	3	10.7	10.7	100.0
	Total	28	100.0	100.0	

q8m PLTS411: Plastics Decorating & Assembly

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Haven't Taken Yet	22	78.6	78.6	78.6
	Not Core, but Technical Elective	3	10.7	10.7	89.3
	Not Vital, but Core	1	3.6	3.6	92.9
	Essential	2	7.1	7.1	100.0
	Total	28	100.0	100.0	

q8n PLTS499: Plastics Career Skills

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Haven't Taken Yet	20	71.4	71.4	71.4
	Not Core, but Technical Elective	2	7.1	7.1	78.6
	Not Vital, but Core	3	10.7	10.7	89.3
	Essential	3	10.7	10.7	100.0
	Total	28	100.0	100.0	

q8o PPETXXX: Additional Plastics Electives

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Haven't Taken Yet	18	64.3	64.3	64.3
	Not Core, but Technical Elective	5	17.9	17.9	82.1
	Not Vital, but Core	2	7.1	7.1	89.3
	Essential	3	10.7	10.7	100.0
	Total	28	100.0	100.0	

q9 Level of satisfaction with training/education received

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Dissatisfied	1	3.6	3.7	3.7
	Somewhat Satisfied	7	25.0	25.9	29.6
	Very Satisfied	19	67.9	70.4	100.0
	Total	27	96.4	100.0	
Missing	System	1	3.6		
Total		28	100.0		

q10 How well courses structured to develop skills

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Relevant skill sets are taught but not fully mastered	18	64.3	66.7	66.7
	Highly relevant skill sets are mastered	9	32.1	33.3	100.0
	Total	27	96.4	100.0	
Missing	System	1	3.6		
Total		28	100.0		

q11 How necessary are lab experiences

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Provides nice augmentation for skill set development	13	46.4	48.1	48.1
	Indispensable to developing skill sets	14	50.0	51.9	100.0
	Total	27	96.4	100.0	
Missing	System	1	3.6		
Total		28	100.0		

q12a Processing courses

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Some Principles Reinforced	1	3.6	3.8	3.8
	Most Principles Reinforced	7	25.0	26.9	30.8
	All Principles Reinforced	18	64.3	69.2	100.0
	Total	26	92.9	100.0	
Missing	System	2	7.1		
Total		28	100.0		

q12b Product & Tooling Design courses

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Essentially No Principles Reinforced	1	3.6	4.3	4.3
	Some Principles Reinforced	1	3.6	4.3	8.7
	Most Principles Reinforced	11	39.3	47.8	56.5
	All Principles Reinforced	10	35.7	43.5	100.0
	Total	23	82.1	100.0	
Missing	System	5	17.9		
Total		28	100.0		

q12c Testing course

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Essentially No Principles Reinforced	1	3.6	4.2	4.2
	Some Principles Reinforced	3	10.7	12.5	16.7
	Most Principles Reinforced	9	32.1	37.5	54.2
	All Principles Reinforced	11	39.3	45.8	100.0
	Total	24	85.7	100.0	
Missing	System	4	14.3		
Total		28	100.0		

q12d Plastics Engineering Management course

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Essentially No Principles Reinforced	1	3.6	4.2	4.2
	Some Principles Reinforced	4	14.3	16.7	20.8
	Most Principles Reinforced	12	42.9	50.0	70.8
	All Principles Reinforced	7	25.0	29.2	100.0
	Total	24	85.7	100.0	
Missing	System	4	14.3		
Total		28	100.0		

q12e Plastics Decorating & Assembly course

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Some Principles Reinforced	3	10.7	12.5	12.5
	Most Principles Reinforced	13	46.4	54.2	66.7
	All Principles Reinforced	8	28.6	33.3	100.0
	Total	24	85.7	100.0	
Missing	System	4	14.3		
Total		28	100.0		

q13 Consistency of Plastics material course to course

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat inconsistent (makes some material confusing)	1	3.6	3.8	3.8
	Somewhat consistent (noticeable, but no effect on comprehension of course material)	13	46.4	50.0	53.8
	Very consistent	12	42.9	46.2	100.0
	Total	26	92.9	100.0	
Missing	System	2	7.1		
Total		28	100.0		

q14 How closely Plastics courses related to each other

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat related	8	28.6	30.8	30.8
	Highly related	18	64.3	69.2	100.0
	Total	26	92.9	100.0	
Missing	System	2	7.1		
Total		28	100.0		

q15 Feelings about current student/teacher ratio

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Too many students	11	39.3	42.3	42.3
	Too few students	1	3.6	3.8	46.2
	Optimal ratio	14	50.0	53.8	100.0
	Total	26	92.9	100.0	
Missing	System	2	7.1		
Total		28	100.0		

q16a Testing Lab (PPET223)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Outdated	1	3.6	4.3	4.3
	Somewhat Outdated	10	35.7	43.5	47.8
	Up-to-Date	12	42.9	52.2	100.0
	Total	23	82.1	100.0	
Missing	System	5	17.9		
Total		28	100.0		

q16b Tooling Lab

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Outdated	1	3.6	4.3	4.3
	Somewhat Outdated	9	32.1	39.1	43.5
	Up-to-Date	13	46.4	56.5	100.0
	Total	23	82.1	100.0	
Missing	System	5	17.9		
Total		28	100.0		

q16c CAD & flow analysis software

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Outdated	1	3.6	4.2	4.2
	Somewhat Outdated	3	10.7	12.5	16.7
	Up-to-Date	16	57.1	66.7	83.3
	State-of-the-Art	4	14.3	16.7	100.0
	Total	24	85.7	100.0	
Missing	System	4	14.3		
Total		28	100.0		

q16d Processing Labs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Outdated	5	17.9	19.2	19.2
	Up-to-Date	18	64.3	69.2	88.5
	State-of-the-Art	3	10.7	11.5	100.0
	Total	26	92.9	100.0	
Missing	System	2	7.1		
Total		28	100.0		

q16e Decorating & Assembly Labs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Outdated	9	32.1	40.9	40.9
	Up-to-Date	12	42.9	54.5	95.5
	State-of-the-Art	1	3.6	4.5	100.0
	Total	22	78.6	100.0	
Missing	System	6	21.4		
Total		28	100.0		

q16f Project Management software

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Outdated	3	10.7	14.3	14.3
	Up-to-Date	16	57.1	76.2	90.5
	State-of-the-Art	2	7.1	9.5	100.0
	Total	21	75.0	100.0	
Missing	System	7	25.0		
Total		28	100.0		

q17a Instructors well qualified for respective courses

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Agree	7	25.0	25.9	25.9
	Strongly Agree	20	71.4	74.1	100.0
	Total	27	96.4	100.0	
Missing	System	1	3.6		
Total		28	100.0		

q17b Course content consistent with what I need to learn

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	1	3.6	3.7	3.7
	Somewhat Agree	10	35.7	37.0	40.7
	Strongly Agree	16	57.1	59.3	100.0
	Total	27	96.4	100.0	
Missing	System	1	3.6		
Total		28	100.0		

q17c Represents good value for my money

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Agree	12	42.9	44.4	44.4
	Strongly Agree	15	53.6	55.6	100.0
	Total	27	96.4	100.0	
Missing	System	1	3.6		
Total		28	100.0		

q17d Course content is in line with my needs/interests

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	1	3.6	3.7	3.7
	Somewhat Agree	12	42.9	44.4	48.1
	Strongly Agree	14	50.0	51.9	100.0
	Total	27	96.4	100.0	
Missing	System	1	3.6		
Total		28	100.0		

q17e Enough workstations in the lab

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	3	10.7	11.1	11.1
	Somewhat Agree	10	35.7	37.0	48.1
	Strongly Agree	14	50.0	51.9	100.0
	Total	27	96.4	100.0	
Missing	System	1	3.6		
Total		28	100.0		

q17f Feel safe when working in the non-computer labs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Agree	5	17.9	18.5	18.5
	Strongly Agree	22	78.6	81.5	100.0
	Total	27	96.4	100.0	
Missing	System	1	3.6		
Total		28	100.0		

q17g Lab equipment in testing labs is well-maintained

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	2	7.1	7.7	7.7
	Somewhat Agree	12	42.9	46.2	53.8
	Strongly Agree	12	42.9	46.2	100.0
	Total	26	92.9	100.0	
Missing	System	2	7.1		
Total		28	100.0		

q17h Lab equipment in decorating & assembly labs is well-maintained

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Agree	15	53.6	62.5	62.5
	Strongly Agree	9	32.1	37.5	100.0
	Total	24	85.7	100.0	
Missing	System	4	14.3		
Total		28	100.0		

q17i Lab equipment in computer labs is well-maintained

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	2	7.1	7.7	7.7
	Somewhat Agree	14	50.0	53.8	61.5
	Strongly Agree	10	35.7	38.5	100.0
	Total	26	92.9	100.0	
Missing	System	2	7.1		
Total		28	100.0		

q17j Internship experience(s) was/were valuable

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	1	3.6	3.7	3.7
	Somewhat Agree	5	17.9	18.5	22.2
	Strongly Agree	21	75.0	77.8	100.0
	Total	27	96.4	100.0	
Missing	System	1	3.6		
Total		28	100.0		

q17k My advisor has been valuable in guiding my choices

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	1	3.6	3.7	3.7
	Somewhat Agree	10	35.7	37.0	40.7
	Strongly Agree	16	57.1	59.3	100.0
	Total	27	96.4	100.0	
Missing	System	1	3.6		
Total		28	100.0		

q17l Made right choice selecting Plastics

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Agree	4	14.3	14.8	14.8
	Strongly Agree	23	82.1	85.2	100.0
	Total	27	96.4	100.0	
Missing	System	1	3.6		
Total		28	100.0		

q17m Comfortable recommending Plastics to others

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Agree	3	10.7	11.5	11.5
	Strongly Agree	23	82.1	88.5	100.0
	Total	26	92.9	100.0	
Missing	System	2	7.1		
Total		28	100.0		

q18 Where attend school/working after graduation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		4	14.3	14.3	14.3
	Appartments next year UPS.	1	3.6	3.6	17.9
	Don't know yet.	2	7.1	7.1	25.0
	Either getting a Masters from MSU or going straight into the work field.	1	3.6	3.6	28.6
	Hopefully, Rockbestos Surprenant Cable Corporation in East Granby Connecticut.	1	3.6	3.6	32.1
	I am hoping to work within the Gemini Group	1	3.6	3.6	35.7
	I don't know yet.	1	3.6	3.6	39.3
	I dont know yet.	1	3.6	3.6	42.9
	I hope to be working at a Gentex or Royal Technologies after my graduation.	1	3.6	3.6	46.4
	I hope to land a job after graduation in west Michigan	1	3.6	3.6	50.0
	I plan to make a living in the rubber industry on the west coast	1	3.6	3.6	53.6
	I will be working at Nike IHM in Oregon after graduation	1	3.6	3.6	57.1
	Maybe attending UMass Lowell to pursue master's degree.	1	3.6	3.6	60.7
	Maybe Lacks	1	3.6	3.6	64.3
	N/A Junior, but work not school.	1	3.6	3.6	67.9
	No idea thus far.	1	3.6	3.6	71.4
	No idea yet	1	3.6	3.6	75.0
	not graduated yet	1	3.6	3.6	78.6
	Only going into my sophomore year, so I do not know yet.	1	3.6	3.6	82.1
	Somewhere in the greater Grand Rapids area	1	3.6	3.6	85.7
	Undecided	1	3.6	3.6	89.3
	Undetermined.	1	3.6	3.6	92.9
	Unknown	1	3.6	3.6	96.4
	Unsure	1	3.6	3.6	100.0
	Total	28	100.0	100.0	

q19 Why select Plastics as major

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		2	7.1	7.1	7.1
	100% placement; great place to start stable career.	1	3.6	3.6	10.7
	A recruiter explained the program in detail to me and I liked what I heard.	1	3.6	3.6	14.3
	After spending a year in CDTD, I realized that PPET offered the most options and was in line with what I wanted to do.	1	3.6	3.6	17.9
	because I heard it was a great major with great opportunities	1	3.6	3.6	21.4
	CARE course offered my freshman year in the Undecided University College Program. The course was set out for students to be able sit in a classroom like atmosphere and research degrees that interested them. The professor was an advisor at Ferris so you were able to sit down with them personally and talk about all the different degrees pros n cons.	1	3.6	3.6	25.0
	Found it interesting.	1	3.6	3.6	28.6
	I chose the Plastics Engineering Technology program as my major because it was something that I was interested in. I have seen the industry and the many capabilities of plastics and I decided that it was the best route to take. Plastics is involved in every industry in the world and that is hard to say with any other major. Also from previously talking to process engineers and other engineers, I knew that Plastics Engineering was the right degree for me.	1	3.6	3.6	32.1
	I had experience in tooling and machining, as well as the atmosphere of a shop as a whole.	1	3.6	3.6	35.7
	I have worked in the industry before deciding to pursue my degree and I know what opportunities are out there for plastics graduates.	1	3.6	3.6	39.3
	I heard lots of good things about the program from family friends, and job prospects were encouraging	1	3.6	3.6	42.9
	I knew I wanted to go in to an engineering type degree and I had friends that were older than me that were in the program and they recommended it.	1	3.6	3.6	46.4
	I like chemistry but also like to do hands on jobs and I thought this had a perfect mix of both of those.	1	3.6	3.6	50.0
	I wanted to go into engineering and liked the labs and material taught.	1	3.6	3.6	53.6
	I wanted to go to school for something with good job placement and a good salary.	1	3.6	3.6	57.1
	I wanted to work local and make good money. Also family ties to plastic business	1	3.6	3.6	60.7
	I was interested in a degree in engineering, and the plastics program has great placement after graduation and seemed more appealing to me than the other engineering majors.	1	3.6	3.6	64.3
	It seemed like a good starting place.	1	3.6	3.6	67.9
	It was a great fit for me.	1	3.6	3.6	71.4
	It was recommended to me.	1	3.6	3.6	75.0
	Job placement rate and salary	1	3.6	3.6	78.6
	Pay, job placement, lack of plastic engineers, ability to work with my hands, VERY close nit community within the FSU plastics program	1	3.6	3.6	82.1

q19 Why select Plastics as major

		Frequency	Percent	Valid Percent	Cumulative Percent
	Positive referals from previous graduates of the program, and it is a growing industry with a high starting salary.	1	3.6	3.6	85.7
	The teacher to student ratio, the labs for real-life application, and the job placement/satisfaction.	1	3.6	3.6	89.3
	To make good money	1	3.6	3.6	92.9
	Too piss off my mother, she wanted me to attend Michigan State University to major in Materials Engineering, and she was trying to force it on me so completly that I went to Ferris just to state my independece as a 17 year old "man". After I got to Ferris it turned out that I had chosen Ferris because I like hands-on learning and the combonation of focus on both the science aspect of the plastics industry as well as the business side. That combo has forced me to become both intelectual and socialble in the feild.	1	3.6	3.6	96.4
	When I toured FSU I fell in love.	1	3.6	3.6	100.0
	Total	28	100.0	100.0	

q20 Specifically, what helped you choose

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		4	14.3	14.3	14.3
	A campus visit	1	3.6	3.6	17.9
	A recruiter.	1	3.6	3.6	21.4
	A showcase of it in 10th grade.	1	3.6	3.6	25.0
	After researching and reading all about the program, I talked to my advisor, my mother, and then went an gave Professor Spiers a visit. He showed me the ways of the program and all the benefits that this degree offers. I fully decided to go to Rubber after my first semester in Plastics. This is because I loved the unknown of it and the way it is always growing and things are never the same. There are so many different routes to take in the rubber industry and thats what drew me in. After being in the program for a few years, I have grown a passion for this industry and a love for the program. It has brought me so much happiness and sense of confidence, that one day I would like to be part of this Elite group of Professors that make this program what it is today.	1	3.6	3.6	28.6
	Another plastics student	1	3.6	3.6	32.1
	Co-workers who graduated from the Plastics program at Ferris recommended that I pursue a degree to open more opportunities.	1	3.6	3.6	35.7
	High school teacher at Coopersville.	1	3.6	3.6	39.3
	I had a few other schools in mind, but didn't know what major I would pick at the other schools. I had decided I would do plastics at FSU and it was a gut feeling decision.	1	3.6	3.6	42.9

q20 Specifically, what helped you choose

		Frequency	Percent	Valid Percent	Cumulative Percent
	I liked how hands on the program was and how involved you get with the actual processing. The curriculum is not only theory based learning.	1	3.6	3.6	46.4
	I made the final choice.	1	3.6	3.6	50.0
	I went on a tour of the facilities and talked to the professors one on one before choosing the Ferris Plastics program. The staff and the facilities exceeded my expectations and I felt that it was the best learning environment for that program.	1	3.6	3.6	53.6
	It fits the way that I learn.	1	3.6	3.6	57.1
	It was interesting to me, and not too many people do it. I was told it was a good program.	1	3.6	3.6	60.7
	It was recommended by a friend and the campus visit	1	3.6	3.6	64.3
	Larry Schult played a huge role in conviencing me to join the program.	1	3.6	3.6	67.9
	life	1	3.6	3.6	71.4
	Multiple associates are enrolled within the course and they all enjoy it very much.	1	3.6	3.6	75.0
	Parents	1	3.6	3.6	78.6
	Pay and job placement	1	3.6	3.6	82.1
	See above.	1	3.6	3.6	85.7
	The campus is close to home and I had visited it multiple times before during family events.	1	3.6	3.6	89.3
	The director of the program and a female senior who talked to me a little bit about the program.	1	3.6	3.6	92.9
	The tours that i took of the program.	1	3.6	3.6	96.4
	When I was thinking of switching programs, I talked often with my CDTD advisor (Prof. Hill) who helped point me in that direction.	1	3.6	3.6	100.0
	Total	28	100.0	100.0	

q21 Opportunities available to you

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		2	7.1	7.1	7.1
	A lot of different job titles could be meet with this degree.	1	3.6	3.6	10.7
	A lot of jobs available after graduation.	1	3.6	3.6	14.3
	A stable career with good benefits and salary.	1	3.6	3.6	17.9
	Decent paying jobs, with the ability to find work in many places.	1	3.6	3.6	21.4
	Get a lot of job opportunities	1	3.6	3.6	25.0
	Hopefully my opportunities are the same as any other plastics graduate and not hindered because of my skin color.	1	3.6	3.6	28.6
	I feel like there are an unlimited amount of opportunities available to me once I graduate. The range of jobs I can choose from is very broad, from sales to marketing to processing.	1	3.6	3.6	32.1
	I feel like with the great placement rate and wide variety of jobs you can get out of the program you can get out of graduation, you can go work for a company from medical all the way to automotive with everything in between to suite your interests.	1	3.6	3.6	35.7
	I feel that the opportunities when I graduate are endless. From seeing the various jobs as an intern and how a first year intern was in such high demand really showed me that this is a highly desired degree.	1	3.6	3.6	39.3
	I feel that this is a well known program that will helped me get recognized wherever I go in America.	1	3.6	3.6	42.9
	I feel that when I walk across that stage and recieve my degree, I will be able to look out in the crowd and give my mother a smile. Letting her know that I have a job, I will have a job, and the only other place for my job to go...is up. This degree offers so many benefits to the students, that I am some what glad it's so low key. It gives us a sense of purpose, and the confidence to know that we are the best employees companies want...have you seen our backgrounds, three hundred and what hours of lab training?	1	3.6	3.6	46.4
	I know that there are currently many possibilities after graduation in many different aspects of the field.	1	3.6	3.6	50.0
	I will be able to have a career in the plastics facilities anywhere in the world	1	3.6	3.6	53.6
	I will have the skill set to obtain an entry level Plastics Engineering job with just about any company in the industry.	1	3.6	3.6	57.1
	Immediate job placement	1	3.6	3.6	60.7

q21 Opportunities available to you

		Frequency	Percent	Valid Percent	Cumulative Percent
	Job choice.	1	3.6	3.6	64.3
	Job or furthering my education.	1	3.6	3.6	67.9
	job security	1	3.6	3.6	71.4
	Many, anything I want to be involved in.	1	3.6	3.6	75.0
	Money, relocating, travel	1	3.6	3.6	78.6
	Sky's the limit, depending on how well you chose to learn, and how well you chose to interview. The program should provide you with the branding, knowledge, and confidence to apply and obtain most begining level openings within the plastics related industry.	1	3.6	3.6	82.1
	so many right now	1	3.6	3.6	85.7
	The opportunities are endless.	1	3.6	3.6	89.3
	The opportunities are very wide spread. It really just depends on how comfortable you are reaching outside your comfort zone and going after the opportunities that are not normal.	1	3.6	3.6	92.9
	There are so many that I am very confident I will find the right job after graduation.	1	3.6	3.6	96.4
	There will be multiple opportunities for me.	1	3.6	3.6	100.0
	Total	28	100.0	100.0	

q22 Additional comments

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		21	75.0	75.0	75.0
	A few of these questions ask about labs or machines I haven't had and have no option to say I haven't.	1	3.6	3.6	78.6
	Do not get rid of the Rubber Program, it is more valuable then anyone could ever predict. After having two internships for rubber it is clear how old everyone in the industy really is and they make quite clear that they need people, fast!	1	3.6	3.6	82.1
	Enjoyed this quick survey.	1	3.6	3.6	85.7
	I think it would be beneficial if the school would recognize the program as one of the top majors offered at Ferris. We are well recognized in the industry and companies come looking for us. With this being said, I wish that the university would allot more money for this program. It deserves to grow and continue to thrive.	1	3.6	3.6	89.3
	N/A	1	3.6	3.6	92.9
	Plastics is generally a great program that provides students with plenty of opportunities.	1	3.6	3.6	96.4
	some check-here questions don't apply for me, being that I don't have much experience in the decoration lab, tooling lab, or project management software.	1	3.6	3.6	100.0
	Total	28	100.0	100.0	

APPENDIX C

Ferris State University
Administrative Program Review 2013
SCH's

TE
Plastics Engineering Technology
BS

Student Credit Hours - On-Campus, Off-Campus, On-Line and Total

Term		On-Campus	Off-Campus	On-Line	Total
200908	Freshman	0	0	0	0
	Sophomore	0	0	0	0
	Junior	125	0	0	125
	Senior	416	0	0	416
	Masters	0	0	0	0
	1st Professional	0	0	0	0
201008	Freshman	0	0	0	0
	Sophomore	14	0	0	14
	Junior	119	0	0	119
	Senior	473	0	0	473
	Masters	0	0	0	0
	1st Professional	0	0	0	0
201108	Freshman	11	0	0	11
	Sophomore	0	0	0	0
	Junior	151	0	0	151
	Senior	518	0	0	518
	Masters	0	0	0	0
	1st Professional	0	0	0	0
201208	Freshman	0	0	0	0
	Sophomore	17	0	0	17
	Junior	169	0	0	169
	Senior	301	0	0	301
	Masters	0	0	0	0
	1st Professional	0	0	0	0
201308	Freshman	0	0	0	0
	Sophomore	0	0	0	0
	Junior	106	0	0	106
	Senior	545	0	0	545
	Masters	0	0	0	0
	1st Professional	0	0	0	0

Ferris State University
Administrative Program Review 2013
SCH's

TE
Plastics Technology
AAS

Student Credit Hours - On-Campus, Off-Campus, On-Line and Total

Term		On-Campus	Off-Campus	On-Line	Total
200908	Freshman	235	0	0	235
	Sophomore	378	0	0	378
	Junior	170	0	0	170
	Senior	54	0	0	54
	Masters	0	0	0	0
	1st Professional	0	0	0	0
201008	Freshman	216	0	0	216
	Sophomore	273	0	0	273
	Junior	167	0	0	167
	Senior	52	0	0	52
	Masters	0	0	0	0
	1st Professional	0	0	0	0
201108	Freshman	60	0	0	60
	Sophomore	200	0	0	200
	Junior	76	0	0	76
	Senior	44	0	0	44
	Masters	0	0	0	0
	1st Professional	0	0	0	0
201208	Freshman	16	0	0	16
	Sophomore	39	0	0	39
	Junior	44	0	0	44
	Senior	53	0	0	53
	Masters	0	0	0	0
	1st Professional	0	0	0	0
201308	Freshman	0	0	0	0
	Sophomore	32	0	0	32
	Junior	27	0	0	27
	Senior	0	0	0	0
	Masters	0	0	0	0
	1st Professional	0	0	0	0

Ferris State University
Administrative Program Review 2013
SCH's

TE
Plastics/Polymer Eng Tech
AAS

Student Credit Hours - On-Campus, Off-Campus, On-Line and Total

Term		On-Campus	Off-Campus	On-Line	Total
200908	Freshman	0	0	0	0
	Sophomore	0	0	0	0
	Junior	0	0	0	0
	Senior	0	0	0	0
	Masters	0	0	0	0
	1st Professional	0	0	0	0
201008	Freshman	0	0	0	0
	Sophomore	0	0	0	0
	Junior	0	0	0	0
	Senior	0	0	0	0
	Masters	0	0	0	0
	1st Professional	0	0	0	0
201108	Freshman	240	0	0	240
	Sophomore	63	0	0	63
	Junior	45	0	0	45
	Senior	31	0	0	31
	Masters	0	0	0	0
	1st Professional	0	0	0	0
201208	Freshman	302	0	0	302
	Sophomore	380	0	0	380
	Junior	125	0	0	125
	Senior	60	0	0	60
	Masters	0	0	0	0
	1st Professional	0	0	0	0
201308	Freshman	608	0	0	608
	Sophomore	414	0	0	414
	Junior	253	0	0	253
	Senior	59	0	0	59
	Masters	0	0	0	0
	1st Professional	0	0	0	0

Ferris State University
Administrative Program Review 2013
SCH's

TE
Pre-Plastics Engineering Technology
BS

Student Credit Hours - On-Campus, Off-Campus, On-Line and Total

Term		On-Campus	Off-Campus	On-Line	Total
200908	Freshman	0	0	0	0
	Sophomore	0	0	0	0
	Junior	0	0	0	0
	Senior	79	0	0	79
	Masters	0	0	0	0
	1st Professional	0	0	0	0
201008	Freshman	0	0	0	0
	Sophomore	0	0	0	0
	Junior	0	0	0	0
	Senior	105	0	0	105
	Masters	0	0	0	0
	1st Professional	0	0	0	0
201108	Freshman	0	0	0	0
	Sophomore	0	0	0	0
	Junior	15	0	0	15
	Senior	34	0	0	34
	Masters	0	0	0	0
	1st Professional	0	0	0	0
201208	Freshman	0	0	0	0
	Sophomore	0	0	0	0
	Junior	28	0	0	28
	Senior	34	0	0	34
	Masters	0	0	0	0
	1st Professional	0	0	0	0
201308	Freshman	0	0	0	0
	Sophomore	0	0	0	0
	Junior	0	0	0	0
	Senior	27	0	0	27
	Masters	0	0	0	0
	1st Professional	0	0	0	0

Ferris State University
Administrative Program Review 2013
SCH's

TE
Pre-Plastics Polymer Eng Tech
AAS

Student Credit Hours - On-Campus, Off-Campus, On-Line and Total

Term		On-Campus	Off-Campus	On-Line	Total
200908	Freshman	0	0	0	0
	Sophomore	0	0	0	0
	Junior	0	0	0	0
	Senior	0	0	0	0
	Masters	0	0	0	0
	1st Professional	0	0	0	0
201008	Freshman	0	0	0	0
	Sophomore	0	0	0	0
	Junior	0	0	0	0
	Senior	0	0	0	0
	Masters	0	0	0	0
	1st Professional	0	0	0	0
201108	Freshman	14	0	0	14
	Sophomore	12	0	0	12
	Junior	0	0	0	0
	Senior	0	0	0	0
	Masters	0	0	0	0
	1st Professional	0	0	0	0
201208	Freshman	0	0	0	0
	Sophomore	0	0	0	0
	Junior	12	0	0	12
	Senior	0	0	0	0
	Masters	0	0	0	0
	1st Professional	0	0	0	0
201308	Freshman	109	0	0	109
	Sophomore	0	0	0	0
	Junior	0	0	0	0
	Senior	0	0	0	0
	Masters	0	0	0	0
	1st Professional	0	0	0	0

Ferris State University
Administrative Program Review 2013
SCH's

TE
Pre-Plastics Technology
AAS

Student Credit Hours - On-Campus, Off-Campus, On-Line and Total

Term		On-Campus	Off-Campus	On-Line	Total
200908	Freshman	30	0	0	30
	Sophomore	15	0	0	15
	Junior	29	0	0	29
	Senior	0	0	0	0
	Masters	0	0	0	0
	1st Professional	0	0	0	0
201008	Freshman	0	0	0	0
	Sophomore	31	0	0	31
	Junior	13	0	0	13
	Senior	0	0	0	0
	Masters	0	0	0	0
	1st Professional	0	0	0	0
201108	Freshman	0	0	0	0
	Sophomore	0	0	0	0
	Junior	0	0	0	0
	Senior	0	0	0	0
	Masters	0	0	0	0
	1st Professional	0	0	0	0
201208	Freshman	0	0	0	0
	Sophomore	0	0	0	0
	Junior	0	0	0	0
	Senior	0	0	0	0
	Masters	0	0	0	0
	1st Professional	0	0	0	0
201308	Freshman	0	0	0	0
	Sophomore	0	0	0	0
	Junior	0	0	0	0
	Senior	0	0	0	0
	Masters	0	0	0	0
	1st Professional	0	0	0	0

Ferris State University
Administrative Program Review 2013
Graduates

TE
Plastics Engineering Tech
BS

Graduate Headcount

Academic Year	On-Campus	Off-Campus	On-Line	Total
2008-2009	31	0	0	31
2009-2010	21	0	0	21
2010-2011	24	0	0	24
2011-2012	30	0	0	30
2012-2013	26	0	0	26

Ferris State University
Administrative Program Review 2013
Graduates

TE
Plastics Technology
AAS

Graduate Headcount

Academic Year	On-Campus	Off-Campus	On-Line	Total
2008-2009	28	0	0	28
2009-2010	19	0	0	19
2010-2011	30	0	0	30
2011-2012	15	0	0	15
2012-2013	7	0	0	7

Ferris State University
Administrative Program Review 2013
Graduates

TE
Plastics/Polymer Eng Tech
AAS

Graduate Headcount

Academic Year	On-Campus	Off-Campus	On-Line	Total
2011-2012	8	0	0	8
2012-2013	12	0	0	12

Ferris State University
Administrative Program Review 2013
Enrollment (Headcounts)

TE
Plastics Engineering Technology
BS

Enrollment (Headcounts) - On-Campus, Off-Campus, On-Line and Total

Term		On-Campus	Off-Campus	On-Line	Total
200908	Freshman	0	0	0	0
	Sophomore	0	0	0	0
	Junior	8	0	0	8
	Senior	29	0	0	29
	Masters	0	0	0	0
	1st Professional	0	0	0	0
201008	Freshman	0	0	0	0
	Sophomore	1	0	0	1
	Junior	7	0	0	7
	Senior	35	0	0	35
	Masters	0	0	0	0
	1st Professional	0	0	0	0
201108	Freshman	1	0	0	1
	Sophomore	0	0	0	0
	Junior	11	0	0	11
	Senior	35	0	0	35
	Masters	0	0	0	0
	1st Professional	0	0	0	0
201208	Freshman	0	0	0	0
	Sophomore	1	0	0	1
	Junior	12	0	0	12
	Senior	20	0	0	20
	Masters	0	0	0	0
	1st Professional	0	0	0	0
201308	Freshman	0	0	0	0
	Sophomore	0	0	0	0
	Junior	7	0	0	7
	Senior	36	0	0	36
	Masters	0	0	0	0
	1st Professional	0	0	0	0

Ferris State University
Administrative Program Review 2013
Enrollment (Headcounts)

TE
Plastics Technology
AAS

Enrollment (Headcounts) - On-Campus, Off-Campus, On-Line and Total

Term		On-Campus	Off-Campus	On-Line	Total
200908	Freshman	15	0	0	15
	Sophomore	25	0	0	25
	Junior	11	0	0	11
	Senior	4	0	0	4
	Masters	0	0	0	0
	1st Professional	0	0	0	0
201008	Freshman	15	0	0	15
	Sophomore	18	0	0	18
	Junior	12	0	0	12
	Senior	4	0	0	4
	Masters	0	0	0	0
	1st Professional	0	0	0	0
201108	Freshman	4	0	0	4
	Sophomore	13	0	0	13
	Junior	6	0	0	6
	Senior	3	0	0	3
	Masters	0	0	0	0
	1st Professional	0	0	0	0
201208	Freshman	1	0	0	1
	Sophomore	3	0	0	3
	Junior	3	0	0	3
	Senior	4	0	0	4
	Masters	0	0	0	0
	1st Professional	0	0	0	0
201308	Freshman	0	0	0	0
	Sophomore	2	0	0	2
	Junior	2	0	0	2
	Senior	0	0	0	0
	Masters	0	0	0	0
	1st Professional	0	0	0	0

Ferris State University
Administrative Program Review 2013
Enrollment (Headcounts)

TE
Plastics/Polymer Eng Tech
AAS

Enrollment (Headcounts) - On-Campus, Off-Campus, On-Line and Total

Term		On-Campus	Off-Campus	On-Line	Total
200908	Freshman	0	0	0	0
	Sophomore	0	0	0	0
	Junior	0	0	0	0
	Senior	0	0	0	0
	Masters	0	0	0	0
	1st Professional	0	0	0	0
201008	Freshman	0	0	0	0
	Sophomore	0	0	0	0
	Junior	0	0	0	0
	Senior	0	0	0	0
	Masters	0	0	0	0
	1st Professional	0	0	0	0
201108	Freshman	17	0	0	17
	Sophomore	4	0	0	4
	Junior	3	0	0	3
	Senior	2	0	0	2
	Masters	0	0	0	0
	1st Professional	0	0	0	0
201208	Freshman	21	0	0	21
	Sophomore	26	0	0	26
	Junior	8	0	0	8
	Senior	4	0	0	4
	Masters	0	0	0	0
	1st Professional	0	0	0	0
201308	Freshman	43	0	0	43
	Sophomore	29	0	0	29
	Junior	17	0	0	17
	Senior	4	0	0	4
	Masters	0	0	0	0
	1st Professional	0	0	0	0

Ferris State University
APR Graduated 2008-09 Through 2012-13
Average GPA

TE
Plastics Engineering Tech
BS

		FSU GPA	
Year	Average GPA	Min. GPA	Max. GPA
2008-2009	3.16	2.13	3.99
2009-2010	2.94	2.4	3.91
2010-2011	3.23	2.69	3.91
2011-2012	3.08	2.28	3.81
2012-2013	2.97	2.3	3.89

Ferris State University
APR Graduated 2008-09 Through 2012-13
Average GPA

TE
Plastics Technology
AAS

		FSU GPA	
Year	Average GPA	Min. GPA	Max. GPA
2008-2009	2.78	2.14	3.65
2009-2010	3.21	2.26	3.95
2010-2011	3.06	2.29	3.75
2011-2012	2.77	2.27	3.46
2012-2013	2.45	2.06	2.82

Ferris State University
APR Graduated 2008-09 Through 2012-13
Average GPA

TE
Plastics/Polymer Eng Tech
AAS

		FSU GPA	
Year	Average GPA	Min. GPA	Max. GPA
2012-2013	3.49	2.73	3.84

Ferris State University
APR Graduated 2008-09 Through 2012-13
Average ACT

TE
Plastics Engineering Tech
BS

	ACT		
Year	Average ACT	Min. ACT	Max. ACT
2008-2009	21.50	15	30
2009-2010	21.52	16	31
2010-2011	21.59	14	29
2011-2012	21.75	15	28
2012-2013	21.70	17	28

Ferris State University
APR Graduated 2008-09 Through 2012-13
Average ACT

TE
Plastics Technology
AAS

	ACT		
Year	Average ACT	Min. ACT	Max. ACT
2008-2009	20.59	15	28
2009-2010	22.25	16	30
2010-2011	23.18	18	28
2011-2012	20.17	17	24
2012-2013	19.86	15	22

Ferris State University
APR Graduated 2008-09 Through 2012-13
Average ACT

TE
Plastics/Polymer Eng Tech
AAS

	ACT		
Year	Average ACT	Min. ACT	Max. ACT
2012-2013	25.43	19	32

Ferris State University
APR 09-13 Enrollment by Residency, Age, FSU GPA, and ACT

TE
Plastics Engineering Technology
BS

	Residency				Age	FSU GPA			ACT		
Term	Blank	Resident	Midwest Compact	Non-Resident	Avg. Age	Avg. GPA	Min. GPA	Max. GPA	Avg. ACT	Min. ACT	Max. ACT
200908	0	36	1	0	22	3.13	2.26	4	21.72	14	31
201008	0	42	1	0	23	3.16	2.26	3.91	21.71	14	28
201108	0	44	1	1	23	2.96	2.22	3.81	21.44	15	26
201208	0	33	0	0	22	3.05	2.2	3.86	22.13	17	29
201308	0	43	0	0	21	3.15	2.34	3.86	23.07	18	32

Ferris State University
APR 09-13 Enrollment by Residency, Age, FSU GPA, and ACT

TE
Plastics Technology
AAS

	Residency				Age	FSU GPA			ACT		
Term	Blank	Resident	Midwest Compact	Non-Resident	Avg. Age	Avg. GPA	Min. GPA	Max. GPA	Avg. ACT	Min. ACT	Max. ACT
200908	0	53	1	1	20	2.84	1.34	3.95	22.00	16	30
201008	0	47	1	1	21	2.79	1.85	3.74	21.33	15	27
201108	0	26	0	0	21	2.90	1.98	3.87	21.00	15	27
201208	0	11	0	0	21	2.46	1.57	3.27	19.73	15	23
201308	0	4	0	0	20	2.60	2.02	3.24	20.00	19	21

Ferris State University
APR 09-13 Enrollment by Residency, Age, FSU GPA, and ACT

TE
Plastics/Polymer Eng Tech
AAS

		Residency			Age	FSU GPA			ACT		
Term	Blank	Resident	Midwest Compact	Non-Resident	Avg. Age	Avg. GPA	Min. GPA	Max. GPA	Avg. ACT	Min. ACT	Max. ACT
201108	0	24	0	2	19	3.05	2.34	3.87	24.39	16	35
201208	0	55	2	2	20	3.02	1.37	3.98	23.04	16	32
201308	0	88	4	1	20	2.96	1.72	4	22.71	15	35

Ferris State University
APR 09-13 Enrollment by Sex and Ethnicity

TE
Plastics Engineering Technology
BS

		Gender			Ethnicity								Full/Part Time	
Term	Enrolled	Male	Female	Unknown	Black	Hispanic	Native	Asian	White	Hawaiian	Multi	Foreign	Full Time	Part Time
200908	37	35	2	0	0	0	0	0	37	0	0	0	35	2
201008	43	42	1	0	0	0	0	0	43	0	0	0	39	4
201108	47	45	2	0	0	0	0	0	46	0	0	1	44	3
201208	33	31	2	1	0	0	0	1	31	0	0	0	30	3
201308	43	42	1	1	0	0	0	0	42	0	0	0	41	2

Ferris State University
APR 09-13 Enrollment by Sex and Ethnicity

TE
Plastics Technology
AAS

		Gender			Ethnicity								Full/Part Time	
Term	Enrolled	Male	Female	Unknown	Black	Hispanic	Native	Asian	White	Hawaiian	Multi	Foreign	Full Time	Part Time
200908	55	50	5	0	1	0	1	0	52	0	0	1	54	1
201008	49	46	3	0	1	0	0	0	47	0	0	1	47	2
201108	26	23	3	0	0	0	0	0	26	0	0	0	25	1
201208	11	9	2	0	0	0	0	0	11	0	0	0	10	1
201308	4	3	1	0	0	0	0	0	4	0	0	0	4	0

Ferris State University
APR 09-13 Enrollment by Sex and Ethnicity

TE
Plastics/Polymer Eng Tech
AAS

		Gender			Ethnicity								Full/Part Time	
Term	Enrolled	Male	Female	Unknown	Black	Hispanic	Native	Asian	White	Hawaiian	Multi	Foreign	Full Time	Part Time
201108	26	22	4	0	1	0	0	0	23	0	0	2	26	0
201208	59	53	6	0	1	0	0	0	55	0	1	2	57	2
201308	93	82	11	1	0	1	0	0	89	0	1	1	92	1

Ferris State University
APR 09-13 Enrollment by Sex and Ethnicity

TE
Pre-Plastics Engineering Technology
BS

		Gender			Ethnicity								Full/Part Time	
Term	Enrolled	Male	Female	Unknown	Black	Hispanic	Native	Asian	White	Hawaiian	Multi	Foreign	Full Time	Part Time
200908	7	7	0	0	0	0	0	0	7	0	0	0	5	2
201008	7	5	2	0	0	0	0	0	7	0	0	0	7	0
201108	4	2	2	0	0	0	0	0	4	0	0	0	2	2
201208	5	4	1	0	0	0	0	0	5	0	0	0	4	1
201308	2	2	0	0	0	0	0	0	2	0	0	0	2	0

Ferris State University
APR 09-13 Enrollment by Sex and Ethnicity

TE
Pre-Plastics Polymer Eng Tech
AAS

		Gender			Ethnicity								Full/Part Time	
Term	Enrolled	Male	Female	Unknown	Black	Hispanic	Native	Asian	White	Hawaiian	Multi	Foreign	Full Time	Part Time
201108	2	2	0	0	0	0	0	0	2	0	0	0	2	0
201208	1	1	0	0	0	0	0	0	1	0	0	0	1	0
201308	8	8	0	0	0	0	0	0	8	0	0	0	7	1

Ferris State University
APR 09-13 Enrollment by Sex and Ethnicity

TE
Pre-Plastics Technology
AAS

		Gender			Ethnicity								Full/Part Time	
Term	Enrolled	Male	Female	Unknown	Black	Hispanic	Native	Asian	White	Hawaiian	Multi	Foreign	Full Time	Part Time
200908	5	5	0	0	0	0	0	0	5	0	0	0	5	0
201008	3	3	0	0	0	0	0	0	3	0	0	0	3	0

Ferris State University
APR 09-13 Enrollment by Residency, Age, FSU GPA, and ACT

TE
Pre-Plastics Engineering Technology
BS

	Residency				Age	FSU GPA			ACT		
Term	Blank	Resident	Midwest Compact	Non-Resident	Avg. Age	Avg. GPA	Min. GPA	Max. GPA	Avg. ACT	Min. ACT	Max. ACT
200908	0	6	1	0	25	2.39	1.95	3.11	19.50	15	24
201008	0	6	1	0	24	2.89	2.39	3.58	21.00	17	25
201108	0	4	0	0	23	2.62	2.24	3.02	19.33	18	21
201208	0	5	0	0	24	2.41	1.94	3.11	20.25	19	22
201308	0	2	0	0	21	2.98	2.49	3.47	21.50	19	24

Ferris State University
APR 09-13 Enrollment by Residency, Age, FSU GPA, and ACT

TE
Pre-Plastics Polymer Eng Tech
AAS

	Residency				Age	FSU GPA			ACT		
Term	Blank	Resident	Midwest Compact	Non-Resident	Avg. Age	Avg. GPA	Min. GPA	Max. GPA	Avg. ACT	Min. ACT	Max. ACT
201108	0	2	0	0	19	2.70	2.7	2.7	23.50	21	26
201208	0	1	0	0	22	2.72	2.72	2.72	26.00	26	26
201308	0	8	0	0	18	1.70	1.7	1.7	20.63	18	25

Ferris State University
APR 09-13 Enrollment by Residency, Age, FSU GPA, and ACT

TE
Pre-Plastics Technology
AAS

	Residency				Age	FSU GPA			ACT		
Term	Blank	Resident	Midwest Compact	Non-Resident	Avg. Age	Avg. GPA	Min. GPA	Max. GPA	Avg. ACT	Min. ACT	Max. ACT
200908	0	5	0	0	19	2.90	2.64	3.15	20.40	18	25
201008	0	3	0	0	20	2.59	1.9	3.04	19.67	19	21

Ferris State University

Retention and Graduation Rates of Full-Time FTIAC Students - By Major

Two-Year Degree Programs

				Fall Term					
Entering Fall Term	**Major**	***N***		**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**
200308	RUBT	1							
			% Graduated By	0	0	100	100	100	100
			% Still Enrolled In	100	100	0	0	0	0
			% Persisters	100	100	100	100	100	100
			% Non-Persisters	0	0	0	0	0	0
200408	RUBT	4							
			% Graduated By	0	25	25	50	75	75
			% Still Enrolled In	75	75	50	25	0	0
			% Persisters	75	100	75	75	75	75
			% Non-Persisters	25	0	25	25	25	25
200508	RUBT	1							
			% Graduated By	0	0	0	100	100	100
			% Still Enrolled In	100	100	100	0	0	0
			% Persisters	100	100	100	100	100	100
			% Non-Persisters	0	0	0	0	0	0
200708	RUBT	3							
			% Graduated By	0	0	33	33	100	100
			% Still Enrolled In	100	100	67	67	0	0
			% Persisters	100	100	100	100	100	100
			% Non-Persisters	0	0	0	0	0	0
200808	RUBT	2							
			% Graduated By	0	0	0	0	0	
			% Still Enrolled In	50	0	0	0	0	
			% Persisters	50	0	0	0	0	
			% Non-Persisters	50	100	100	100	100	
200908	RUBT	4							
			% Graduated By	0	25	25	25		
			% Still Enrolled In	100	75	50	50		
			% Persisters	100	100	75	75		
			% Non-Persisters	0	0	25	25		
201008	RUBT	2							
			% Graduated By	0	50	50			
			% Still Enrolled In	100	50	50			
			% Persisters	100	100	100			
			% Non-Persisters	0	0	0			

Ferris State University

Retention and Graduation Rates of Full-Time FTIAC Students - By Major

Two-Year Degree Programs

Fall Term

Entering Fall Term	Major	N		Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
201008	PPHR	222							
			% Graduated By	0	9	15			
			% Still Enrolled In	82	66	59			
			% Persisters	82	75	74			
			% Non-Persisters	18	25	26			
201108	PPHR	235							
			% Graduated By	0	14				
			% Still Enrolled In	82	60				
			% Persisters	82	74				
			% Non-Persisters	18	26				
201208	PPHR	213							
			% Graduated By	0					
			% Still Enrolled In	78					
			% Persisters	78					
			% Non-Persisters	22					

				Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
200308	PPLT	4							
			% Graduated By	0	0	0	25	25	25
			% Still Enrolled In	50	50	50	0	0	0
			% Persisters	50	50	50	25	25	25
			% Non-Persisters	50	50	50	75	75	75
200408	PPLT	2							
			% Graduated By	0	0	0	0	0	50
			% Still Enrolled In	50	50	50	50	50	0
			% Persisters	50	50	50	50	50	50
			% Non-Persisters	50	50	50	50	50	50
200508	PPLT	2							
			% Graduated By	0	0	0	0	0	0
			% Still Enrolled In	100	0	0	0	0	0
			% Persisters	100	0	0	0	0	0
			% Non-Persisters	0	100	100	100	100	100

Ferris State University

Retention and Graduation Rates of Full-Time FTIAC Students - By Major

Two-Year Degree Programs

Fall Term

Entering Fall Term	Major	N		Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
200608	PPLT	1							
			% Graduated By	0	0	0	0	100	100
			% Still Enrolled In	100	100	100	100	0	0
			% Persisters	100	100	100	100	100	100
			% Non-Persisters	0	0	0	0	0	0
200708	PPLT	1							
			% Graduated By	0	0	100	100	100	100
			% Still Enrolled In	100	100	0	0	0	0
			% Persisters	100	100	100	100	100	100
			% Non-Persisters	0	0	0	0	0	0
200808	PPLT	2							
			% Graduated By	0	0	100	100	100	
			% Still Enrolled In	100	100	0	0	0	
			% Persisters	100	100	100	100	100	
			% Non-Persisters	0	0	0	0	0	
200908	PPLT	2							
			% Graduated By	0	50	50	50		
			% Still Enrolled In	100	0	50	50		
			% Persisters	100	50	100	100		
			% Non-Persisters	0	50	0	0		
				Year 2	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**
201108	PPPE	1							
			% Graduated By	0	0				
			% Still Enrolled In	0	0				
			% Persisters	0	0				
			% Non-Persisters	100	100				
				Year 2	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**
200308	PPSY	5							
			% Graduated By	0	0	0	0	20	20
			% Still Enrolled In	40	20	20	20	0	20
			% Persisters	40	20	20	20	20	40
			% Non-Persisters	60	80	80	80	80	60

Ferris State University

Retention and Graduation Rates of Full-Time FTIAC Students - By Major

Two-Year Degree Programs

Fall Term

Entering Fall Term	Major	N		Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
200708	POPT	2							
			% Graduated By	0	0	0	0	50	50
			% Still Enrolled In	50	50	50	50	0	0
			% Persisters	50	50	50	50	50	50
			% Non-Persisters	50	50	50	50	50	50
200808	POPT	1							
			% Graduated By	0	0	0	0	0	
			% Still Enrolled In	100	0	0	0	0	
			% Persisters	100	0	0	0	0	
			% Non-Persisters	0	100	100	100	100	
201008	POPT	1							
			% Graduated By	0	0	0			
			% Still Enrolled In	100	100	100			
			% Persisters	100	100	100			
			% Non-Persisters	0	0	0			

				Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
201108	PPDG	2							
			% Graduated By	0	0				
			% Still Enrolled In	0	0				
			% Persisters	0	0				
			% Non-Persisters	100	100				

				Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
201108	PPET	17							
			% Graduated By	0	24				
			% Still Enrolled In	94	58				
			% Persisters	94	82				
			% Non-Persisters	6	18				
201208	PPET	17							
			% Graduated By	0					
			% Still Enrolled In	76					
			% Persisters	76					
			% Non-Persisters	24					

Ferris State University

Retention and Graduation Rates of Full-Time FTIAC Students - By Major

Two-Year Degree Programs

Fall Term

Entering Fall Term	Major	N		Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
200608	PPLT	1							
			% Graduated By	0	0	0	0	100	100
			% Still Enrolled In	100	100	100	100	0	0
			% Persisters	100	100	100	100	100	100
			% Non-Persisters	0	0	0	0	0	0
200708	PPLT	1							
			% Graduated By	0	0	100	100	100	100
			% Still Enrolled In	100	100	0	0	0	0
			% Persisters	100	100	100	100	100	100
			% Non-Persisters	0	0	0	0	0	0
200808	PPLT	2							
			% Graduated By	0	0	100	100	100	
			% Still Enrolled In	100	100	0	0	0	
			% Persisters	100	100	100	100	100	
			% Non-Persisters	0	0	0	0	0	
200908	PPLT	2							
			% Graduated By	0	50	50	50		
			% Still Enrolled In	100	0	50	50		
			% Persisters	100	50	100	100		
			% Non-Persisters	0	50	0	0		
				Year 2	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**
201108	PPPE	1							
			% Graduated By	0	0				
			% Still Enrolled In	0	0				
			% Persisters	0	0				
			% Non-Persisters	100	100				
				Year 2	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**
200308	PPSY	5							
			% Graduated By	0	0	0	0	20	20
			% Still Enrolled In	40	20	20	20	0	20
			% Persisters	40	20	20	20	20	40
			% Non-Persisters	60	80	80	80	80	60

Ferris State University

Retention and Graduation Rates of Full-Time FTIAC Students - By Major

Two-Year Degree Programs

Fall Term

Entering Fall Term	Major	N		Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
201008	PLAW	9							
			% Graduated By	0	0	0			
			% Still Enrolled In	44	44	22			
			% Persisters	44	44	22			
			% Non-Persisters	56	56	78			
201108	PLAW	5							
			% Graduated By	0	0				
			% Still Enrolled In	40	40				
			% Persisters	40	40				
			% Non-Persisters	60	60				
201208	PLAW	7							
			% Graduated By	0					
			% Still Enrolled In	71					
			% Persisters	71					
			% Non-Persisters	29					

Entering Fall Term	Major	N		Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
200308	PLTT	19							
			% Graduated By	0	16	47	68	68	68
			% Still Enrolled In	89	63	27	0	0	0
			% Persisters	89	79	74	68	68	68
			% Non-Persisters	11	21	26	32	32	32
200408	PLTT	17							
			% Graduated By	0	24	41	53	71	71
			% Still Enrolled In	88	58	35	23	5	5
			% Persisters	88	82	76	76	76	76
			% Non-Persisters	12	18	24	24	24	24
200508	PLTT	19							
			% Graduated By	0	32	63	68	74	79
			% Still Enrolled In	84	47	16	11	5	0
			% Persisters	84	79	79	79	79	79
			% Non-Persisters	16	21	21	21	21	21

Ferris State University

Retention and Graduation Rates of Full-Time FTIAC Students - By Major

Two-Year Degree Programs

				Fall Term					
Entering Fall Term	**Major**	***N***		**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**
200608	PLTT	11							
			% Graduated By	0	27	55	73	73	82
			% Still Enrolled In	82	55	27	9	9	0
			% Persisters	82	82	82	82	82	82
			% Non-Persisters	18	18	18	18	18	18
200708	PLTT	15							
			% Graduated By	0	33	67	80	87	87
			% Still Enrolled In	93	60	13	7	0	0
			% Persisters	93	93	80	87	87	87
			% Non-Persisters	7	7	20	13	13	13
200808	PLTT	15							
			% Graduated By	0	33	60	60	67	
			% Still Enrolled In	87	54	13	20	6	
			% Persisters	87	87	73	80	73	
			% Non-Persisters	13	13	27	20	27	
200908	PLTT	13							
			% Graduated By	0	15	62	69		
			% Still Enrolled In	92	77	30	23		
			% Persisters	92	92	92	92		
			% Non-Persisters	8	8	8	8		
201008	PLTT	12							
			% Graduated By	0	50	83			
			% Still Enrolled In	100	42	9			
			% Persisters	100	92	92			
			% Non-Persisters	0	8	8			
201108	PLTT	2							
			% Graduated By	0	0				
			% Still Enrolled In	50	50				
			% Persisters	50	50				
			% Non-Persisters	50	50				
201208	PLTT	1							
			% Graduated By	0					
			% Still Enrolled In	100					
			% Persisters	100					
			% Non-Persisters	0					

APPENDIX D - CURRICULUM VITAE

ROBERT G. SPEIRS III

EDUCATION:

MAY 1980	B.S. Plastics Engineering, University of Lowell, Lowell, MA.
SEPT. 1982	M.S. Plastics Engineering, University of Lowell
Thru 2008	Doctor of Engineering, University of Massachusetts@ Lowell (ADB)

FACULTY POSITIONS:

1981-82	Graduate Assistant, University of Lowell Plastics Engineering Dept.
1981-82	Adjunct Faculty, University of Lowell, School of Continuing Education
1988-93	Assistant Professor, Ferris State University, Plastics Engineering Technology
1993-2002	Associate Professor, Ferris State University, Plastics Engineering Technology
2002- Present	Professor, Ferris State University, Plastics Engineering Technology
2003 – Present	Department Chair, Plastics and Rubber programs.

COURSES TAUGHT (Ferris State University)

PLTS 110	Introduction to Plastics technology
PLTS 121	Plastics Processing 1
PLTS 211	Plastics Processing 2
PLTS 223	Plastics Testing and Properties
PLTS 312	Plastics Product and Tool design 2
PLTS 320	Plastics & Elastomer systems
PLTS 321	Advanced Injection molding
PLTS 342	Plastics Materials Selection
PLTS 499	Plastics Career Skills

COURSES TAUGHT (University of Massachusetts @ Lowell)

26.300	Polymeric Materials I
26.301	Polymeric Materials II
26.25/216	Plastics Processing Laboratory

INDUSTRIAL SEMINARS TAUGHT

- Introduction to Injection molding
- Advanced Injection molding
- Trouble-shooting the Injection molding process
- Plastics Materials and Testing
- Automotive Materials and testing
- Plastics materials selection
- Plastics process selection
- Automotive plastics

PROFESSIONAL EXPERIENCE:

1980-81	Market Development Engineer, Dynamit Nobel AG, Kay-Fries Chemical Div. (Plastics materials sales)
1982-85	Principle engineer, Baxter Travenol Labs, Artificial Organs Div. (Medical products)
1985-88	Senior Applications Development Engineer, Dow Chemical Co., Plastics Dept. (Plastics materials, service/design)
Jan. 2000-Aug. 2000	Plastics Consultant, NMC Group, Inc., Pomona, CA (Sabbatical leave, worked with a custom molder)

INDUSTRIAL CONSULTING:
The focus of most clients' needs are for assistance in plastics product design and development, production processes selection, analysis and automation. Materials selection as it pertains to trouble- shooting, problem identification and new product introduction. Additionally, consultation has occurred in the areas of training and education, specifically curriculum development.

INDUSTRIAL CONSULTING (partial list):
The Food and Drug Administration, Washington, D.C.
Phillips Plastics, Phillips, WI
Tri-Quest Products, Vancouver, WA
DME Corporation, Detroit, MI
Still, Neimier, Yockey & Young, Attorneys at Law, Farmington Hills, MI
Hyman, Phelps & McNamara, P.C., Attorneys at Law, Washington, D.C.
Arnold & Porter, Attorneys at Law, Washington, D.C.
Dow Corning Corp., Freeland, MI
Prince Corp., Holland, MI
United Technologies Corporation, Hartford, CT
Society of Manufacturing Engineers, Dearborn, MI
The NMC Group, Inc., Pomona, CA
Minnesota Technologies, Minneapolis, MN
Johnson and Johnson, Ethicon Div., Columbus, OH
Leer Corp., South Bend, IN
Kaiser Electronic, Inc., San Jose, CA

PUBLICATIONS:
THESIS: "RIM/RRIM: A Technology Assessment", M.S. Thesis, University of Lowell, 1982

ARTICLES: "Nylons, Amorphous": Modern Plastics Encyclopedia-1982, McGraw Hill Publications.

CHAPTERS: Problem resolution: "Plastics Technicians Toolbox", Society of Plastics Engineers, 2002

CONFERENCE PUBLICATIONS:

"*Injection Molding CIM Cooperative for Education: Pay-offs for the Plastics Industry";* P. Engelmann, R. Speirs III, R. Cedarholm. Society of Plastics Engineers-Annual National Technical Conference 1991.

"Rubber Technician/Technologist: A Skill/Task Assessment"; R. Speirs and E. Whitmore. American Chemical Society Rubber Division-Annual Conference 1991.

Development and Manufacture of Visor for Helmet Mounted Display David Krevor, Gregg McNelly, John Skubon, and Robert Speirs; ; SPIE Vol. 5180; C.E. Rash and C. E. Reese (editors); 2004

"Manufacturing development of visor for binocular Helmet Mounted Display", David Krevor, Timothy Edwards, Eric Larkin, Rockwell Collins Display Systems; John Skubon, MXL Industries, Robert Speirs, Ferris State University, Tom Sowden, Contour Metrological & Manufacturing. Proceedings of SPIE Volume: **6671.** ISBN: 9780819468192

MISCELLANEOUS: BOOK REVIEW

"Handbook of Plastics and Composites"; ASM International, 1989.

"Handbook of Plastics Testing Technology"; Shah, V., Wiley Interscience, 1998

Ferris State University

College of Technology

Yearly Resume

Academic Year: 2007/2008

Name Larry Langell Rank Associate Professor

Date of Initial Appointment: 9/97

Highest degree held (degree and date conferred):

-MS Career & Technical Education, Ferris State University, 12/00

Institutes, seminars, workshops, or field experiences:

-Moldflow Plastic Flow Analysis training, Kalamazoo MI, Fall 2004

-CATIA Software training (5-day), Ferris State University, Summer 2007

Departmental assignments/activities:

-Coordinate administration / analysis of Outcomes Assessment test to incoming PLTS freshmen, F/01-F/07

-Coordinate administration / analysis of Outcomes Assessment test to exiting PLTS sophomores, W/02-W/08

-Member FSU Library & Historical Archive committee- '02/'03, '03/'04, '05/'06, '06/'07, '07/'08 school years

-Elected as Chair, FSU Library & Historical Archive committee- '03/'04

-Develop & Maintain FSU Plastics Program website

-Integrated webpage design projects into several courses

-PLTS 121

-PLTS 312

-PLTS 411

-Integrated Solids Modeling in PLTS 212 / PLTS 312 courses

-Taught non-PLRU department class ETEC 140 for PLTS students

-Staffed COT Student Picnic- F/02-F/07

-Staffed PLRU Career Days- F/04-F/07

-Summer 2001-2007 contracts following FSU interns

Memberships in professional organizations (list office held, if any):

-SPE (Society of Plastics Engineers)

-Elected to SPE Board of Directors, Western Michigan Section Education Committee Chair

-Elected to SPE Board of Directors, Western Michigan Section Website Committee Chair

Curriculum Vitae

Gregory J. Conti
320 Tomahawk Lane
Reed City, MI 49677
(231) 832-3813 – Home Phone (231) 591-2963 – Work Phone

E d u c a t i o n

1988-
B.S. Applied Mathematics, Ferris State College

1986-
B.S. Plastics Engineering Technology, Ferris State College, Highest Distinction

1985-
AAS Pre-Engineering, Ferris State College, Highest Distinction

1985-
AAS Plastics Technology, Ferris State College, Highest Distinction

Additional Training:
1997 - Mako Controller Training
1997 - C-Mold – Flow Analysis Training
1995 - Vickers Hydraulics Training
1990 - MoldFlow – Flow Analysis Training
1990 – RJG & Associates – Scientific Injection Molding Seminars
1989 - TMC – flow Analysis Training
1989 - Personal designer CAD Training Course
1988 - RJG & Associates – Injection Molding Training Seminars
1986 - SPC and Taguchi (DOE) Training Seminars

E d u c a t i o n a l H o n o r s a n d S c h o l a r s h i p s

B.S. Applied Mathematics, Highest Distinction – 1988
Ferris State University, Big Rapids, Michigan 49677

B.S. Plastics Engineering Technology, Highest Distinction – 1986
Ferris State University, Big Rapids, Michigan 49677

AAS Pre-Engineering, Highest Distinction – 1985
Ferris State University, Big Rapids, Michigan 49677

AAS Plastics Technology, Highest Distinction – 1985
Ferris State University, Big Rapids, Michigan 49677

National Plastics Brotherhood Scholarship Award – 1984-85

Society of Plastics Engineers Scholastic Scholarship – 1985

P r o f e s s i o n a l E x p e r i e n c e

Technology Transfer Center at Ferris State **1993 - Present**
Big Rapids, MI
Trainer-
Conducted numerous training sessions in plastics processing for engineers, managers at all levels, technicians, and set-up personnel. Some locations were: Delphi at the Adrian facility; United Automotive Technologies at various North American locations including the Ferris State University plastics building; Soo Plastics at the Sault Ste Marie facility, ACS Exteriors at the East Tawas facility

Guiness Technologies, Inc. **1998 – Present**
Rockford, MI
Lead Process and Set-up Technician Trainer-
Conducted numerous training sessions in plastics processing and mold set-up for technicians, set-up personnel, engineers, and managers at all levels. Some locations were: Venture Industries, Inc.; Soo Plastics at the Sault Ste Marie facility; Donnelly at the Newago facility; Union Tools in Hebron, Ohio; Lexamar at the Boyne City facility; Delphi at the Adrian facility

Baylock Manufacturing Corp. / ITT **1986 - 1987**
Oscoda, MI
Industrial/Plant Engineer-
Supervisor over the engineering and prototype departments
Set-up work standards and procedures
Designed, conducted and analyzed various processing experiments
Conducted process capability studies
Designed and developed new processes and the associated tooling
Technical advisor to the quality circles
Established various computer systems for tracking ‘efficiences’
Established a system for production scheduling
Wrote-up FMEAs, control plans, production flow charts, etc.

Keeler Brass Company **1984 – 1986**
Grand Rapids, MI
Injection Molding Technician/ Set-up-
Set-up injection molding presses for production runs
Trouble-shot production problems

T e a c h i n g E x p e r i e n c e

Ferris State University **November 1987 – Present**
Big Rapids, Michigan 49307
Assistant Professor, Plastics Programs

Courses Taught under Quarters:
PLT 111 - Introduction to Plastics Technology
PLT 121 - Plastics Forming Processing (aka. Processing I)
PLT 131 - Physical Properties of Plastics (aka. Plastics Testing)
PLT 203 - Composites Structures
PLT 204 - Production Processes (aka. Processing II)
PLT 411 - Advanced Plastics Processes
PLT 412 - Plastics Projects I
PLT 431 - Plastics Projects II
PLT 141/341 - Internships in Plastics Technology

Courses Taught under Semesters:
PLTS 110 - Introduction to Plastics Technology
PLTS 211 - Plastics Processing #2
PLTS 223 - Plastics Testing and Properites
PLTS 321 - Plastics Processing #3
PLTS 325 - Plastics Technology for MET
PLTS 342 - Plastics Materials Selection for PDET
PLTS 193/393 - Industrial Internships

*All courses listed above include teaching both lectures and labs for every course with the obvious exceptions of the industrial internships.

C o n s u l t i n g A c t i v i t i e s

Spring of 1996

Soo Plastics
6 sessions of Process Training taught at the Sault Ste Marie facility and the local Ramada Inn and attended by all set-up, process technicians, and process and design engineers.
2 sessions on the Physical Properties and Quality Control taught at the Sault Ste Marie facility attended by all QC/QA personnel

January to September 1997
United Technologies Automotive – Interiors (North American Division)
12 session of Process Training taught at Ferris State plastics facilities and attended by process technicians, process and tooling engineers, managers and supervisors, and corporate staff
2 sessions of Process Training taught at the Iowa City facility and attended by process technicians, process engineers, managers and supervisors
1 executive session held at Ferris State University and attended by UTA president and his corporate staff

March 1998
Venture Industries
3 sessions of Injection Mold Set-up Training taught at the St. Clair facility and sttended by all mold set-up personnel along with 2 corporate trainers and some process technicians

October 1998
Union Tools – Injection Molding Division
3 sessions of Injection Mold Set-up Training taught at the Cincinnati, OH facility and attended by all mold set-up personnel along with the plant supervisor

December 1999
Donnelly Corporation
3 sessions of Process Training taught at the Newago facility and attended by all process technicians and process engineers

Summer 2000/2001
Delphi at Adrian
5 sessions of Process Training taught at the Adrian facility and attended by all process technicians and some key supervisors and process engineers and managers
1 executive session at the Adrian facility and attended by high level managers and key engineers, supervisors and union representatives

July 2001
Soo Plastics
2 sessions of Process Training taught at the Saulte Ste Marie facility and attended by all process technicians and mold set-up personnel

Summer 2001
Vitrolite
Conducted material testing and analysis of a proprietary additive for plastics processing

March 2002
ASC Exteriors
1 session of Process Training taught at the East Tawas facility and attended by all plastics process personnel

Spring/Summer 2002
Lexamar
2 sessions of Process Training taught at the Boyne City facility and attended by most plastics processing personnel and tool room personnel

Summer 2005
Lear Corp
2 sessions of Process Training taught at the Iowa City facility and attended by process technicians, process engineers, managers and supervisors

Summer 2005
Lexamar
2 sessions of Process Training taught at the Boyne City facility and attended by most plastics processing personnel and tool room personnel

Summer 2006
Delphi at Adrian
2 sessions of Process Training taught at the Adrian facility and attended by all process technicians and some key supervisors and process engineers and managers

March 2008
EverReady
1 session of Process Training taught at the St. Albans, VT facility and attended by most plastics processing personnel and tool room personnel

Professional Memberships

The Society of Plastics Engineers
Member from 1982 - 1996

Curriculum Vitae

Stephen R. Wolfer
10486 Scenic Pines Ct.
Rockford, MI 49307
(231)-591-2636 (W) (616)-863-9892 (H)

Education

Pittsburg State University
Pittsburg, Kansas
Bachelor of Science(BS) in Engineering Technology, Plastics Engineering Technology Major. *1987*

Master of Science(MS) in Technology, Plastics Major. *1988*

Specialist in Education(Ed.S.), Industrial Education Major. *2002*

Educational Honors and Scholarships

Pittsburg State University Plastics Academic
Pittsburg State University, Pittsburg, Kansas 1987.

Chicago Society of Plastics Engineers Scholastic
Pittsburg State University, Pittsburg, Kansas 1986.

Wilcox Memorial Scholarship
Pittsburg State University, Pittsburg, Kansas 1986.

84th District General Assembly Scholastic
Pittsburg State University, Pittsburg, Kansas 1985.

Professional experience

Rubbermaid Inc. **1990-1992**
Wooster, Ohio
Mold Development Leader

Responsible for coordination of process engineers, laboratory, and mold sampling activities such as setting priorities, scheduling, and consulting. Also responsible for part quality and optimized molding conditions for new molds released to production, in addition to production repairs and support.

Machine familiarity with HPM, Husky, Cincinnati, Farrell, and Van Dorn (400-3000 ton). Processing familiarity with polyethylene, polypropylene, polystyrene, ABS, and SAN.

Square D Company **1988-1990**
Columbia, Missouri
Plastics Project Engineer

Responsible for purchasing plastic equipment, sampling new and rebuilt molds and equipment, optimizing molding cycles and processing parameters, and serving a liaison with custom molders. Also initiated new thermoplastic department, training programs, cost reduction teams, and quick mold change systems.

Machine Familiarity with Bucher, Arburg, and Cincinnati (80-500 tons). Processing familiarity with phenolics, polyesters, BMC, SMC, PPO, acetal, and nylon resins.

General Dynamics **1985-1986**
Fort Worth, Texas
Research and Development Engineer

Responsible for identifying and validating innovative manufacturing and tooling techniques applicable to the fabrication of high performance thermoplastic structure and identifying and transferring technologies related to the repair of advanced composite structure.

Consumer Savings **1978-1982**
Lockport, Illinois
Supervisor

Responsible for supervising plastic processing and packaging operations.

T e a c h i n g E x p e r i e n c e

Ferris State University **1992-Present**
Big Rapids, Michigan 49307
Professor, Plastics Programs

Plastics Processing 1
This course provides basic knowledge and awareness of injection molding, thermoforming, blow molding, rotational molding, compression/transfer molding, extrusion, and ancillary equipment. Emphasis is on data collecting techniques and familiarization with the basic plastics processing techniques used in industry today.

Plastics Processing 2
This course provides the student with knowledge and experience in solving common problems encountered in operating plastic production equipment. The course relates the machine control parameters to the effects on the process and the final part quality. Emphasis is placed on primary troubleshooting, process optimization, and the application of standard quality control techniques.

Plastics Processing 3

Here students learn a theoretical approach to injection molding, blow molding, compression molding, and extrusion processing. Plastics processing is examined from a molecular perspective. Various engineering plastics are described in rheological terms of flow response to forces applied. Advanced troubleshooting and process optimization is dealt with in terms of process monitoring.

Plastics Research Project Management
Students develop project management skills through the selection of a pertinent project, writing the project proposal, and performing research. This research concerns some aspect of plastics processing and/or applications.

Senior Plastics Research Project
The student executes the previously proposed project in Plastics Research Project Management. Research, preparation of written reports, and an oral presentation of the research are required.

Capstone Project/Plastics Seminar
A series of special presentations designed to prepare the prospective plastics engineering technology graduate for entry into the plastics industry work force.

Pittsburg State University
Pittsburg, Kansas 66762
Instructional Graduate Assistant , Department of Plastics Engineering Technology
Responsible for planning, organizing, and teaching lecture and laboratory courses.

P u b l i c a t i o n s

S.R. Wolfer, "The Use of Personal Computer Spreadsheet Software in a Plastics Testing Laboratory"
Proceedings of the 46th Annual Technical Conference of the Society of Plastics Engineers, Atlanta. April 1988, paper # 620.

S.R. Wolfer, Ferris State Internship Manual
Ferris State University, December 1993.

S.R. Wolfer, "Hire an Intern and Gain an Advantage"
Injection Molding, April 1994, p. 8.

S.R. Wolfer, "Ferris State Internship Manual"
Plastics Engineering, April 1994, p. 48.

S.R. Wolfer, "Ferris State Offers Internship Manual"
Plastics Engineering, May 1994, p. 96.

S.R. Wolfer, Injection Molding Set-Up Manual
Guiness Technologies, May 1994.

S.R. Wolfer, "Injection Molding Set-Up Manual Offered"
Plastic News, October 25, 1995.

S.R. Wolfer, "Here's a Guide to Injection Machine Set-Up"
Plastics Technology, February 1995, p. 14.

S.R. Wolfer, Manual Para Moldeadores De Plastico Por Inyeccion
Guiness Technologies, Jan 1996.

S.R. Wolfer, 'Removing the Obstacles- Teaching Thermoset Processing"
Proceedings of the Thermoset Regional Technical Conference of the Society of Plastics Engineers, Research Triangle Park, NC. March 1997, p. 1-6.

Consulting activities

"Injection Molding Processing Training
Energizer Battery Corporation, St. Albans, VT, 2008
Decoma Lexamar, Boyne City, MI, 2006
Engineered Plastic Components, Grinnell, IA, 2004
Decoma Lexamar, Boyne City, MI, 2003
ASC Exteriors, East Tawas, MI, 2002
Delphi Adrian, Adrian, MI, 2001
Soo Plastics, Sault St. Marie, MI, 2000
Donnelly Corporation, Newaygo, MI, 1999

"Thermoplastic Injection Molding Set-Up Training"
Summit Polymers, Vicksburg Facility, Vicksburg, MI 1996-1997
Summit Polymers, East Facility, Portage, MI, 1996-1997
Summit Polymers, Valley Facility, Portage, MI, 1997
Summit Polymers, Sturgis Facility, Sturgis, MI, 1997
Summit Polymers, Kalamazoo Facility, Kalamazoo, MI, 1998

"Thermoset Injection Molding Training"
GMI Composites, Muskegon, MI, 1996
Bucher Inc., Buffalo Grove, IL, 1995
Cytec Industries, Perrysburg, OH, 1995

"Basic Injection Molding" Interactive CD ROM
Evart Products, Evart, MI, 1995

"Basic Injection Molds" Interactive CD ROM
Evart Products, Evart, MI, 1995

"Injection Molding" Interactive Computer Training Disks
DME Company, Detroit, MI, 1996

Site Visit and Training Assessment
United Technologies Automotive, Detroit, MI, 1996

"Basic Injection Molding Training for Operators"
Soo Plastics, Sault St. Marie, MI, 2000
United Technologies Automotive- Monterey, Mexico, 1997
United Technologies Automotive- Alma, Alma, MI, 1997

United Technologies Automotive- Edinbourg, Edinbourg, IN, 1997

Bucher National Plastics Exhibition (NPE) Sales Lead Qualification
Bucher, Inc., Buffalo Grove, IL, 1997

Bucher Machine Database
Bucher, Inc., Buffalo Grove, IL, 1997

Bucher Customer Survey
Bucher, Inc., Buffalo Grove, IL, 1997

Bucher Thermoset Injection Molding Training Program
Bucher, Inc., Buffalo Grove, IL, 1997

"Injection Mold Set-Up Training"
Venture Industries, Inc. Clinton Township, MI 1998
Union Tools, Hebron, OH, 1998

Professional memberships

The Society of Plastics Engineers
Member (on and off) since 1985.
Student Chapter Advisor, 1992-1993.
National Education Chairperson, 1993 - 1994.

The Society of Plastics Industry
Member (on and off) since 1986.

FERRIS STATE UNIVERSITY
IMAGINE MORE

PLASTICS & RUBBER APR - FACILITIES

As part of the Academic Program Review (APR) process, the Plastics & Rubber Department is asking utilizers of the Ferris State University Plastics & Rubber facilities to please take a few minutes to complete this survey. Your responses will help us evaluate the program's facilities and equipment, see where the strengths are and show us where changes need to be made. Thank you for your feedback in this important process.

Q1 Is the building name National Elastomer Center appropriate?

- ○ Yes
- ○ No
- ○ I don't know

Q2 Please indicate your level of satisfaction with the *lecture rooms*.

	Very Dissatisfied	Somewhat Dissatisfied	Somewhat Satisfied	Very Satisfied	Don't Know or Not Applicable
PC/Digital systems	○	○	○	○	○
Projection systems	○	○	○	○	○
White board	○	○	○	○	○
Room lighting	○	○	○	○	○
HVAC	○	○	○	○	○

Q3 Please indicate your level of satisfaction with the *labs*.

	Very Dissatisfied	Somewhat Dissatisfied	Somewhat Satisfied	Very Satisfied	Don't Know or Not Applicable
Equipment available	○	○	○	○	○
Equipment maintenance	○	○	○	○	○
Layout	○	○	○	○	○
Safety systems (MSDS/Lockouts/First Aid, etc.)	○	○	○	○	○
HVAC	○	○	○	○	○

Traffic (movement of people & equipment)	○	○	○	○	○
PC Digital support systems	○	○	○	○	○
Hand tool availability	○	○	○	○	○
Mold Inventory & Control Systems	○	○	○	○	○
Operable Condition of Equipment	○	○	○	○	○
Equipment is up-to-date	○	○	○	○	○
Availability of injection molds	○	○	○	○	○
Availability of non-injection molds	○	○	○	○	○
Material (resin) availability	○	○	○	○	○
Molded sample availability (test bars, etc.)	○	○	○	○	○

Q4 Please indicate your level of satisfaction with the *maintenance*.

	Very Dissatisfied	Somewhat Dissatisfied	Somewhat Satisfied	Very Satisfied	Don't Know or Not Applicable
Critical breakdowns are promptly handled	○	○	○	○	○
Preventive maintenance	○	○	○	○	○
Maintained process (identifying problems)	○	○	○	○	○
Technician availability	○	○	○	○	○
Technician skills	○	○	○	○	○
Current System in place for reporting equipment breakdowns	○	○	○	○	○

Q5 Please indicate your level of satisfaction with the *building*.

	Very Dissatisfied	Somewhat Dissatisfied	Somewhat Satisfied	Very Satisfied	Don't Know or Not Applicable
HVAC	○	○	○	○	○
Building systems (air/pressure/power)	○	○	○	○	○
Cleanliness	○	○	○	○	○
Janitorial support	○	○	○	○	○
Restroom maintenance	○	○	○	○	○

Lighting	○	○	○	○	○

Q6 I believe the top 3 issues/concerns associated with lab equipment are:

Q7 I believe the top 3 issues/concerns associated with the NEC building are:

Q8 Please use this space for additional comments/suggestions regarding any of the above.

Future Equipment & Facilities Needs

Q9 Please indicate your level of satisfaction with the following:

	Very Dissatisfied	Somewhat Dissatisfied	Somewhat Satisfied	Very Satisfied	Don't Know or Not Applicable
Procuring Plastics-related lab equipment by consignment	○	○	○	○	○
Procuring Plastics-related lab equipment by donation	○	○	○	○	○
Procuring Plastics-related lab equipment by purchasing	○	○	○	○	○
Disposition of unneeded equipment	○	○	○	○	○

Q10 Which Lab PLTS-XXX Equipment is in the most need of replacement?

Q11 Which Lab PLTS-XXX Equipment is the second most need of replacement?

Student Reference Room NET 207

Q12 Please indicate your level of agreement with each of the following statements.

	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree	Don't Know or Not Applicable
The student reference room is a good reference location	○	○	○	○	○
The student reference room needs to be converted to a lecture room	○	○	○	○	○
Corridor displays are a valuable resource	○	○	○	○	○

Office-related areas

Q13 Please indicate your level of agreement with each of the following statements.

	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree	Don't Know or Not Applicable
Office copier/fax resources meet the department needs	○	○	○	○	○
Students should have access to a different copier within the building	○	○	○	○	○
Mail distribution meets the department needs	○	○	○	○	○
Student mail should be distributed in a different area from faculty mail	○	○	○	○	○
Building & Office security meet the department needs	○	○	○	○	○

Q14 Please use this space for additional comments/suggestions regarding any of the above.

Miscellaneous

Q15 Please use this space for any other comments or suggestions that may not fall under any of the previous sections.

Thank you for your time and feedback.

PLTE APR Frequencies ...Facilities

Prepared by: Institutional Research & Testing, 09/14

Statistics

	N				
	Valid	Missing	Mean	Median	Std. Deviation
q1 Building name National Elastomer Center appropriate	6	0	1.33	1.00	.516
q2a PC/Digital systems	6	0	2.67	2.50	.816
q2b Projection systems	6	0	3.50	4.00	.837
q2c White board	6	0	3.83	4.00	.753
q2d Room lighting	6	0	3.50	4.00	.837
q2e HVAC	6	0	1.83	2.00	.753
q3a Equipment available	6	0	2.83	3.00	.408
q3b Equipment maintenance	6	0	3.17	3.00	.753
q3c Layout	6	0	3.33	3.00	.516
q3d Safety systems	6	0	3.33	3.50	.816
q3e HVAC	6	0	2.17	2.00	.753
q3f Traffic	6	0	3.17	3.00	.408
q3g PC Digital support systems	6	0	2.50	3.00	1.225
q3h Hand tool availability	6	0	2.33	2.00	1.366
q3i Mold Inventory & Control Systems	6	0	2.50	3.00	.837
q3j Operable Condition of Equipment	6	0	3.00	3.00	.000
q3k Equipment is up-to-date	6	0	2.67	3.00	.516
q3l Availability of injection molds	6	0	2.67	3.00	.516
q3m Availability of non-injection molds	6	0	3.17	2.50	1.472
q3n Material (resin) availability	6	0	3.00	3.00	.632
q3o Molded sample availability	6	0	2.83	3.00	1.329
q4a Critical breakdowns are promptly handled	6	0	3.50	3.50	.548
q4b Preventive maintenance	6	0	3.00	3.00	.632
q4c Maintained process	6	0	3.17	3.00	.408
q4d Technician availability	6	0	3.50	3.50	.548
q4e Technician skills	6	0	3.67	4.00	.516
q4f Current System in place for reporting equipment breakdowns	6	0	3.50	3.50	.548
q5a HVAC	6	0	1.67	1.50	.816
q5b Building systems	6	0	2.83	3.00	.753
q5c Cleanliness	6	0	3.33	3.00	.516
q5d Janitorial support	6	0	3.50	3.50	.548
q5e Restroom maintenance	6	0	3.67	4.00	.516
q5f Lighting	6	0	3.67	4.00	.516
q6 Top 3 issues/concerns w/ lab equipment	6	0			
q7 Top 3 issues/concerns w/ NEC	6	0			
q8 Comments/suggestions for above	6	0			
q9a Procuring Plastics-related lab equipment by consignment	6	0	3.17	3.00	.983
q9b Procuring Plastics-related lab equipment by donation	5	1	2.80	3.00	1.483

Statistics

	N		Mean	Median	Std. Deviation
	Valid	Missing			
q9c Procuring Plastics-related lab equipment by purchasing	6	0	3.00	2.50	1.673
q9d Disposition of unneeded equipment	6	0	3.00	2.50	1.265
q10 Lab PLTS-XXX Equipment most needs replacing	6	0			
q11 Lab PLTS-XXX Equipment 2nd most needs replacing	6	0			
q12a The student reference room is a good reference location	6	0	2.83	3.00	.983
q12b The student reference room needs to be converted to a lecture room	6	0	2.33	2.00	1.366
q12c Corridor displays are a valuable resource	6	0	2.50	3.00	.837
q13a Office copier/fax resources meet the department needs	6	0	3.83	4.00	.408
q13b Students should have access to a different copier within the building	6	0	2.83	2.50	1.169
q13c Mail distribution meets the department needs	6	0	3.83	4.00	.408
q13d Student mail should be distributed in a different area from faculty mail	6	0	3.00	3.00	.000
q13e Building & Office security meet the department needs	6	0	3.67	3.50	.816
q14 Comments/suggestions for above	6	0			
q15 Additional comments/suggestions	6	0			

Frequency Table

q1 Building name National Elastomer Center appropriate

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	4	66.7	66.7	66.7
	No	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q2a PC/Digital systems

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Dissatisfied	3	50.0	50.0	50.0
	Somewhat Satisfied	2	33.3	33.3	83.3
	Very Satisfied	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q2b Projection systems

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Dissatisfied	1	16.7	16.7	16.7
	Somewhat Satisfied	1	16.7	16.7	33.3
	Very Satisfied	4	66.7	66.7	100.0
	Total	6	100.0	100.0	

q2c White board

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Satisfied	2	33.3	33.3	33.3
	Very Satisfied	3	50.0	50.0	83.3
	Don't Know or Not Applicable	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q2d Room lighting

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Dissatisfied	1	16.7	16.7	16.7
	Somewhat Satisfied	1	16.7	16.7	33.3
	Very Satisfied	4	66.7	66.7	100.0
	Total	6	100.0	100.0	

q2e HVAC

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Dissatisfied	2	33.3	33.3	33.3
	Somewhat Dissatisfied	3	50.0	50.0	83.3
	Somewhat Satisfied	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q3a Equipment available

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Dissatisfied	1	16.7	16.7	16.7
	Somewhat Satisfied	5	83.3	83.3	100.0
	Total	6	100.0	100.0	

q3b Equipment maintenance

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Dissatisfied	1	16.7	16.7	16.7
	Somewhat Satisfied	3	50.0	50.0	66.7
	Very Satisfied	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q3c Layout

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Satisfied	4	66.7	66.7	66.7
	Very Satisfied	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q3d Safety systems

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Dissatisfied	1	16.7	16.7	16.7
	Somewhat Satisfied	2	33.3	33.3	50.0
	Very Satisfied	3	50.0	50.0	100.0
	Total	6	100.0	100.0	

q3e HVAC

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Dissatisfied	1	16.7	16.7	16.7
	Somewhat Dissatisfied	3	50.0	50.0	66.7
	Somewhat Satisfied	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q3f Traffic

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Satisfied	5	83.3	83.3	83.3
	Very Satisfied	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q3g PC Digital support systems

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Dissatisfied	2	33.3	33.3	33.3
	Somewhat Satisfied	3	50.0	50.0	83.3
	Very Satisfied	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q3h Hand tool availability

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Dissatisfied	2	33.3	33.3	33.3
	Somewhat Dissatisfied	2	33.3	33.3	66.7
	Very Satisfied	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q3i Mold Inventory & Control Systems

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Dissatisfied	1	16.7	16.7	16.7
	Somewhat Dissatisfied	1	16.7	16.7	33.3
	Somewhat Satisfied	4	66.7	66.7	100.0
	Total	6	100.0	100.0	

q3j Operable Condition of Equipment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Satisfied	6	100.0	100.0	100.0

q3k Equipment is up-to-date

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Dissatisfied	2	33.3	33.3	33.3
	Somewhat Satisfied	4	66.7	66.7	100.0
	Total	6	100.0	100.0	

q3l Availability of injection molds

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Dissatisfied	2	33.3	33.3	33.3
	Somewhat Satisfied	4	66.7	66.7	100.0
	Total	6	100.0	100.0	

q3m Availability of non-injection molds

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Dissatisfied	3	50.0	50.0	50.0
	Somewhat Satisfied	1	16.7	16.7	66.7
	Don't Know or Not Applicable	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q3n Material (resin) availability

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Dissatisfied	1	16.7	16.7	16.7
	Somewhat Satisfied	4	66.7	66.7	83.3
	Very Satisfied	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q3o Molded sample availability

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Dissatisfied	1	16.7	16.7	16.7
	Somewhat Dissatisfied	1	16.7	16.7	33.3
	Somewhat Satisfied	3	50.0	50.0	83.3
	Don't Know or Not Applicable	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q4a Critical breakdowns are promptly handled

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Satisfied	3	50.0	50.0	50.0
	Very Satisfied	3	50.0	50.0	100.0
	Total	6	100.0	100.0	

q4b Preventive maintenance

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disatisfied	1	16.7	16.7	16.7
	Somewhat Satisfied	4	66.7	66.7	83.3
	Very Satisfied	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q4c Maintained process

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Satisfied	5	83.3	83.3	83.3
	Very Satisfied	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q4d Technician availability

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Satisfied	3	50.0	50.0	50.0
	Very Satisfied	3	50.0	50.0	100.0
	Total	6	100.0	100.0	

q4e Technician skills

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Satisfied	2	33.3	33.3	33.3
	Very Satisfied	4	66.7	66.7	100.0
	Total	6	100.0	100.0	

q4f Current System in place for reporting equipment breakdowns

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Satisfied	3	50.0	50.0	50.0
	Very Satisfied	3	50.0	50.0	100.0
	Total	6	100.0	100.0	

q5a HVAC

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Dissatisfied	3	50.0	50.0	50.0
	Somewhat Dissatisfied	2	33.3	33.3	83.3
	Somewhat Satisfied	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q5b Building systems

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Dissatisfied	2	33.3	33.3	33.3
	Somewhat Satisfied	3	50.0	50.0	83.3
	Very Satisfied	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q5c Cleanliness

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Satisfied	4	66.7	66.7	66.7
	Very Satisfied	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q5d Janitorial support

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Satisfied	3	50.0	50.0	50.0
	Very Satisfied	3	50.0	50.0	100.0
	Total	6	100.0	100.0	

q5e Restroom maintenance

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Satisfied	2	33.3	33.3	33.3
	Very Satisfied	4	66.7	66.7	100.0
	Total	6	100.0	100.0	

q5f Lighting

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Satisfied	2	33.3	33.3	33.3
	Very Satisfied	4	66.7	66.7	100.0
	Total	6	100.0	100.0	

q6 Top 3 issues/concerns w/ lab equipment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Break downs Lack of current (modern) equipment Un surity of consignments	1	16.7	16.7	16.7
	Cost of bringing in new equipment to replace old and finding parts for older equipment Updating computers/software to support equipment Cost of fixing when breakdowns occur	1	16.7	16.7	33.3
	Lack of "state of the art" equipment Woefully outdated computer lab Insufficient budget to purchase equipment and supplies	1	16.7	16.7	50.0
	Need new mold's, make product the students want to take home with them	1	16.7	16.7	66.7
	Not being able to get replacement parts for testing equipment. Not (manufacturer) technical support for many pieces of equipment. Lack of mold maintenance.	1	16.7	16.7	83.3
	Upgrade the aging equipment and machine --- where is the money? Repairing and maintenance of lab equipment Not enough equipment to meet the growing lab size.	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q7 Top 3 issues/concerns w/ NEC

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	16.7	16.7	16.7
	Building is 17 (?) years old and starting to show wear and tear Insufficient lecture space given that so many non- PLTS/RUBR programs are using the NEC. HVAC problems have never been solved.	1	16.7	16.7	33.3
	HVAC Exhaust systems in lab Other areas using lecture rooms	1	16.7	16.7	50.0
	HVAC Needs to be spiffed up Overal wear and tear	1	16.7	16.7	66.7
	HVAC temperature is very inconsistent, Computer lab the computers are dated and slow, classrooms could use an upgrade in lighting	1	16.7	16.7	83.3
	HVAC, never seems to work right for very long (too hot, too cold) Cracks in the floors and walls due to settling of the foundation. Door dimensions often limit the usability of enclosed labs due to the constraints it puts on the size equipment that can be housed.	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q8 Comments/suggestions for above

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		4	66.7	66.7	66.7
	Air intake for HVAC is located where many plastic fumes accumulate!	1	16.7	16.7	83.3
	We need a better way to procure donated & consigned equipment. Solely relying on program faculty to do this has not been effective.	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q9a Procuring Plastics-related lab equipment by consignment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Dissatisfied	1	16.7	16.7	16.7
	Somewhat Satisfied	4	66.7	66.7	83.3
	Don't Know or Not Applicable	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q9b Procuring Plastics-related lab equipment by donation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Dissatisfied	1	16.7	20.0	20.0
	Somewhat Dissatisfied	1	16.7	20.0	40.0
	Somewhat Satisfied	2	33.3	40.0	80.0
	Don't Know or Not Applicable	1	16.7	20.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

q9c Procuring Plastics-related lab equipment by purchasing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Dissatisfied	1	16.7	16.7	16.7
	Somewhat Dissatisfied	2	33.3	33.3	50.0
	Somewhat Satisfied	1	16.7	16.7	66.7
	Don't Know or Not Applicable	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

q9d Disposition of unneeded equipment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Dissatisfied	3	50.0	50.0	50.0
	Somewhat Satisfied	1	16.7	16.7	66.7
	Very Satisfied	1	16.7	16.7	83.3
	Don't Know or Not Applicable	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q10 Lab PLTS-XXX Equipment most needs replacing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		2	33.3	33.3	33.3
	115	1	16.7	16.7	50.0
	115 = equipment is old Rubber equipment needs to be replaced	1	16.7	16.7	66.7
	PLTS-110	1	16.7	16.7	83.3
	With the recent boom in 3D printing, we should improve our rapid prototyping capabilities. This would be a great benefit to our design related courses.	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q11 Lab PLTS-XXX Equipment 2nd most needs replacing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		3	50.0	50.0	50.0
	223	1	16.7	16.7	66.7
	PLTS-223	1	16.7	16.7	83.3
	The Rosade blow molder should be replaced with a better small blow molder.	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q12a The student reference room is a good reference location

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	16.7	16.7	16.7
	Somewhat Agree	4	66.7	66.7	83.3
	Strongly Agree	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q12b The student reference room needs to be converted to a lecture room

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	16.7	16.7	16.7
	Somewhat Disagree	4	66.7	66.7	83.3
	Don't Know or Not Applicable	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q12c Corridor displays are a valuable resource

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	16.7	16.7	16.7
	Somewhat Disagree	1	16.7	16.7	33.3
	Somewhat Agree	4	66.7	66.7	100.0
	Total	6	100.0	100.0	

q13a Office copier/fax resources meet the department needs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Agree	1	16.7	16.7	16.7
	Strongly Agree	5	83.3	83.3	100.0
	Total	6	100.0	100.0	

q13b Students should have access to a different copier within the building

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Disagree	3	50.0	50.0	50.0
	Somewhat Agree	2	33.3	33.3	83.3
	Don't Know or Not Applicable	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q13c Mail distribution meets the department needs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Agree	1	16.7	16.7	16.7
	Strongly Agree	5	83.3	83.3	100.0
	Total	6	100.0	100.0	

q13d Student mail should be distributed in a different area from faculty mail

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Agree	6	100.0	100.0	100.0

q13e Building & Office security meet the department needs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Agree	3	50.0	50.0	50.0
	Strongly Agree	2	33.3	33.3	83.3
	Don't Know or Not Applicable	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q14 Comments/suggestions for above

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		5	83.3	83.3	83.3
	Most of the equipment in the rubber lab needs to be upgraded. A sustainable funding for the new machine is critical to our hands-on training to meet the the needs of industry for qualified technologists.	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

q15 Additional comments/suggestions

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		6	100.0	100.0	100.0

A. Instructional Environment

The National Elastomer Center (NEC) houses the AAS Plastics and Polymer Engineering Technology program as well as both the BS Plastics Engineering Technology and BS Rubber Engineering Technology programs. The entire building went through a multimillion dollar renovation and expansion in 1997.

The four main lecture rooms allow lecturers to utilize a full range of multimedia delivery systems. Additionally, there are four main laboratory prep rooms that can also serve as adjunct lecture rooms as required.

The main open-area laboratories house state-of-the-art manufacturing equipment that allows the student to experience the same technology that is used in the plastics industry. Auxiliary laboratories, of which there are six, provide an environment for smaller, more specialized equipment.

B. Computer Access and Availability

Computers are available for all students to use through the NEC facilities. The main computer lab houses 17 student work stations that are primarily used for design analyses and project management. These computers are a 2007 level of technology. Current input from the College of Engineering Technology Dean's office is that it is not cost efficient for programs to maintain individual computer labs. At the time of this report, an initiative is underway (but not yet approved) to require program students to provide their own laptop. There is no plan to replace the computers in the NEC computer lab.

Additional computers are available in the NEC processing and auxiliary labs. These computers are also of 2007 vintage and in various states of usefulness. Should a program wide student laptop initiative be implemented, care will have to be taken to examine the licensing issues inherent with placing proprietary software on non-university computers.

C. Other Instructional Technology

The instruction of Plastics Engineering Technology requires a significant amount of capital equipment as well as costly resins. It is through both donations and consignments from companies that have partnered with the program that allows us to avoid purchasing this costly equipment. The consignment arrangements also allow for the consigning company to remove the older equipment after several years and to replace it with newer, more technically relevant equipment. It is this arrangement that keeps the laboratory technically current.

Additional partnerships have been nurtured to allow companies to set up unique equipment, such as a state-of-the-art robotic system. The donating company will use this equipment for their customer's technical training and, when not in use by them, allow students and faculty to utilize these systems.

D. Library Resources

The Plastics Engineeering Technology programs have developed a solid working relationship with FLITE (library). This includes providing the latest references and online resources. Our students actively utilize all of the library resourced including the CAD (Computer Aided Design) software at FLITE. Additionally, the NEC has one room dedicated as a student resource room that acts as both a depository for publications and as a student meeting room.

Interpretation of Facilities and Equipment Survey

The assessment tool was developed by Plastics Engineering Technology faculty and taken by the faculty.

The results are as follows:

The consensus indicates that the perception of the condition of the classrooms, the availability of equipment, and the support aspect of the building maintenance and equipment is generally favorable.

<u>Areas receiving predominately positive ratings (somewhat and very satisfied)</u>

- Building security meets needs (100%)
- Operable condition of equipment (100%)
- Technician availability (100%)
- Technician skills (100%)
- Breakdowns promptly handled (100%)
- System for reporting breakdowns (100%)
- Building cleanliness (100%)
- Janitorial support (100%)
- Restroom maintenance (100%)
- Office copier resources (100%)
- Projection systems (83%)
- Room lighting (83%)
- Equipment available (83%)
- Equipment maintenance (83%)
- Safety systems (83%)
- Material availability (83%)
- Procuring lab equipment (consignment) (80% of valid)
- Equipment up to date (67%)
- Availability of injection molds (67%)

Key Areas of Attention:

Areas receiving significant negative ratings (somewhat and very dissatisfied)

- Building HVAC (83%)
- Procuring lab equipment (purchasing) (75% of valid)
- Lab HVAC (67%)
- Hand tool availability (67%)
- Disposition of unneeded equipment (60% of valid)
- PC / digital systems (building) (50%)
- Availability of non- injection molds (50%)
- Procuring lab equipment (donation) (50% of valid)

A broad group of written comments is included within the survey summary. A few areas of attention that received multiple comments-

NEC Issues / Concerns

- HVAC system is inconsistent
- NEC is 17 years old and starting to show wear and tear

Lab Equipment Issues / Concerns

- Insufficient budget for upgrading equipment
- Lack of current / modern equipment
- Difficulty finding replacement parts and technical support for obsolete equipment
- Computers are dated and slow, no money to upgrade
- Difficulty in obtaining consignments
- Primary equipment areas identified as needing replacement-
  - Testing laboratories
  - PPET 115 lab
  - Rubber lab

Appendix F

Current Status of the Plastics Industry

Overview of the Plastics Industry

The plastics industry represents processors and manufacturers of machinery, molds, and raw materials. These industries combined make up the third largest manufacturing industry in the United States. Plastics play a vital role in the delivery of many of the products that enhance every aspect of our lives.

A Few Facts on the Plastics Industry

- The U.S. plastics industry employs more than 885,000 people
- The U.S. plastics industry creates more than $380 billion in annual shipments
- There are more than 16,200 plastics facilities in the United States
- The U.S. plastics industry has a trade surplus
- The plastics industry has a presence in every state
- Mexico and Canada are the U.S. plastics industry's largest export markets
- The U.S. plastics industry had its largest trade deficit with China

*The bullets above came from www.plasticsindustry.org

Materials:

The major polymers used in the plastics industry can be broken down into two areas: thermoplastics and thermosets. In the thermoplastics area: the major materials currently used include: polyethylene, polypropylene, polystyrene, polyvinyl chloride, ABS/SAN, Styrene Butadiene Latexes, Polycarbonates, PET, Nylon and other engineering thermoplastics. For thermosetting materials, the main materials used today include: epoxies, melamine's, unsaturated polyester, phenolics, urea's, polyurethanes and polylactic acids.

Processes:

The major processes used in the plastics industry can be broken down into the following areas:

Injection molding, blow molding, extrusion, thermoforming, compounding, calendaring, compression molding, and rotomolding.

End Use Markets:

Today's end use markets include the following areas: Packaging (bottles, film, cups, etc.), building and construction (pipe, siding, insulation, etc.), consumer and institutional (toys, housewares, medical, etc.), transportation, furniture and furnishings, electrical/electronics (computers, appliances, etc.)

Current Issues Facing the Plastics Industry

Some of the main issues facing the plastics industry include: sustaining development in terms of obtaining acceptable profits, displaying environmental stewardship and corporate responsibility.

Some of the economic issues facing the plastics industry include: captive consumption, rise of middle eastern production, and the state of global economies. In addition, the plastics industry is currently addressing its role in possible climate change issues. For example the trend is to improve packaging materials and design for longer shelf life, less wastage of products, and improved health and safety. Finally, some other issues facing the plastics industry today include feed stock supply, international trade, and improvement of plastic plants' new processes and the upgrade of old plants.

Current Status of the Rubber Industry

RubberNews.com

Published on February 10, 2014 @ 6:00am EST

Help wanted: Rubber industry has openings, but will talent follow?

Employment in the rubber industry appears to be at a critical juncture.

In an economy still recovering from the Great Recession, jobs in the industry are plentiful, especially for those with the appropriate credentials.

In fact, if you have education and perhaps some experience—along with intangibles such as drive, determination, flexibility and the mindset to work wherever the job might lead—you could be in store for a rewarding, long-lasting career. With Baby Boomers at or near retirement age, and numerous companies reporting that they intend to add to their work forces, the rubber industry continues to need workers.

So what's the problem?

In order to attract those qualified candidates, the industry must overcome an image problem, say experts, in which a job in rubber is viewed as less "fun" or "sexy" as in other competing sectors. Companies must invest in nurturing and educating young talent, those experts say, and take whatever steps necessary to erase the stigma and transform the industry's reputation.

Perhaps an influx of new talent will start that process.

Industry insiders say that today's job market in the rubber industry is as wide open for prospective job candidates—and as competitive for high quality talent—as it has ever been. A study presented at last fall's ACS Rubber Division's International Elastomer Conference forecasts that employment in the rubber manufacturing industry—not counting tire, tire accessories, rubberized fabric, hose and belt manufacturers—will top 60,000 this year, a slight increase from 2013. And the average salary will increase to $45,000, according to the same material.

For those with some type of engineering background, there is work available in nearly any discipline and most any geographic region you desire.

"The labor force of experienced engineers, especially with some knowledge and training in the rubber industry, is a very competitive group of people," said Lindy Bryant, corporate recruiter for Gates Corp., a global manufacturer of rubber transmission belts and fluid power products. "They simply don't (train) enough engineers to fill all the slots. That's the bottom line."

For those with less education and/or experience, there are plenty of jobs available as well, especially in the industrial distribution sector. Employers are looking to fill slots in inside or outside sales, marketing, accounting, customer service and warehousing, among others.

"Individuals who have an aptitude for technology, a desire to solve problems and enjoy working with others are needed," said Mary Jawgiel, program director for Industrial Careers Pathway, a multifaceted North American work force initiative supported by an alliance of four industrial distribution associations. "Employers are looking for those who are anxious to learn and curious about the industry to fill the need. There does not seem to be an abundance of qualified candidates for any position."

Job market on horizon

Several conclusions can be drawn about the rubber industry's current job climate, based on interviews with a wide range of industry experts, particularly those directly involved in the hiring process.

They include:

• Openings aren't related necessarily to a sudden increase in retirement from the Baby Boomer generation.

While there is no question more Baby Boomers are retiring, some companies say those from that generation continue to work not only because they enjoy it, but also because some companies don't have suitable replacements ready.

"If you stay in this business long enough, you end up being your own grandfather, because there are a lot of us that have been recycled," said Joseph Walker, corporate director of material development and chemical regulatory compliance, Americas, for Freudenberg-NOK Sealing Technologies Inc. "Companies are bought, sold, spun off. They're rationalized; they're downsized; they're upsized; they're offshored; they're reshored. And pretty soon, you've worked for a lot of different companies that you never have to leave your desk."

"A lot of people hang around at Gates," Bryant said. "They get really excited about the projects they are on and don't want to leave when the project still is in process. There's lot of internal training and opportunities for professional development here, so it's not like somebody says, "I'm 65, and I was working on something 20 years ago, so since that's no longer here, I'm going to leave.'

"Yes, people do retire. People decide it's time to buy a sailboat and take the grandkids and go someplace. That's great. But there are so many opportunities that a lot of people like to stay here long term."

• Engineers are among those needed the most.

Officials from almost every company that *RPN* spoke with said they not only had openings for engineers, but they also had difficulty finding quality candidates. And the competition for these candidates is extremely fierce.

Walker said there's a shortfall of 5 million engineers in the automotive support and automotive engineers market segments alone, which impacts the rubber industry.

"I have one company that is willing to pay $85,000 a year for an entry level position," said John O'Neil, president of Integrity Technical Services Inc., a recruiting agency that specializes in technology, engineering and technical personnel throughout Ohio. "Some of these companies are really desperate to find good, qualified talent."

Companies tout the benefits—financial as well as professional—to attract candidates to their team.

Denver-based Gates has more than 14,500 employees and operates manufacturing facilities in every major market. In 2012, Gates ranked 11th in *RPN*'s annual rankings of North American rubber product sales leaders, with revenues that topped $1.3 billion in this continent alone.

Among the benefits for an engineer employed at Gates is the ability to work on a major project with a global team of other Gates' engineers.

"They get on the conference call on Tuesday or Wednesday morning, and they're hooked into our research facility in Aachen, Germany, and they're talking to some of our oil and gas specialists in Dubai, and they've got folks down in Mexico who are doing the actual production of the parts, together with the researchers here in Denver," Bryant said. "That's an opportunity to work with them, and in many cases, it's time to go over to Aachen and see how they're working there, and it's time to go over to China and take a look at something over there. So a lot of our engineers really get to do hands-on, global work, and that is an exciting career development option for them."

And, Bryant said, one other selling point is the potential for career advancement, as Gates fills about half of its positions by promoting from within.

Multiple positions available

• Engineering isn't the only discipline that is needed.

Companies that attended the job fair held during the Rubber Expo last fall were screening a variety of candidates.

"Sales, marketing, finance, human resources ... it runs the gamut," said Kelly Casanova, materials development engineer at Cooper Tire & Rubber Co. "We're interested in people who are the right fit for our company. They don't have to have a Ph.D. for us to have an interest in them."

Marc Wolbert, a recruiting relationship manager for Goodyear, also said the hiring needs for rubber companies is wide ranging. "There is demand for highly specialized individuals to needing individuals for very specific needs," he said.

Most small rubber companies typically don't hire many positions over the course of a year. So while they can be selective, often they have a difficult time filling specialized positions.

"Sometimes we look for someone who is experienced," said John Barry, director of engineered products at Chemprene Inc., which manufactures rubber coated textiles, including rubber belts, coated fabrics, diaphragms and other precision molded products at its 225,000-sq.-ft. plant in Beacon, N.Y. "Frequently though, we look to the up-and-comers, those recent graduates who we can train and develop."

As of late 2013, Barry said Chemprene had hired just one new person during the year.

"We have to be proactive," he said. "There are fewer candidates entering the rubber industry nowadays."

• If you have a background in rubber, your chances for employment rise considerably.

"Trying to find people with a rubber background is challenging," said Terri Ratliff, human resources manager at Akron Rubber Development Laboratory Inc., whose company employs around 85. "Thankfully, there's not a lot of turnover in our company."

Ratliff said her firm often seeks lab technicians.

"There's a lot of entry level positions in those departments," she said. "But if you find somebody with a rubber background, well, that brings something to the table."

Bryant said Gates finds quality, motivated students when the company reaches out to colleges for interns and other cooperatives. And she said the firm has a strong group of experienced engineers.

"The challenge," she said, "comes with finding those in-between: Finding those with some experience. ... People in that three to 10-year group (of experience) are the ones that are the more difficult to find."

Drawing candidates to rubber

c Attracting top talent to the rubber business can be challenging.

When qualified candidates have a choice of industries, rubber can be a difficult sell.

"I think there's a lot more glamour going to work for Google than going to work for a rubber company," Bryant said. "If you're a mechanical engineer, would you rather work for Apple, or would you rather work for a rubber company?"

Gates tries to overcome that stigma by educating prospective employees about the company and its significance to

everyday life.

"Gates makes industrial and automotive belts and hoses. There's nothing less sexy and interesting than that—until you start talking about the things that are important to people," said Mark Tenney, director of global brand services and corporate communications at Gates.

He said he asks job candidates if they like air conditioning on a hot day, or whether they depend on their camera working in all kinds of conditions.

"Gates makes a belt that makes that possible," he said. "So when you start to dissect all the things in our lives that have meaning and are important to us that, a) we take for granted, and b) we just expect, when you dissect that and take it apart, you find Gates is at the heart of just about everything."

In fact, Gates likes to tout this line: If it moves you, there's a good chance Gates has a part in it.

"Once we start talking about this with potential employees and candidates, they think, "Really? Wow,' " Tenney said. " "The work that I'm going to do is going to affect the world in ways that are really incalculable.' If we had more engineers that we could tell the story to, I'd imagine we'd have a much easier time of recruiting them."

Walker, meanwhile, believes the rubber industry has an image problem. While he said his company, Freudenberg, spends plenty of resources creating a safe, clean manufacturing environment that supplies its workers with the proper protective equipment, he said that isn't the industry standard.

"You go into some of these jobs, and the guy has no mask on, and he's using a particulate, and he's dirty from head to toe," Walker said. "That's just not a strong sell point.

"So when you bring customers through, you have to tell them, be sure you don't hang on to the hand railings when you're going up the gantry because you'll get dirty. What's with that?"

Mining young talent

• Educational institutions and trade organizations must continue to promote the industry and expand their curriculum in order to attract young talent to fill the job openings.

Many colleges and universities offer general engineering programs, while Ferris State University in Big Rapids, Mich.; the University of Massachusetts at Lowell; and the University of Akron are among those that offer specific programs geared toward the industry.

Still, some industry officials believe that young people need more exposure to rubber science, as early as high school. Walker, in particular, is animated about the need to engage kids as early as possible. He said institutions only give a cursory mention of rubber science and technology, while ignoring polymer science and engineering.

"When they talk rubber, (it's) natural rubber. ... They really don't teach how to design rubber or all the different kinds of rubber," Walker said. "They'll teach mechanical engineers when to use specifics and all those different grades, but they don't do the same for rubber. It's almost like in many cases, in many institutions, it's the ignored material.

"Quite frankly, I think many instructors are uncomfortable enough with their own knowledge of the material that they simply ignore talking about it."

Freudenberg-NOK decided to implement its own school curriculum, so to speak. The company recently established its Emerging Professional Program—an 18-month to two-year program in which Freudenberg pursues recently

graduated engineers from universities, then trains them extensively throughout the company before assigning them to a job within the organization best suited to their talents.

Organizations such as the ACS Rubber Division spend considerable resources engaging youths in the industry. Just last fall, at the International Elastomer Conference, the group honored the University of Akron for establishing its inaugural student chapter with the Rubber Division. In addition, the division awarded more than $15,000 in scholarships.

Walker, past chairman of the Rubber Division, believes all rubber groups can do more to promote the industry, including advertising in the media to raise awareness of the industry.

"Members need to try to be involved in this level as a guest lecturer (in classrooms), if nothing else," he said. "We need to get some of these high school kids to talk to their chemistry teachers and ... maybe bring the ones that are in the AP classes to your local rubber group meetings. Let them see what it's like in the real world. Get a couple of companies to host career days so kids can see rubber being made.

"These are good ideas, but they are very, very difficult to turn into reality," Walker said. "Sometimes the schools don't want to get out of the box because there's an implied level of comfort in what they do."

The bottom line, however, is that while job opportunities abound within the rubber industry for most any qualified candidate—especially recent graduates with an engineering background—more attention still needs to be focused on recruitment.

"Many of these kids have four or five offers from different companies, just for internships or co-ops," Bryant said. "It is competitive. We definitely have to provide that growth opportunity to students. The old days of interns coming in making coffee are long gone."

Link: http://www.rubbernews.com/article/20140210/NEWS/302109997/help-wanted-rubber-industry-has-openings-but-will-talent-follow&template=printart