

SABBATICAL LEAVE APPLICATION – Part II Proposal and Supporting Documentation

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Department: Applied Engineering, Safety & Technology

NOTE: SIX copies of this form, all related attachments, and a current curriculum vitae are due in the Provost's Office **no later than Friday, September 9, 2016**. Each applicant should ensure that Part I of the Sabbatical Leave Application form (Eligibility Verification) is submitted to the Provost's Office prior to completion of the following information.

Please attach additional pages and use appropriate headings for the following three areas of information: (1) Information Related to Merit, (2) Information Supporting the Application, and (3) Curriculum Vitae.

Instructions: Click in a box below to enter data – boxes expand as needed to fit your entry. This form may be saved to a separate drive.

Information Related to Merit

Please respond to each of the following (please limit to five pages total excluding timeline and supporting information):

1. Purpose of the Sabbatical

A. General Purpose

The purpose of this sabbatical leave is threefold, providing focused time and attention to:

- 1) Research the current status and future outlook of advanced manufacturing technologies in manufacturing industries in the Lancaster County Workforce Development Board service region.
- 2) Prepare on-line learning modules for the Applied Engineering and Technology Management required capstone course, ITEC 492 Technical Entrepreneurship.
- 3) Expand my knowledge and expertise in advanced manufacturing technology with specific focus on additive manufacturing technologies.

B. Specific Objectives

#1. Research Industrial Application of Advanced Manufacturing Technologies

- a) Through formal survey, on-site industry visitations, and use of available regional labor market information, the researcher will collect and analyze data to determine advanced manufacturing technologies currently in place as well as those planned or desired for future implementation within the Lancaster Workforce Development Board service area.
- b) Conduct a qualitative comparative analysis of advanced manufacturing technology in industry with Millersville University Advanced Manufacturing content and program outcomes.
- c) Submit peer reviewed publications and presentations focused on the research undertaken in this proposal that addresses current industry trends, future direction, and workforce demands.
- d) Present results to the Lancaster County Workforce Development Board, AEST Department faculty, AEST Advisory Council, and other interested stakeholders.
- e) Identify potential internship and employment prospects for AEST graduates.
- f) Expand relationships and promote opportunities available within the AEST department with manufacturing industries.

#2. Development of On-line Learning Modules

- a) Build updateable digital learning modules for ITEC 492 Technical Entrepreneurship.
- b) Convert lecture notes, handouts, and PowerPoint slides into on-line learning modules.
- c) Update course and develop new content and lecture notes based, in part, on information acquired in Objective #1 above.

#3. Professional Development in Advanced Manufacturing Technology

- a) Advance personal skills in advanced manufacturing specific to additive manufacturing and related computer design engineering methodologies.
- b) Participate short-term intensive training classes offered by providers such as, for example, Synergis workshops.

C. Expected Products

1. Peer-reviewed journal submission:
 - a) The Journal of Technology, Management & Applied Engineering.
2. Peer Reviewed Presentations:
 - a) American Society of Engineering Educators Annual Conference (Engineering Technology Division);
 - b) The Association of Technology, Management and Applied Engineering Annual Conference (Manufacturing Division).
3. Non-peer reviewed presentations:
 - a) AEST Applied Engineering & Technology Advisory Council;
 - b) Lancaster County Workforce Development Board;
 - c) AEST department faculty;
 - d) Technology & Engineering Association of Pennsylvania Conference
4. Identification of student internship opportunities within the Lancaster County Workforce Development Board region to include at a minimum, company description, contact information and position description.
5. Development of on-line learning modules for ITEC 492 Technical Entrepreneurship.
6. Completion of two Synergis® Technologies (or similar) training workshops to further engineering technology knowledge and skills in order to enhance teaching competence.

D. Value to Own Professional Development

Having served a large and complex department as Chairperson for six years (2008 – 2014) and during a time of major changes; and my university-wide colleagues as APSCUF President during a challenging contract negotiations period (2015 – 2017), I look forward to delving with focus into projects and activities that I find personally interesting and rewarding as well as contribute to my own professional development. Specifically, researching advanced manufacturing, coupled with the creation of learning modules, and growing my advanced manufacturing knowledge base, will positively impact my pedagogy, as well as afford me with a renewed research agenda.

E. Value to Academic Discipline

1. Research Advanced Manufacturing in Industry

“Advanced manufacturing is a family of activities that (a) depend on the use and coordination of information, automation, computation, software, sensing, and networking, and/or (b) make use of cutting edge materials and emerging capabilities enabled by the physical and biological sciences, for example nanotechnology, chemistry, and biology. It involves both new ways to

manufacture existing products, and the manufacture of new products emerging from new advanced technologies.” (President’s Council of Advisors on Science and Technology, Report to the President on Ensuring American Leadership in Advanced Manufacturing, June 2011, p. ii.) According to The National Strategic Plan for Advanced Manufacturing (Executive Office of the President, National Science and Technology Council, February 2012), advanced manufacturing is emerging as potent a driver of economic growth, and there is a need to accelerate investment to include education and training.

With advanced manufacturing being quite broadly defined, this research will contribute to the body of knowledge by providing authentic workforce and technology needs as well as future opportunities as identified by industry professionals. This information will provide a finer road map for the profession.

2. Development of On-line Learning Modules

The materials generated for ITEC 492 are specific to the needs of the course. When I developed this course it was apparent that no single textbook adequately covered the content. While the intent is to use the materials for specifically for ITEC 492 (at this point there are no plans for dissemination beyond MU) there is potential for its adoption by professors at other institutions.

3. Professional Development in Advanced Manufacturing Technology

“Applied Engineering is the field concerned with the application of management, design, and technical skills for the design and integration of systems, the execution of new product designs, the improvement of manufacturing processes, and the management and direction of physical and/or technical functions of a firm or organization.” (ATMAE Venn 2009). Furthering one’s skill base and knowledge is crucial to adequately preparing students for careers within this rapidly changing component of engineering technology.

F. Value to University

The objectives of proposed sabbatical leave contributes directly to the following Millersville University Strategic Goals and Goal Strategies:

Strategic Goal A. *To engage learners to contribute positively to contemporary and future workplaces and communities.*

SGA Strategy 1: Create a learner-focused environment that contributes to student success.

Sabbatical Objective #2: Development of On-line Learning Modules.

SGA Strategy 3: Identify student interests and workforce needs and prepare students to become career-ready across and within disciplines, including preparation for post-graduate education.

Sabbatical Objective #1. Research Industrial Application of Advanced Manufacturing Technologies.

SGA Strategy 4: Lead in the development and adoption of experiential and innovative strategies that enhance student learning.

Sabbatical Objective #2. Development of On-line Learning Modules.

Sabbatical Objective #3. Professional Development in Advanced Manufacturing Technology.

SGA Strategy 5: Nurture relationships between faculty, staff, and students with individuals and partners in our community.

Sabbatical Objective #1. Research Industrial Application of Advanced Manufacturing

Technologies.

Strategic Goal B. *To ensure long-term success of the University.*
SGB Strategy 5: Through the new academic master plan, invest in the development of new, innovative academic programs or the revision of existing programs to meet emerging workplace needs.
Sabbatical Objective #1. Research Industrial Application of Advanced Manufacturing Technologies.

Strategic Goal C. *To embrace agility within our culture of excellence.*
SGC Strategy 2: Change our institutional culture to one where we anticipate internal and external change to meet the needs of current and future students.
Sabbatical Objective #1. Research Industrial Application of Advanced Manufacturing Technologies.

G. Provide a timeline to support the requested length of sabbatical leave:

| | Sep | Oct | Nov | Dec | Jan '18 | Feb | Mar | Apr | May |
|--|--|--|---|---|---|---|--|--|------------|
| Objective #1 Research Adv. Mfg. | 1. Identify Population 2. Develop Survey Instrument | 3. Admin. Survey 4. On-site visitations | 5. Data analysis 6. Curricula review (Visitations) | 7. Competency validation (Visitations) | → (Visitations) | 8. Accreditation validation 9. Submit proposal for peer rev'd. presentation (Visitations) | 10. Organize results for presentation → | 11. Prepare paper to include findings and recommendations → | |
| Objective #2 Module Develop. | | | | | Update existing lectures; develop learning mods. → | | | | |
| Objective #3 Prof. Develop. | | 1. Synergis or similar academic training. Adjusted by offering schedule. | 2. Work w/software 3. ATMAE Conference - Manufacturing update (3 days) | and equip. → | | | 4. Synergis or similar academic training. Adjusted by offering schedule. | 5. Work w/software → | and equip. |

- Methodology to be employed in fulfillment of the sabbatical objectives. List specific steps to be employed. If a summer sabbatical has been requested, include the justification for the leave during that period of time.

The steps to be employed are largely outlined in the timeline identified in 1.G. above. While the above timeline encompasses the academic year of the requested sabbatical leave, work is planned to commence prior to and during the summer of 2017 to assemble industry contact information and data from the Keystone Research Center, the Lancaster Chamber of Commerce, the Pennsylvania Manufacturers Association, and the Lancaster County Workforce Development Board. Module assessment and refinement will commence during the fall 2018.

- If the proposal is an initiation of a new activity, indicate how it will be continued to fruition after the leave terminates. If the proposal is an extension of prior

professional activities, indicate the status of the project and the role of the sabbatical in bringing it to fruition.

The major research focus of this proposed sabbatical, identifying current and future implementation of advanced manufacturing technologies in industry, is a new avenue of work but somewhat associated with an National Science Foundation grant (\$810,00 over four years) for which I was Co-Principal Investigator (Advanced Manufacturing: Establishing Foundations for Education and Career Pathways from Middle School through College, Pennsylvania State System of Higher Education, a project funded by the National Science Foundation's Advanced Technological Education Program under Grant No. DUE-0603367). The product of the grant activity identified ways to contribute to the workforce shortages primarily through education and awareness at the middle and secondary school levels to include students, teachers, counselors and parents. Our work was negligible at the collegiate level. It is anticipated that the proposed sabbatical research work will make a contribution that helps to fill that void by identifying industry workforce needs and trends.

4. What qualifications, prior experience, and other evidence indicate your likelihood of successfully accomplishing the purposes and objectives of the planned sabbatical?

My research interest and expertise in manufacturing technology spans my many years in the profession. During my early tenure at Millersville University I served on the editorial board of the subscription quarterly, the *Manufacturing Forum*, a publication that provided readers with a systems model approach to understanding manufacturing concepts coupled with curricula tools for academicians. I also contributed to chapters and was a reviewer for the Society of Manufacturing Engineers Tool and Manufacturing Engineers Handbook, Vol. 8, *Plastic Part Manufacturing*; co-authored a two-volume instructor resource *Manufacturing Processes and Manufacturing Materials*, distributed by the Display Corporation of America (DCA), Warrington, PA; and served as reviewer for three editions of the text *Industrial Plastics: Theory and Application*, to include the authors initial draft. In addition to presentations and publications related to the NSF grant noted in 3 above, much of my scholarship has centered on manufacturing technology and industrial organization. I have served industry as a process consultant, and as a trainer (R.R. Donnelly Corp). Within the university, I co-developed, and more recently solely revised, the AEST manufacturing concentration, now called the Advanced Manufacturing concentration; additionally I taught and developed many of the manufacturing technology and management courses. I serve on the Lancaster County Workforce Development Board (formerly the Workforce Investment Board), originally appointed by the Lancaster County Commissioners in 2007, and subsequently reappointed. The WDB provides businesses with locally validated labor market information, and arrange for a service delivery system that meets the workforce needs (see Fries letter).

During the fall 2001 I administered a survey to 300 construction technology companies within Lancaster, Lebanon and York counties, to determine workforce demands, soft and hard skill competencies, and employment trends. My study resulted in the development of the Construction Technology concentrations now a part of our associate and baccalaureate degree programs and provided faculty with useful data (see LaPorte letter). These programs have since been fully accredited and remain one of the stronger Applied Engineering and Technology offerings. The fall 2001 study also aided the department's overall accreditation results in that it demonstrated external validation in developing and maintaining programs, an accreditation board requirement. The results of the study were presented at the national conference of the Association of Applied Engineering and Technology Management (ATMAE). Faculty from Ball State University, Muncie Indiana, attended my ATMAE presentation, consulted with me after the conference, and ultimately adopted many of the lessons learned from my research in the development of their own construction technology degree program. I have since served as an on-site external reviewer for their degree program.

**SABBATICAL LEAVE APPLICATION – Part II
Proposal and Supporting Documentation**

Information Supporting the Application

Please respond to each of the following:

1. Indicate supporting funds made available such as grants, fellowships, contracts, or scholarships. In cases where travel is planned, indicate how the costs are to be underwritten.

Funds for professional development may be sought through the AEST Department Myers Fund. My annual department professional development allocation of (typically) \$700 will be used for travel. Research funds are anticipated to be minimal, but a proposal will likely be developed to secure funds from the MU Faculty Grants Committee.

2. Indicate and attach any supporting documents from department chairs, publishers, organizations, agencies, or institutions that verify your endeavor.

Please see the attached supporting letters in Appendix A.

Mr. Steven Fries, Immediate Past Interim Executive Director, Lancaster Workforce Development Board; Manager of HR Development & Communications (retired).

Mr. Thomas Kealey, AET Advisory Council Member & Past Chair; President, Brown Transmission & Bearing Company, Manheim, PA.

Mr. John Matthews, AET Advisory Council Member & Past Chair; Sales & Support, Distributed Systems Services, Wyomissing, PA.

Dr. Mark Miller, Chair, Department of Technology, University of Texas, Tyler;
Chair Association of Technology, Management & Applied Engineering (ATMAE)
Accreditation Board; Developer, ATMAE Manufacturing Specialist
Certification Examination.

3. Indicate and attach any supporting materials from University peers or superiors.

Please see attached supporting letters in Appendix B.

Dr. Kenneth DeLuca, Professor, Department of Applied Engineering, Safety & Technology.

Mr. James Hartman, Instructor, Department of Applied Engineering, Safety & Technology.

Dr. Michael Jackson, Dean, College of Science and Technology.

Dr. James LaPorte, Emeritus Professor, Department of Applied Engineering, Safety & Technology.

Dr. John R. Wright, Professor, Department of Applied Engineering, Safety & Technology.

**SABBATICAL LEAVE APPLICATION – Part II
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Curriculum Vitae

1. A current curriculum vitae must be included with other supporting materials attached to this Sabbatical Leave Application Form – Part II (one sheet, two-sided maximum).

As a condition of your being granted a sabbatical leave, under the provisions of Section I, Act 224 of the General Assembly, 1961, you must agree to return to employment at Millersville University immediately following the expiration of the leave for a period of not less than one year. In addition, you must, upon your return, (1) submit to the President a written summary of your sabbatical activities, (2) be willing, if asked by the President, to discuss with the President and the Sabbatical Leave Committee the details of your leave and (3) give appropriate recognition to Millersville University in any resulting publications. Your signature on this form constitutes such agreement in the event that you are granted the leave request. Your signature also indicates that, to the best of your understanding, you meet all legal and contractual requirements to qualify for a sabbatical of the length and dates requested.

Applicant's Signature

Date

