Pittsburg State University

Faculty Senate Agenda

Date: Monday, November 25, 2013
Time: 3:00 p.m.
Location: S102 Kansas Technology Center

AGENDA

I. Call to order

II. Approval of Minutes from September 23 meeting

III. Announcements
   A. Provost and Vice-President of Academic Affairs- Dr. Lynette Olson
   B. Associate Vice President of Enrollment Management and Student Success – Bill Ivy
   C. PSU/KNEA Remarks- Dr. Browyn Conrad
   D. Student Senate Remarks- Ms. Bailey Peak
   E. BIG Event Director – Jake Letner
   F. Unclassified Senate Remarks- Dr. Andrew Myers
   G. Classified Senate Remarks- Dacia Clark
   H. Faculty Senate Report- Justin Honey

IV. Committee Reports (Reports from committees will begin with Undergraduate Curriculum Committee followed by Academic Affairs)
   A. Academic Affairs Committee- Chair, Greg Murray, Recorder, Hazel Coltharp
      1. Undergraduate Curriculum Subcommittee- Chair, Mike Carper
      2. Library Services Subcommittee- Chair, Barbara Pope
      3. Information Systems Subcommittee- Chair, Khamis Siam
      4. Continuing Studies Subcommittee- Chair, Susan Schreiner
      5. Departmental Academic Honors Subcommittee- Chair, Akram Taghavi-Burris
      6. Honors College Subcommittee- Chair, Doug Younger
      7. Writing Across the Curriculum Subcommittee- Chair, Greg Murray
      8. Diversity and Multicultural Affairs Subcommittee- Chair, Carol Werhan
   B. Student Faculty Committee- Initial Chair, Peter Chung
C. All University Committee- Chair, Rebeca Book

D. Faculty Affairs Committee- Chair, Jamie McDaniel

E. Constitution Committee- Initial Chair, Mark Johnson

F. General Education Committee- Chair, Mark Johnson

G. Budget Committee- Chair, Rebecca Butler

All University Committees or Other Appointments

V. Unfinished Business

VI. New Business

VII. Open Forum

VIII. Adjournment- Next Meeting- Monday, December 9, 2013, 5102 Kansas Technology Center
Undergraduate Curriculum Committee
Thursday, November 14, 2013

Attendees:
Mike Carper (Chairman), Julie Dainty (Ex-Officio), Chris Anderson, David O'Bryan, John Thompson.

Committee Actions:
The following items of legislation were brought before the committee:

1. The Automotive Technology Department developed a NEW COURSE named AT 641 Construction Equipment Systems for their Diesel emphasis.
   (John Thompson represented the Automotive Technology Dept.)
   - Motion to Approve: David O'Bryan
   - Second: Julie Dainty
   - Approved

2. The Chemistry Department developed a NEW MAJOR: Polymer Chemistry. The department also developed several NEW COURSE’s for this new major including:
   CHEM 235 Laboratory Safety and Compliance
   CHEM 270 Sophomore Research in Polymer Chemistry
   CHEM 360 Introduction to Polymer Science and Technology
   CHEM 370 Junior Research in Polymer Chemistry
   CHEM 625 Polymer Synthesis and Characterizations
   CHEM 626 Polymer Synthesis and Characterizations Lab
   CHEM 640 Polyurethanes and Their applications
   CHEM 650 Conducting Polymers and Their applications.
   CHEM 670 Senior Research in Polymer Chemistry
   CHEM 680 Physical Properties of Polymers
   CHEM 681 Polymer Chemistry Colloquium
   CHEM 683 Biopolymers
   CHEM 685 Selected Topics in Polymer Chemistry
   CHEM 687 Polymers in Nanotechnology
   CHEM 690 Selected Research Projects in Polymer Chemistry
   (No one attended the meeting to represent the Department.)
   - Motion to Approve the NEW MAJOR and the NEW CLASSES: Chris Anderson
   - Second: Julie Dainty
   - Approved

3. The Department of History, Philosophy, and Social Sciences submitted for a REVISION TO MAJOR of Social Work.
   (No one attended the meeting to represent the Department.)
   - Motion to approve: David O-Bryan
   - Second: Chris Anderson
   - Approved

The Undergraduate Curriculum Committee approved items 1-3 listed above.
September 3, 2013

TO: Arts and Sciences Curriculum Committee, University Curriculum Committee

FROM: Karl R. Kunkel, Dean of Arts and Sciences

RE: Proposal for New Courses to Support the Bachelor of Science in Polymer Chemistry Degree Program

The Department of Chemistry and Dean’s Office in the College of Arts and Sciences submit the following package of proposals for a new Bachelor of Science degree program in Polymer Chemistry. This undergraduate program is an important aspect of the Polymer Initiative recently funded by the State of Kansas. All included forms were reviewed and approved by faculty in the Department of Chemistry. The required forms and support documentation are attached.

The proposal package includes:

New Major Request Template and Kansas Board of Regents Application for New Program forms.

Creation of New Courses-

CHEM 235 Laboratory Safety and Compliance
CHEM 270 Sophomore Research in Polymer Chemistry
CHEM 360 Introduction to Polymer Science and Technology
CHEM 370 Junior Research in Polymer Chemistry
CHEM 625 Polymer Synthesis and Characterizations
CHEM 626 Polymer Synthesis and Characterizations Lab
CHEM 640 Polyurethanes and Their Applications
CHEM 650 Conducting Polymers and Their Applications
CHEM 670 Senior Research in Polymer Chemistry
CHEM 680 Physical Properties of Polymers
CHEM 681 Polymer Chemistry Colloquium
CHEM 683 Biopolymers
CHEM 685 Selected Topics in Polymer Chemistry
CHEM 687 Polymers in Nanotechnology
CHEM 690 Selected Research Projects in Polymer Chemistry

Please contact me directly if you have any questions or need additional information. Thank you for considering these proposals.
Department(s): Chemistry
College(s): Arts & Sciences

Date of Submission to the Department: 08/19/2013

Contact Person: Dr. Dilip Paul □ Faculty member □ Chair

Title of Proposed Major: Polymer Chemistry
Credit Hours: 64-66

Delivery Method: □ Face-to-Face □ On-line □ Hybrid

If face-to-face/hybrid, location offered: Pittsburg State University

Purpose/Justification for Major: In Fall 2011, Pittsburg State University (PSU) proposed a new academic initiative in Polymer Chemistry to Governor Sam Brownback and the Kansas Legislature that involves awarding a Bachelor of Science in Polymer Chemistry to students. This initiative received funding in FY13 and FY14, with the promise of $1 million annually added to the University’s base funding to support the polymer initiative.

PSU is in a unique position to create and implement this initiative due to the presence of the Kansas Polymer Research Center (KPRC) on our campus. Given the promising future of polymer science, the relevance of this field for the Kansas economy, the lack of other polymer science programs in the region, and the obvious unique link between PSU and KPRC, it makes sense for PSU to offer a degree in polymer chemistry.

KPRC has an established history taking the agricultural products of Kansas and turning them into polymers usable in industry. PSU has a strong established record providing high quality education in the areas of chemistry and plastics engineering. Joining and enhancing these units creates a valuable arrangement for our students, the region, and economic development in the state of Kansas.

The polymer and plastics industries are among the largest employers of high tech, high value jobs for science majors. In fact, the American Chemical Society division of Polymer Chemistry projects 50% of all chemists work with polymers at some point in their career. In the absence of a formal polymer chemistry program, the burden for training falls to polymer companies and new employees must learn on the job. Students, who have this training through coursework, laboratory, research experiences, internships, and other hands-on education, not only save the companies time and money, but give these students an advantage in the job market and allow industry the opportunity to grow and develop at a faster pace. Training students for these contemporary lucrative careers are enhanced by offering a degree program in polymer chemistry joining the resources, laboratories, and scientists of KPRC with the resources and faculty available in the PSU Department of Chemistry and the Plastics Engineering Technology program.

(include unique and distinguishing features of the proposed major, such as its faculty, facilities, resources, and history)

Date first offered: Fall, 2014
Estimated Enrollment: 15

(Year)
Major Description: The Bachelor of Science with a major in Polymer Chemistry requires a minimum of 124 semester hours. Students also must complete a minor. (as it will appear in the catalog)

Please provide the course information as you wish it to appear in the catalog:

Core Science Courses (36 hours)

- CHEM 215-216 General chemistry I/laboratory * (5 hrs)
- CHEM 235 Laboratory safety and compliance (1 hr)
- CHEM 225-226 General chemistry II/laboratory (5 hrs)
- CHEM 325-326 Organic chemistry I/laboratory (5 hrs)
- CHEM 335-336 Organic chemistry II/laboratory (5 hrs)
- MATH 150 Calculus I ** (5 hrs)
- PHYS 104-130 Engineering physics I/Elementary physics laboratory I (5 hrs)
- PHYS 105-132 Engineering physics II/Engineering physics laboratory II (5 hrs)

* - CHEM 215-216 satisfies the Physical Sciences general education requirement.

** - MATH 150 satisfies the Mathematics general education requirement.

Polymer Chemistry Core Courses (22 - 24 hours)

- CHEM 360 Introduction to polymer science and technology (3 hrs)
- CHEM 611 Senior review and assessment (1 hr)
- CHEM 625-626 Polymer synthesis and characterization/laboratory (5 hrs)
- CHEM 680 Physical properties of polymers (3 hrs)
- CHEM 681 Polymer chemistry colloquium (1 hr)
- CHEM 690 Selected research projects in polymer chemistry (1 - 3 hrs)
- PET 370-371 Thermoplastic resins/laboratory (4 hrs)
- PET 374-375 Thermoset resins/laboratory (4 hrs)

Elective Polymer Courses (select 6 hours)

- CHEM 270 Sophomore research in polymer chemistry (1 hr)
- CHEM 370 Junior research in polymer chemistry (1 hr)
- CHEM 640 Polyurethanes and their applications (3 hrs)
- CHEM 650 Conducting polymers and their applications (3 hrs)
- CHEM 670 Senior research in polymer chemistry (1 hr)
- CHEM 683 Biopolymers (3 hrs)
- CHEM 685 Selected topics in polymer chemistry (1 - 3 hrs)
- CHEM 687 Polymers in Nanotechnology (3 hrs)
- PET 373-372 Plastic processing I/laboratory (4 hrs)
Additional Resources Required (e.g. library or multimedia resources, technology, space, major expense, etc.): The Polymer Chemistry major will require additional resources, including lab space, a student study area, significant equipment acquisition, and renovated faculty office space. All of these needs are funded through the recurring legislative allocation dedicated to this initiative.

Will any additional student fees be required (e.g. equipment, clothing, travel, licensing, etc.)? □ Yes □ No

If “yes,” please realize that it will need to gain approval of the President’s Council.

Rationale: ______

Will this major have specific General Education courses required? □ Yes □ No

Please realize that it will need to gain approval of the General Education Committee.

Will this major affect any education majors? □ Yes □ No

If “yes,” please realize that it will need to have the approval of the Teacher Education Council.

What additional costs will be required for this major (e.g. staffing, equipment, etc.)? See the note above concerning required additional resources. Further, this program will require three additional tenure-earning faculty lines. All expenses related to this program will be paid by the recurring legislative allocation.

Will this major impact any other department/college/unit’s curricula or programs? □ Yes □ No

If “yes,” have relevant discussions occurred? □ Yes □ No

Documentation of these discussions (e.g. copies of e-mails, memos, etc.) is required to be attached.
PITTSBURG STATE UNIVERSITY

LEGISLATIVE PROCESS
AUTHORIZATION/NOTIFICATION SIGN-OFF SHEET

☑ Approved: Department Chairperson
Date 9/13/13 Signature, Department Chairperson

☒ Approved: College Curriculum Committee
Date 11/14/13 Signature, College Curriculum Committee Chair

☒ Approved: Dean of College
Date 11/11/13 Signature, Dean

☐ Approved: Teacher Education Council (if applicable)
Date ______ Signature, Teacher Education Council Chair

☐ Approved: Faculty Senate University Undergraduate Curriculum Committee
Date 11/18/13 Signature, Undergraduate Curriculum Committee Chair

☐ Approved: Faculty Senate
Date ______ Signature, Recording Secretary, Faculty Senate

☐ Final approved Packet Forwarded to Provost's office.
Date ______ Signature, Recording Secretary, Faculty Senate

Approvals at Kansas Board of Regents levels:

☐ COCAO (First Reading): Date:____

☐ COCAO (Second Reading) Date:____

☐ COPS Date:____

☐ KBOR Date:____

The Provost's Office will notify the department, college and Registrar of completion of the approval process

Originating Department(s): After completing this form, in its entirety, please upload it to the Zimbra Briefcase, "Undergraduate Curriculum Legislation" (within the appropriate College folder, "Preliminary Legislation"), to allow for review and questions. Any modifications should be saved "original file name.version2.docx" and uploaded as well.

Following final College Curriculum Committee approval, please print the final version of this form, apply the appropriate signature, and forward to the Office of the Registrar.
Following Faculty Senate Approval, SUBMIT SIGN-OFF SHEET AND FINAL COMPLETE PACKAGE, in electronic format, TO THE OFFICE OF THE PROVOST (220 RUSS HALL) FOR FORWARDING TO THE KANSAS BOARD OF REGENTS FOR BOARD APPROVAL.

(MUST BE ENTERED INTO KBOR PI/CIP SYSTEM AT TIME OF SUBMISSION TO KBOR).

FORMS TO ACCOMPANY PROPOSAL

There are SEVEN ITEMS that will be prepared and submitted with the proposal:

a. PSU Request for New Major Form (preceding)
b. PSU Legislative Process Authorization/Notification Sign-off Sheet (preceding)
c. KBOR Application for New Program (following)
d. KBOR Program Proposal Narrative (following)
e. KBOR New Degree Request (following)
f. KBOR Curriculum Outline (following)
g. KBOR Fiscal Summary for Proposed Academic Program (following)

Please Note

This is at least a six-month process from the time of first submission and is designed to eliminate concerns and questions at the beginning of the process. Any questions/concerns not addressed prior to the review by the College Curriculum Committee and the Undergraduate Curriculum Committee may result in an additional month added to the process, which may result in another year's delay in implementation, before it is sent to the Kansas Board of Regents for approval.

IMPORTANT

New majors should be submitted to the Faculty Senate no later than the November meeting to allow for KBOR review and approval and implementation for the following fall semester.
Kansas Board of Regents
Application for New Program

Name of Submitting Institution: PITTSBURG STATE UNIVERSITY

Address: 1701 SOUTH BROADWAY – PITTSBURG, KS 66762

Contact Person: Dr. Karl R. Kunkel, Dean of Arts and Sciences

CIP: 

Approved by Faculty Senate: 

Date

Approved by Graduate Council: 

Date
PROGRAM PROPOSAL NARRATIVE

The New Program Proposal shall include a section entitled "Program Proposal Narrative" and include responses to the following questions and requests for information:

a. Program Need and Student Characteristics. Program proposals shall establish clearly the need for the proposed program. Need for a proposed program shall be judged on the basis of the following criteria:
   (1) Is the program central to the mission of the institution?
       • The proposed program shall be centrally related to the Board approved Mission Statement of the institution.
       • The proposed program shall be included in the list of programs identified for development in the institution's statement of aspiration as approved by the Board in February, 1993, or the proposal shall discuss the rationale for amending the Statement of Aspiration.
   (2) What is the student demand for the program?
       • The volume of student demand for the proposed program shall be demonstrated through some form of disciplined survey analysis.
       • Student demand shall be demonstrated to be at a sufficient volume to justify the program. Normally three years after inception of the program, doctoral programs should have five students, master's programs should have 20 students, and baccalaureate programs should have 50 students.
   (3) What is the demand for graduates of this program?
       • The proposal shall demonstrate specific job opportunities including labor market demand data at both the local and state level. The proposal shall also demonstrate other post-collegiate experiences for graduates of this program. (6-27-07)
   (4) What are the locational and comparative advantages of this program?
       • The proposal shall discuss and compare similar programs in other institutions in the Regents system and related programs in the same institution.
       • The proposal shall discuss and compare similar programs in the region and compare their quality with the program under consideration.
       • The proposal shall demonstrate why the program should be located at the proposing institution.
       • The proposal shall consider and demonstrate the advantages and disadvantages of program being a freestanding, cooperative or joint program including collaborative degree options. (6-27-07)
       • The proposal shall state where the institution ranks the proposed program in its list of priorities. The proposal shall state how this determination has been made.
       • The proposal shall state the importance of establishing this particular program vis-à-vis other program alternatives.
   (5) What are the characteristics of the students who will participate in this proposed program?
       • The characteristics of the pool from which students of this proposed program will be drawn shall be described.
       • The specific procedures and criteria for admission into this proposed program shall be described.
       • The specific opportunities for student interaction shall be described.

b. Curriculum of the Proposed Program. Program proposals will be expected to describe the curriculum of the proposed program. The curriculum of the proposed program shall be judged on the basis of the following criteria:
   (1) What is the curriculum of the proposed program?
       • Describe the more important academic objectives of the proposed program, including the range of skills and knowledge future graduates will possess.
       • The course work required of all students who major in this program shall be described. Attachment I, the curricular outline form, shall be completed.
       • Internships and practica required of students in this program shall be described.

c. Program Faculty. Program proposals shall establish clearly the requirements, costs and quality of the faculty for the program.
   (1) What is the quality of the faculty?
       • The instructional staff shall consist of a sufficient number of permanent faculty appropriately qualified for the level of instruction. Three years after their inception, programs should be staffed according to the following guidelines: Bachelors Program - 3 with Ph.D. or appropriate terminal degree; Masters Program 3 additional faculty with Ph.D. or
appropriate terminal degree; Specialists and Doctoral Programs two additional faculty with Ph.D. or appropriate terminal degree.
• The proposal shall differentiate core faculty from others who teach in the program.
• The instructional staff shall consist of faculty whose academic specializations are appropriate to the new degree program.
• The instructional staff shall consist of faculty whose academic, instructional and scholarly accomplishments suggest that the proposed program will be of high quality and appropriate to the institution’s mission, role and aspirations.
• Identify other teaching requirements outside the proposed program assigned to core faculty. Also identify the proportion of their assignments devoted to the proposed program.
• The number, qualifications and rank of proposed new faculty shall be identified.
• The cost of proposed new faculty shall be identified, along with expected timelines for their employment by the institution.
• The proposal shall include curriculum vitae of all faculty delivering courses for the proposed major. How many graduate assistants will serve the program?
• The proposal shall identify any necessary graduate positions and budgeted salaries.

d. Academic Support. Program proposals shall establish clearly the requirements, costs and quality of the academic support services for the program.
(1) What are the academic support services for this program?
  • The advising services, library, audio-visual and academic computing resources shall be of sufficient volume and quality to support the program effectively.

(2) What new library materials and other forms of academic support are required beyond normal additions?
  • The expected number of library acquisitions shall be identified with anticipated costs.
  • New or enhanced forms of academic support shall be identified with the anticipated costs.

(3) What new supporting staff will be required beyond normal additions?
  • The proposal shall list support staff requirements and budgeted salaries.

e. Facilities and Equipment. Program proposals shall establish clearly the requirements, costs and quality of the facilities and equipment for the program.
(1) What are the anticipated facilities requirements (existing, renovated or new)?
  • Space requirements shall be sufficient to the instructional and laboratory needs of the program. The facilities needed for the delivery of a high quality program shall be itemized.
  • Renovated or new facilities shall carry a fiscal note, identifying necessary work and additional costs.
  • Sources of funding for renovation and new construction shall be identified.

(2) What new equipment will be required beyond normal additions?
  • Equipment requirements shall be sufficient to the instructional and laboratory needs of the program. A statement shall be made about the equipment needed for the delivery of a high quality program.
  • The proposal shall itemize available inventory, including equipment condition and life span.
  • The proposal shall itemize new equipment needs.

f. Program Review, Assessment and Accreditation. Program proposals shall establish clearly the institution’s plan to monitor, maintain and enhance the quality and effectiveness of the program.
(1) What program review process or evaluation methods will be used to review the program?

(2) What student learning outcomes measures will be used to assess the program’s effectiveness?

(3) What are the institution’s plans regarding program accreditation?
  • The program shall identify the specialized accrediting agency where applicable.
  • The proposal shall identify institutional plans to have the program accredited, including timelines and projected costs of achieving and maintaining accreditation.
Kansas Board of Regents  
New Degree Request  

**Institution:**  
PITTSBURG STATE UNIVERSITY  

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<tr>
<th>Criteria</th>
<th>Program Summary</th>
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1. Program Identification  
CIP  

2. Academic Unit  
Department of Chemistry/College of Arts and Sciences  

3. Program Description  
The Bachelor of Science in Polymer Chemistry  

4. Demand/Need for the Program  
In Fall 2011, Pittsburg State University (PSU) proposed a new academic initiative in Polymer Chemistry to Governor Sam Brownback and the Kansas Legislature that involves awarding a Bachelor of Science in Polymer Chemistry to students. This initiative received funding in FY13 and FY14, with the promise of $1 million annually added to the University’s base funding to support the polymer initiative.  

PSU is in a unique position to create and implement this initiative due to the presence of the Kansas Polymer Research Center (KPRC) on our campus. Given the promising future of polymer science, the relevance of this field for the Kansas economy, the lack of other polymer science programs in the region, and the obvious unique link between PSU and KPRC, it makes sense for PSU to offer a degree in polymer chemistry.  

KPRC has an established history taking the agricultural products of Kansas and turning them into polymers usable in industry. PSU has a strong established record providing high quality education in the areas of chemistry and plastics engineering. Joining and enhancing these units creates a valuable arrangement for our students, the region, and economic development in the state of Kansas.  

The polymer and plastics industries are among the largest employers of high tech, high value jobs for science majors. In fact, the American Chemical Society division of Polymer Chemistry projects 50% of all chemists work with polymers at some point in their career. In the absence of a formal polymer chemistry program, the burden for training falls to polymer companies and new employees must learn on the job. Students, who have this training through coursework, laboratory, research experiences, internships, and other hands-on education, not only save the companies time and money, but these students also have an advantage in the job market. Further, this program provides industry the opportunity to grow and develop at a faster pace. Training students for these contemporary lucrative careers are enhanced by offering a degree program in polymer chemistry joining the resources, laboratories, and scientists of KPRC with the resources and faculty available in the PSU Department of Chemistry and Plastics Engineering Technology program.
The Polymer Initiative at PSU supports Governor Sam Brownback’s “Road Map for Kansas” with resulting outcomes strengthening the Kansas economy by increased income for students successfully completing degree programs and subsequently working in the private sector in this growing field of polymers. In addition, faculty, as well as undergraduate students will contribute to the body of basic and applied knowledge in the polymers field, with much of this research involving contracts with industry partners for developing new techniques, processes, and products.

The degree program in polymer chemistry aligns with three strategic goals in the original Kansas Board of Regents document, “Foresight 2020: A Strategic Agenda for Kansas Higher Education.”

Strategic Goal #4 – “Ensure that students earning credentials and degrees across the higher education system possess the foundational skills essential for work and in life.”

Strategic Goal #5 – “Enhance alignment between the work of the state’s higher education system and the needs of the Kansas economy.”

Strategic Goal #6 – “Enhance the regional and national reputation of Kansas universities through aspirational initiatives.”

Ensure Students Possess Foundational Skills for Work
A bachelor’s degree in polymer chemistry offered by PSU creates an ideal context for training undergraduate students in an area of future high potential industrial growth given the agricultural economic base of Kansas. Graduates will possess skills necessary for successful careers in businesses involved with polymers development and production.

Enhance Alignment between the State’s Higher Education System and Needs of Kansas Economy
As previously stated, much of the Kansas economy is based on agriculture, particularly producing corn and soybeans; as a result KPRC has an established history using and converting these raw materials in the development and production of polymers including but not limited to plastics, synthetic fibers, agricultural chemicals, paints, adhesives, ink, construction materials, and packaging. Polymers also have biomedical applications including artificial skin, prosthetics, the nicotine patch, and the delivery of cancer-fighting medications. Educating students in this development and production process prepares highly skilled workers to step directly into industry, no longer requiring companies to train their workers in basic concepts and processes, ultimately saving time, and expediting the innovation, development, and production process.

Enhance the Regional and National Reputation of Kansas Universities
A significant aspect of this initiative involves enhancing the regional and national reputation of Pittsburg State along with the Kansas higher education system. Establishing a program in polymer chemistry identifies PSU as an institution on the cutting edge in the development and application of polymers. Very few universities in the country offer a specific bachelor’s degrees in this field. Obviously, PSU and the State of Kansas will leverage our unique relationship with KPRC into a progressive and innovative program offered exclusively at Pittsburg State University.
Feedback from Industry
We discussed the idea of creating a specific undergraduate academic program in polymer chemistry with representatives from local industry, recruiters for technical positions, and current university partners. There is universal agreement polymer chemistry is a valuable and unique background, setting Pittsburg State graduates above their competitors for job opportunities in plastics, polymer, and composites manufacturers, as well as inks and resin formulators, packaging, construction materials, and the CASE (coatings, adhesives, sealants, and elastomers) field.

We also learned the knowledge and ability to make predictions and employ structure-property relationships is one of the more valuable benefits of this focused field of study, one directly translating into a benefit for employers. A polymer chemist has first-hand knowledge of how the structure of various polymer components translates into specific final properties and program graduates with this knowledge prove invaluable to companies and corporations involved with the development and production of polymer products.

Employers are looking for chemists who can do more than just “follow a recipe.” As conceived, this field of study includes significant exposure to laboratory work as well as polymer processing. Both of these experiences include hands-on training and exposure to relevant polymer technologies. Undergraduate research clearly demonstrates initiative, creativity, and a self-starting attitude in our graduates, additional valued traits in the chemical industry.

Through feedback we further learned a benefit for science graduates is exposure to multidisciplinary fields, such as polymer science. Industry representatives realize and emphasize the value of working at the intersection of several disciplines. Many new graduates in chemistry or engineering have a solid foundation in these subjects; however, relatively few operate beyond the basic foundation by going into areas intersecting with other related fields of study. Polymer Science forces individuals to work at this intersection where innovation, entrepreneurship, and new products often emerge. The interdisciplinary nature of our proposed academic program not only makes Pittsburg State polymer graduates unique and well-trained, but will prove invaluable to both employers and economic development in Kansas.

5. Comparative/Locational Advantage  As discussed above, there is no other degree program offered at a university in this region focusing specifically on polymer chemistry. Further, the presence of KPRC on the Pittsburg State University campus provides exceptional resources when coupled with the academic assets in our Department of Chemistry and program in Plastics Engineering Technology. This combination provides a very unique and ripe environment for a degree program in polymer chemistry.

6. Curriculum
See curriculum provided for the proposed major in the "Curriculum Outline" below.

7. Faculty Profile
Each of the following faculty will teach in the B.S. in Polymer Chemistry. See Appendix A for detailed vita:

Dr. Peter Dvornic
Dr. Ram Gupta
8. Student Profile
Students entering this major program and career field should have prepared themselves with a strong record high school coursework in science. Students will be admitted to the polymer chemistry major who meet the Pittsburg State University admission criteria. These students will have career interests in companies working with polymers for production and/or have a desire to pursue graduate education either at Pittsburg State or one of the few Ph.D. programs in the United States offering a doctorate in polymer science.

9. Academic Support
All academic support available at Pittsburg State University and in the College of Arts and Sciences will be available for students and faculty in the polymer chemistry major program. Available support includes institutional support programs for freshmen, initiatives offered through the Student Success Center (including the Writing Center), resources available through the Axe Library, access to support for faculty and student travel, and internal grant funding opportunities. In addition, Pittsburg State University and the College of Arts and Sciences provides high caliber support for both hardware and software technology needs.

Students also will have access to the equipment and expertise of scientists at the Kansas Polymer Research Center (KPRC) on our campus as well as equipment and lab space available in both the Department of Chemistry as well as the Plastics Engineering Technology program in the College of Technology at Pittsburg State.

10. Facilities & Equipment
This proposed major has extensive laboratory and equipment needs. These needs will be met through both existing facilities and equipment available through KPRC, the Chemistry Department, and the Plastics Engineering Program, as well as renovations and new equipment funded by the Legislative allocation supporting the polymer initiative at Pittsburg State University.

11. Program Review, Assessment, Accreditation
The Department of Chemistry at PSU is approved by the American Chemical Society (ACS). While there currently are no separate guidelines for polymer chemistry programs in place at this time, the PSU Department of Chemistry, using existing ACS guidelines, will oversee the proposed academic field of study in Polymer Chemistry and seek ACS approval for the new program. The Bachelor of Science in Polymer Chemistry also will be reviewed according to the regular program review cycle and process at Pittsburg State University. Further, all degree programs at the University are required to submit an annual assessment report to the University Assessment Committee documenting progress towards meeting student learning outcomes.

12. Costs, Financing
As stated above, funding for this new major program is included in the $1 million recurring annual addition to the Pittsburg State base allocation provided by Kansas state government. This money funds four new faculty lines, start-up and equipment procurement, facility renovations, acquisition of materials, and operations.
CURRICULUM OUTLINE
NEW DEGREE PROPOSALS
Kansas Board of Regents

I. Identify the new degree:
   **Bachelor of Science in Polymer Chemistry**

II. Provide courses required for each student in the major:

<table>
<thead>
<tr>
<th>Course Name &amp; Number</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>Core Courses</td>
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<tr>
<td>Electives</td>
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<tr>
<td>Research</td>
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Total

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8
If the above format does not fit your curriculum outline, please use this text box:

**Core Science Courses (36 hours)**

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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>CHEM 215-216</td>
<td>General chemistry I/laboratory *</td>
<td>5 hrs</td>
</tr>
<tr>
<td>CHEM 235</td>
<td>Laboratory safety and compliance</td>
<td>1 hr</td>
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<tr>
<td>CHEM 225-226</td>
<td>General chemistry II/laboratory</td>
<td>5 hrs</td>
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<td>CHEM 325-326</td>
<td>Organic chemistry I/laboratory</td>
<td>5 hrs</td>
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<tr>
<td>CHEM 335-336</td>
<td>Organic chemistry II/laboratory</td>
<td>5 hrs</td>
</tr>
<tr>
<td>MATH 150</td>
<td>Calculus I **</td>
<td>5 hrs</td>
</tr>
<tr>
<td>PHYS 104-130</td>
<td>Engineering physics I/Elementary physics laboratory I</td>
<td>5 hrs</td>
</tr>
<tr>
<td>PHYS 105-132</td>
<td>Engineering physics II/Engineering physics laboratory II</td>
<td>5 hrs</td>
</tr>
</tbody>
</table>

* - CHEM 215-216 satisfies the Physical Sciences general education requirement.
** - MATH 150 satisfies the Mathematics general education requirement.

**Polymer Chemistry Core Courses (22 - 24 hours)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 360</td>
<td>Introduction to polymer science and technology</td>
<td>3 hrs</td>
</tr>
<tr>
<td>CHEM 611</td>
<td>Senior review and assessment</td>
<td>1 hr</td>
</tr>
<tr>
<td>CHEM 625-626</td>
<td>Polymer synthesis and characterizations/laboratory</td>
<td>5 hrs</td>
</tr>
<tr>
<td>CHEM 680</td>
<td>Physical properties of polymers</td>
<td>3 hrs</td>
</tr>
<tr>
<td>CHEM 681</td>
<td>Polymer chemistry colloquium</td>
<td>1 hr</td>
</tr>
<tr>
<td>CHEM 690</td>
<td>Selected research projects in polymer chemistry</td>
<td>1 - 3 hrs</td>
</tr>
<tr>
<td>PET 370-371</td>
<td>Thermoplastic resins/laboratory</td>
<td>4 hrs</td>
</tr>
<tr>
<td>PET 374-375</td>
<td>Thermoset resins/laboratory</td>
<td>4 hrs</td>
</tr>
</tbody>
</table>

**Elective Polymer Courses (select 6 hours)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 270</td>
<td>Sophomore research in polymer chemistry</td>
<td>1 hr</td>
</tr>
<tr>
<td>CHEM 370</td>
<td>Junior research in polymer chemistry</td>
<td>1 hr</td>
</tr>
<tr>
<td>CHEM 640</td>
<td>Polyurethanes and their applications</td>
<td>3 hrs</td>
</tr>
<tr>
<td>CHEM 650</td>
<td>Conducting polymers and their applications</td>
<td>3 hrs</td>
</tr>
<tr>
<td>CHEM 670</td>
<td>Senior research in polymer chemistry</td>
<td>1 hr</td>
</tr>
<tr>
<td>CHEM 683</td>
<td>Biopolymers</td>
<td>3 hrs</td>
</tr>
<tr>
<td>CHEM 685</td>
<td>Selected topics in polymer chemistry</td>
<td>1 - 3 hrs</td>
</tr>
<tr>
<td>CHEM 687</td>
<td>Polymers in Nanotechnology</td>
<td>3 hrs</td>
</tr>
<tr>
<td>PET 373-372</td>
<td>Plastic processing I/laboratory</td>
<td>4 hrs</td>
</tr>
</tbody>
</table>
IMPLEMENTATION YEAR FY 2014-2015

Fiscal Summary for Proposed Academic Programs

Institution: **PITTSBURG STATE UNIVERSITY**  Proposed Program: **Bachelor of Science in Polymer Chemistry**

<table>
<thead>
<tr>
<th>Part I. Anticipated Enrollment</th>
<th>Implementation Year</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Full-Time</td>
<td>Part-Time</td>
<td>Full-Time</td>
</tr>
<tr>
<td>A. Full-time, Part-time Headcount:</td>
<td>10</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>B. Total SCH taken by all students in program</td>
<td>205</td>
<td>410</td>
<td>695</td>
</tr>
</tbody>
</table>

**Part II. Program Cost Projection**

A. In implementation year one, list all identifiable General Use costs to the academic unit(s) and how they will be funded. In subsequent years, please include only the additional amount budgeted.

<table>
<thead>
<tr>
<th></th>
<th>Implementation Year</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Budget</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salaries</td>
<td>$423,428</td>
<td>$423,428</td>
<td>$423,428</td>
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<tr>
<td>OOE</td>
<td>$576,572</td>
<td>$576,572</td>
<td>$576,572</td>
</tr>
<tr>
<td>Total</td>
<td>$1,000,000</td>
<td>$1,000,000</td>
<td>$1,000,000</td>
</tr>
</tbody>
</table>

Indicate source and amount of funds if other than internal reallocation:

**Funding for the Bachelor of Science in Polymer Chemistry is provided by the $1 million targeted annual allocation from the Kansas Legislature for the polymer initiative at Pittsburg State University.**

Revised: September, 2003

Approved: ______________
APPENDIX A

FACULTY VITAE
CURRICULUM VITAE

Petar R. Dvornic, Ph.D.
Professor of Polymer Chemistry
and
Distinguished Research Fellow

2806 St. Mary’s Drive, Midland, MI, 48640
Phone: (989) 835-4457
E-mail: pdvornic01@charter.net

Education

Ph.D. Department of Polymer Science and Engineering, University of Massachusetts, Amherst, 1979.
M.S. Department of Polymer Science and Engineering, University of Massachusetts, Amherst, 1978.
M.S. Department of Technology and Metallurgy, University of Belgrade, Belgrade, 1975.
B.S. Department of Technology and Metallurgy, University of Belgrade, Belgrade, 1972.

Theses and Dissertation


Research Experience

Michigan Molecular Institute, Midland, Michigan:
- Distinguished Research Fellow, 2010-2012.
- Senior Research Scientist, 1999-2010.

University of Belgrade, Department of Chemistry, Belgrade, Yugoslavia:
- Associate Professor(Polymer Chemistry), 1991-1996.
University of Massachusetts, Department of Polymer Science and Engineering, Amherst, Massachusetts:
- Postdoctoral Fellow, 1979-1981.

Institute of Chemistry, Technology and Metallurgy, University of Belgrade, Center of Chemistry, Department of Polymeric Materials, Belgrade, Yugoslavia:
- Science Consultant (Equivalent to Full Professor), 1991-1995.
- Senior Research Scientist (Equivalent to Associate Professor), 1982-1996.

Koninklijk Shell Plastics Laboratorium Delft, Delft, Holland:

Teaching Experience

Michigan Molecular Institute, Midland, Michigan:
- Professor of Polymer Chemistry (Courses included: Polymer Synthesis (CMU 602; 1994-2000); Dendritic Polymers Science and Technology (CMU 613; 1997); Silicone Polymers Science and Technology (CMU 707, 1995-2000)).
- Associate Professor, 1993-1997.

Michigan Technological University, Department of Chemistry, Houghton, Michigan:
- Adjunct Professor, (principal mentor to two Ph.D. students: Srinivas Uppuluri, Chem. Eng., and Peter Carver, Chemistry; also served on several dissertation committees and delivered visiting seminars) 1996-present.

Central Michigan University, Department of Chemistry, Mount Pleasant, Michigan:
- Adjunct Professor (for courses see Michigan Molecular Institute above; currently mentoring a Ph.D. dissertation of Tracy Zhang), 1994-present.

University of Belgrade, Department of Chemistry, Belgrade, Yugoslavia:
- Associate Professor (Courses included: Synthetic Polymer Chemistry, a 4th year undergraduate course (UB 501)), 1990-1993; Basic Properties and Preparation of Synthetic Polymeric Materials, a part of a 4th year course: Selected Processes of Chemical Industry (UB 501), 1989-1991.

University of Belgrade, Center for Multidisciplinary Studies, Belgrade, Yugoslavia:

University of Novi Sad, Department of Technology, Novi Sad, Yugoslavia,
- Docent (Equivalent to Assistant Professor), 1981-1991.

Scientific and Professional Societies

American Chemical Society
- Division of Polymer Science: Member, 1977-present.
- Division of Polymer Materials and Engineering: Member, 1995-present.
Society of Plastics Engineers  

Serbian Chemical Society  
- Division of Chemistry and Technology of Macromolecules: Member, 1980-present; President, 1988-1993.  

European Polymer Federation Committee  

Materials Research Society  
- Member, 1995-1999.

American Physical Society  
- Member, 1996-1998.

Scientific Meeting Committees

ISPO 2013, International Workshop on Silicon-Based Polymers, Moscow, Russia, September 22-25, 2013, Member of the International Advisory Board.

ACS Fall Scientific Meetings: Midland Section, Midland, MI:  
- 64th meeting, October 24, 2008, Co-Chair.  
- 63rd meeting, October 19, 2007, Program Co-Chair.  
- 61st meeting, October 14, 2005, Member of the Organizing Committee and Chair of the Symposium on “Nano-Scaled Building Blocks and Nanostructures”.  
- 54th meeting, October 11, 1998, Chairman of the Symposium on “Dendrimers and Dendritic Polymers: From Science Fiction to Reality”.

Paint Research Association International Conferences:  
- “Silicones in Coatings IV”, University of Surrey, Guildford, UK, May 30-31, 2002, Member of the Steering Committee.  
- “Organic-Inorganic Hybrids”, University of Surrey, Guildford, UK, June 12-14, 2000, Member of the Scientific Advisory Committee.  
- “Silicones in Coatings III”, Barcelona, Spain, March 28-30, 2000, Member of the Scientific Advisory Committee.

Materials Research Society:  
- Spring Meeting, April 1996, San Francisco, California, Symposium on "Structure Controlled Macromolecules", Session Chair.

Serbian Chemical Society:  
- XXXV Annual Meeting of the Serbian Chemical Society, Belgrade 1993, Member of the scientific committee.  
- XXXIV Annual Meeting of the Serbian Chemical Society, Belgrade 1992, Member of the scientific committee.

X Yugoslavian Symposium on Chemistry and Technology of Macromolecules, Vrnjacka Banja 1989, Member of the organizing committee.
VI European Symposium on Organic Chemistry - ESOC VI, Belgrade, Yugoslavia, 1989  
- Member of the organizing committee.  
- Editor of "Daily Newsletter".

IV Yugoslavian Symposium on Organic Chemistry, Belgrade 1987, Member of the organizing committee.

Other Professional Activities

Reviewer (many years for):

Proposals: NSF, DoD (ARL, ARO, NRL, US AF), DoE, Petroleum Research Fund, etc.


Science of Advanced Materials (SAM), Interdisciplinary Ph.D. Program of the Central Michigan University, Mount Pleasant, MI, External Advisory Board: Chair, 2009-present.

"Silicon", Springer, UK, Editorial Advisory Board: Member, 2008-present.

MATRIX Midland, Midland, MI:  
- Advisory Board: Member, 2006-present.  
- Board of Managers: Manager, 2004-2006.

American Chemical Society, Midland Section, Midland, MI:  
- Awards Committee: Chair, 2003-2005, Member 2003-present.  

Dendritech Inc., Midland, MI, Board of Directors: Director, 2001-2010.

- Editorial Board: Member, 2001-2008.  
- Dendrimers and Dendritic Polymers: Subject Editor, 2001-2008.


Faculty Council of the Department of Chemistry, University of Belgrade, Belgrade, Yugoslavia: Member, 1992-1994.

Serbian Science Foundation, Belgrade, Yugoslavia; Committee for International Relations: Member, 1991.

Association of the Science Institutes of Serbia, Belgrade, Yugoslavia; Coordination Committee: Member, 1989-1993.

Foundation for Technological Development of the Republic of Serbia, Belgrade, Yugoslavia:  
- General Council: Member, 1990-1993.

**University of Belgrade**, Belgrade, Yugoslavia; Committee for Elections of Professors and Staff Members in Natural Sciences and Mathematics: Member, 1986-1988.

**Institute of Chemistry, Technology and Metallurgy**, Belgrade, Yugoslavia:

**Belgrade Science Foundation**, Belgrade, Yugoslavia:
- Elections and Awards Committee: Member, 1982-1986.


**Institute of Chemistry, Technology and Metallurgy**, Belgrade, Yugoslavia:

**Awards**

**Charles E. Reed Lecturer**, Rensselaer Polytechnic Institute, Troy, NY, April 29, 2008.

**American Chemical Society – Midland Section**, Award for Outstanding Achievement and Promotion of Chemical Sciences, Midland, MI, 2007.

**University of South Australia**, Adelaide, South Australia: Visiting Professor (An International Workshop: "Perspectives on Silicon" at Ian Wark Institute), 2002.


**Serbian Chemical Society**, Belgrade, Yugoslavia, Deserving Member Award, 1992.

**Belgrade Science Foundation**, Award for Contribution to the Development of Science, 1990.

**Serbian Chemical Society**, Award for Contribution to the Society, 1990.

**Belgrade Science Foundation**, Award for Contribution to the Foundation, 1986.

**Fulbright Travel Award**, 1975-1979.

**Areas of Research Interest**

**Synthesis of new monomers and polymers**. Step-growth polymerization reactions. Thermally stable polymers. Polysiloxanes and other silicon-containing polymers. Polyamides, polyhydrazides, poly(amide-


**Applications of dendritic polymers in soft nanotechnology.** Electronics, nano-porous materials for interlayer dielectrics, opto-electronics, photonics, photovoltaics, nano-lithography, protective and smart dendritic polymer coatings, chemical and biological sensors, colorimetric array sensors, nano-domained networks and coatings, polymers in water purification and protection: environmentally benign anti-fouling coatings, anti-fouling reverse osmosis membranes, bio-based bio-degradable hyperbranched polymers.

**Publications and Presentations**

See attached lists.
GRANTS AND CONTRACTS HISTORY: 1995-presents

Petar R. Dvornic, Ph.D.
Professor of Polymer Chemistry
and
Distinguished Research Fellow

2806 St. Mary's Dr., Midland, MI 48640
Phone: (989) 835-4457
E-mail: pdvornic01@charter.net

1. 1995-2000: PI on Dow Corning-MMI program: "Research and Development of PAMAMOS Dendrimers", $75,000-100,000/year for 6 years and total of $555,000. (Commercial production of 14 different types of PAMAMOS launched by Dendritech, Inc., in 2003 as the first commercially available silicon-containing and radially layered copolymeric dendrimers for crosslinking applications.)

2. 1996-1999: Co-PI (w. D. Tomalia and R. Spindler) on the "US Army Dendrimer Center of Excellence", $2.8 M (award); effectively obtained (because of the DoD restrictions imposed on "non-essential spending" after year 1 of the program due to the Bosnian War): $1.85 M.


4. 1998-1999: PI on subcontract to The Dow Chemical Company/IBM "Nautilus" NIST program: "Dendrimers for Thin Film Dielectric Electronic Applications", $92,000.


8. 2001: Consultant (PI: D. Hedstrand; I wrote the proposal and directed the research but was administratively unable to formally act as a PI); BMDO – SBIR Phase 1: "Nano-Porous


16. 2005-2007: Co-PI (w. S. Keinath) on DARPA - IANS ("Institute for Advanced Nanotechnology Solutions") program: “Advanced Polymeric Nanotechnology Solutions for Military Applications”, $ 2 M + $ 400,000 + $ 400,000 for the total of $ 2.8 M.


19. 2007-2012: Key consultant (contributed to the creation of the program and was the only member of the initial team who stayed on it from the beginning to the end) on Xerox, Inc., program: “High Performance Elastomers with Exceptional Heat Resistance”; ca. $ 120,000/year for 5 years and total of $ 600,000.


Total grants and contracts for the period: ca $9.6 M.
PUBLICATIONS

Petar R. Dvornic, Ph.D.
Professor of Polymer Chemistry
and
Distinguished Research Fellow

2806 St. Mary's Dr., Midland, MI, 48640
Phone: (989) 835-4457
E-mail: pdvornic01@charter.net

Books, Textbooks and Monographs:


Book Chapters:


Review Papers:


**Papers:**


**Patents:**


LECTURES AND PRESENTATIONS

Petar R. Dvornic, Ph.D.
Professor of Polymer Chemistry
and
Distinguished Research Fellow

2806 St. Mary's Dr., Midland, MI 48640
Phone: (989) 835-4457
E-mail: pdivonic01@charter.net


49. V. V. Gerov, P. R. Dvornic and J. D. Jovanovic, "Kinetic Investigation of the Hydrosilation Reaction of 1,3-Divinyltetramethyldisiloxane and 1,3-Dihydridotetramethyldisiloxane", XXXV Annual Meeting of the Serbian Chemical Society, Belgrade, Yugoslavia, January 18-20, 1993.


54. V. V. Gerov, P. R. Dvornic and M. N. Govedarica, "Preparation of Linear Poly(1,1,3,3-tetramethyldisiloxanyl)ethylene by Hydrosilation as the Basic Reaction of a Step-Growth Polymerization Process", XXXVI Annual Meeting of the Serbian Chemical Society, Belgrade, Yugoslavia, June 1-3, 1994.


61. V. V. Gerov and P. R. Dvornic, "Rheological and Thermal Properties of Poly(1,1,3,3-tetramethyldisiloxanyl)ethylene", XXXVII Annual Meeting of the Serbian Chemical Society, Novi Sad, Yugoslavia, June 1-2, 1995.


78. P. R. Dvornic: “Structure - Property Relationships in Dendrimers”, Department of Polymer Science and Engineering, University of Massachusetts, Amherst, Massachusetts, April, 24, 1997.


91. *P. R. Dvornic “Dendrimer-Based Elastomers”, Plastics Division, Manufacturing Engineering Technologies Department, College of Technology, Ferris State University, Big Rapids, Michigan, April 23, 1998.


organosilicon) (PAMAMOS) Dendrimers”, 33rd Organosilicon Symposium, Saginaw, Michigan, April 7-8, 2000.


120. P.R. Dvornic, “A Decade of Dendrimer Rheology: What Have We Learned?”, 221st National Meeting of the American Chemical Society, San Diego, California, April 1-5, 2001.


156. A. Sarkar, P. Satoh, P.R. Dvornic and S.N. Kaganove, “PAMAM Dendrimers-Polydiacetylene Nano-Construct Based Colorimetric Biosensors”, 61st ACS Midland Section Fall Scientific Meeting, Midland, MI, October 14, 2005.


* By invitation.
Curriculum Vitae- At a Glance

(Dr. Ram Gupta, Assistant Professor, Pittsburg State University)

TEACHING

- Teaching graduate level courses since 2007. The courses are MAT 780: Polymer preparation and characterization, MAT 550: Introduction to materials science, MAT 651: Introduction to materials science
- Co-adviced 3 graduate students’ for Ph.D. thesis, 15 graduate students’ for MS thesis and 10 undergraduate’s research projects

RESEARCH

- Organic-inorganic junctions, transistors based on polymers using Matrix Assisted Pulsed Laser Evaporation
- Nano-composites of carbon nano-tubes and insulating polymers with conducting polymers for their applications in toxic waste removal, batteries, hetero junctions and corrosion protection and devices based on composites, organic, and inorganic materials
- Nanoparticles for biosensor and biomedical applications
- Dilute magnetic semiconductors, ferromagnetic materials, and multiferroic materials for sensor and data storage applications, high dielectric constant materials and their applications in magneto-capacitance
- Transparent conducting thin films for optoelectronic, photovoltaic, and transparent spintronics, ultra-thin films using Langmuir-Blodgett technique
- Biodegradable metallic implants

FUNDED GRANTS

- “Smart composites based on polyurethane and magnetic materials: Effect of morphology, size and content of the magnetic materials on the properties of polyurethane,” Pittsburg State University- Undergraduate Research Infrastructure Award, (US $2,000), PI, Funded in 2013
- “Hydrothermal synthesis of nano-particles for advanced biomedical applications”, Faculty Research Grant, Missouri State University, (US $7,470), PI, Funded in 2011.
- “N-type ferromagnetism in oxide based dilute magnetic semiconductors”, National Science Foundation, (US $264,747), co-PI, Funded in 2009
- “MRI-RUI: Acquisition of a field emission scanning electron microscope to advance research and education at Missouri State University”, National Science Foundation, (US $467,000), co-PI, Funded in 2008
- “X-ray characterization and analysis facility”, Missouri State University, (US $315,000), co- PI, Funded in 2007

ACHIEVEMENTS

- Published over 100 peer reviewed articles, attended/presented over 80 conferences
- More than 350 citations with h-index of 11
- Senior Editor: Physics Express(Optoelectronics and photonics)
- Editorial Board Member: Journal of Materials, Thin Films Science and Technology
- Reviewer for leading science journals such as Applied Physics Letters, Journal of Applied Physics, Materials Letters
- Article entitled “Highly conducting and transparent multilayer films based on ZnO and Mo-doped indium oxide for optoelectronic applications”, was most viewed article in Optoelectronics and Advanced Materials Rapid Communication in 2009
- Article entitled “Schottky diode based on composite organic semiconductors”, was among the top 25 hottest articles in Materials Science in Semiconductor Processing in 2004
Curriculum Vitae

RAM GUPTA
Assistant Professor
Department of Chemistry, Pittsburg State University
1701 S. Broadway, Pittsburg, KS-66762 (USA)
Phone: (417) 396-6332
E-mail: ramguptamsu@gmail.com

ACADEMIC APPOINTMENT AND EDUCATION

Pittsburg State University        Assistant Professor        2013-Presnt
North Carolina A & T State University Senior Research Scientist 2011-2013
Missouri State University, USA      Research Assistant Professor    2006-2011
Banaras Hindu University, India    Ph.D.                      2005
Banaras Hindu University           M.S. (Honors)               1999

FELLOWSHIPS

Research Fellow, Banaras Hindu University 2000-2004
Senior Research Fellow, CSIR, New Delhi 2004-2005

AWARDS/ACHIEVEMENTS

• Senior Editor: Physics Express (Optoelectronics and photonics)
• Editorial Board Member: Journal of Materials, Thin Films Science and Technology
• Article entitled "Schottky diode based on composite organic semiconductors", was among the top 25 hottest articles in Materials Science in Semiconductor Processing in 2004
• Article entitled “Highly conducting and transparent multilayer films based on ZnO and Mo-doped indium oxide for optoelectronic applications”, was most viewed article in Optoelectronics and Advanced Materials Rapid Communication in 2009
• Biography included in the Marquis Who’s Who in the world, 2006 (23rd Edition)

TEACHING EXPERIENCE

Assistant Professor (Pittsburg State University)

➢ CHEM 320: Introductory Organic Chemistry (Fall 2013)
➢ CHEM 326: Organic Chemistry Lab (Fall 2013)
Research Assistant Professor (Missouri State University)

Classroom Teaching

- MAT 780: Polymer preparation and characterization (Spring 2007, Fall 2008, Fall 2010)
- MAT 550: Introduction to materials science (Team teaching, Fall 2007, Fall 2008)
- MAT 651: Introduction to materials science (Team teaching, Fall 2009)
- MAT 760: Experiments in physical characterization (Team teaching, Spring 2008, Spring 2010)
- MAT 670: Vapor synthesis of materials (Team teaching, Fall 2007, Spring 2009, Spring 2010)

Some of the student’s evaluation for MAT 780: Polymer preparation and characterization are

- He is an excellent teacher
- Dr. Gupta is an excellent instructor

Graduate Student co-Advising for research

<table>
<thead>
<tr>
<th>Year</th>
<th>Name</th>
<th>Research Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011-2013</td>
<td>S. Abdalla (Ph.D.)</td>
<td>Effect of doping on β-tricalcium phosphate bioreabsorbable bulk material and thin film coatings</td>
</tr>
<tr>
<td>2011-2012</td>
<td>T. Haywood (Ph.D.)</td>
<td>Development of ceramic biomaterials coating for implant applications</td>
</tr>
<tr>
<td>2011-2012</td>
<td>K.M. Darkwa (Ph.D.)</td>
<td>Pulsed laser deposited magnesium-hydroxyapatite composite thin film for restorable magnesium bone implants</td>
</tr>
<tr>
<td>2009-2011</td>
<td>A. Hinckley</td>
<td>Structural and magnetic properties of YFeO$_3$ based multiferroic materials</td>
</tr>
<tr>
<td>2009-2011</td>
<td>H.L. Bhatta</td>
<td>Fabrication and characterization of nanoparticles using pulsed laser deposition technique</td>
</tr>
<tr>
<td>2007-2009</td>
<td>A. Ghosh</td>
<td>Study of magneto-transport properties of Co doped indium oxide dilute magnetic semiconductors</td>
</tr>
<tr>
<td>2007-2009</td>
<td>A. Bhattacharya</td>
<td>Selective growth of rectifying contacts on ZnO thin films and their applications to photovoltaics</td>
</tr>
<tr>
<td>2007-2009</td>
<td>U. Ndubuisi</td>
<td>Growth and characterization of chromium doped indium oxide dilute magnetic semiconductors</td>
</tr>
<tr>
<td>2007-2009</td>
<td>N. Nag</td>
<td>A novel approach to synthesis and characterization of ZnO nanoparticles for biomedical applications</td>
</tr>
<tr>
<td>2007-2009</td>
<td>Y. Dhopade</td>
<td>Preparation and study of high dielectric materials with low leakage current</td>
</tr>
<tr>
<td>Year</td>
<td>Name</td>
<td>Research Topic</td>
</tr>
<tr>
<td>--------</td>
<td>--------------------</td>
<td>-------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>2007-2008</td>
<td>S. Ganti</td>
<td>Electrical properties of Au-SrTiO$_3$ nanocomposite thin films</td>
</tr>
<tr>
<td>2006-2007</td>
<td>C. Vera</td>
<td>A novel method for fabrication of carbon based semiconductors</td>
</tr>
<tr>
<td>2006-2007</td>
<td>C. Ramreddygarai</td>
<td>Nanoscale analysis of carbon nanotubes deposited on highly oriented pyrolytic graphite</td>
</tr>
<tr>
<td>2006-2007</td>
<td>R. Kantikona</td>
<td>Utilizing nanoporous alumina membranes for molecular transport and silica nanotubes synthesis</td>
</tr>
<tr>
<td>2006-2007</td>
<td>S. Manchiraju</td>
<td>Effect of strain due to substrates on Mn-doped ZnO dilute magnetic semiconductor thin films</td>
</tr>
<tr>
<td>2006-2007</td>
<td>N. Mamidi</td>
<td>Growth and characterization of Co-doped indium oxide dilute magnetic semiconductors</td>
</tr>
<tr>
<td>2006-2007</td>
<td>L. Fadiga</td>
<td>Fabrication of spin valve organic light emitting devices</td>
</tr>
<tr>
<td>2006</td>
<td>G. Mundada</td>
<td>The effect of non magnetic doping and growth temperature on the magneto-transport properties of manganese and cobalt doped zinc oxide dilute magnetic semiconductors</td>
</tr>
</tbody>
</table>

**Undergraduate Student co-Advising for research project**

<table>
<thead>
<tr>
<th>Year</th>
<th>Name</th>
<th>Research Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer 2012</td>
<td>M. Onstott</td>
<td>Corrosion studies on Mg discs in salt solution</td>
</tr>
<tr>
<td>Summer 2012</td>
<td>I. Lemongo</td>
<td>Magnesium/hydroxyapatite composites for biodegradable bone implants</td>
</tr>
<tr>
<td>2010-2011</td>
<td>H. Gemar</td>
<td>Preparation and characterization of Cr-doped In$_2$O$_3$</td>
</tr>
<tr>
<td>2010-2011</td>
<td>M. Langhoff</td>
<td>Dilute magnetic semiconductors based on Co-doped In$_2$O$_3$</td>
</tr>
<tr>
<td>Summer 2010</td>
<td>A. Manivannan</td>
<td>Growth and characterization of gold nano-particles using pulsed laser deposition technique</td>
</tr>
<tr>
<td>2009</td>
<td>A. George</td>
<td>Dilute magnetic semiconductors</td>
</tr>
<tr>
<td>2008-2009</td>
<td>J. Doak</td>
<td>Synthesis of metal nanoparticles using pulsed laser deposition technique</td>
</tr>
<tr>
<td>Summer 2007</td>
<td>A. Manivannan</td>
<td>Growth and characterization of Pt-C nanocomposite</td>
</tr>
<tr>
<td>Summer</td>
<td>S. Jahnke</td>
<td>Growth and characterization of Pt-C nanocomposite</td>
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</tbody>
</table>
### Research Areas
- Conducting polymers and their composites.
- Polymers from bio waste.
- Organic thin films using Matrix Assisted Pulsed Laser Evaporation (MAPLE) technique for device applications.
- Nano-composites of carbon nano-tubes and insulating polymers with conducting polymers for their applications in toxic waste removal, batteries, hetero junctions and corrosion protection.
- Nanoparticles for biosensor and biomedical applications.
- Devices based on composites, organic, and inorganic materials.
- Ultra-thin films using Langmuir-Blodgett technique for various applications.
- Biodegradable metallic implants
- Dilute magnetic semiconductors (DMS), ferromagnetic materials, and multiferroic materials for sensor and data storage applications.
- High dielectric constant materials and their applications in magneto-capacitance.
- Transparent conducting electrodes for opto-electronic and photovoltaic application.
- Multilayer thin films for optoelectronics and transparent spintronics.
- Fabrication of electrical rectifiers based on composites materials.

### Some Significant Research Accomplishments
- Utilized the composite of polyaniline-polystyrene for toxic heavy metal ion removal from aquatic environment for the first time.
- Applied the composites of polyaniline with polystyrene and polyvinyl chloride for Schottky barrier diode for the first time.
- Observed a very high magneto-resistance in optically transparent and conducting gadolinium doped indium oxide thin films for the first time.
• Fabricated very high mobility thin films for optoelectronic applications for the first time.
• Fabricated highly conducting and transparent thin films based on all metal oxides multilayers for the first time.
• Detail charge transport mechanism through heterojunction is provided.
• Synthesized new amphiphilic compounds using Langmuir-Blodgett techniques for various applications such as corrosion protection of metal in sea water.
• Developed a new technique to fabricate controlled size nano-particles for bio-medical applications.

GRANTS

• “Collaborative Research and Education in Advanced Materials at NCAT (CREAM-NCAT)”, Army Research Office, (US $ 650,000), co-Principal Investigator, Submitted 2012.
• “Hydrothermal synthesis of nano-particles for advanced biomedical applications”, Faculty Research Grant, Missouri State University, (US $7,470), Principal Investigator, Funded in 2011.
• “N-type ferromagnetism in oxide based dilute magnetic semiconductors”, National Science Foundation, (US $264,747), Co-Principal Investigator, Funded in 2009.
• “MRI-RUI-Acquisition of a field emission scanning electron microscope to advance research and education at Missouri State University”, National Science Foundation, (US $ 321,000), MSU Matching (US $146,000), Co-Principal Investigator, Funded in 2008.
• “X-ray characterization and analysis facility”, Missouri State University, (US $315,000), Co-Principal Investigator, Funded in 2007.

SERVICE

• Organized and participated as judge in ‘The Region VII Science Olympiad Tournament’ held at Missouri State University.
• Co-organized ‘Missouri Association of Physics Teacher (MAPT) Meeting’, held at Missouri State University.
• Participated as Judge for oral papers presented to ‘Missouri Junior Academy of Sciences”.
• Senior Editor: Physics Express/Optoelectronics and photonics, Editorial Board Member: Journal of Materials, Thin Films Science and Technology
• Reviewer for journals: Applied Physics Letter; Applied Surface Science; Chemical Papers; Chemical Engineering Journals; Journal of Applied Physics; Journal of
Environmental Management; Journal of Hazardous Materials; Journal of Molecular Structure; Journal of Non-Crystalline Solids; Journal of Physics and Chemistry of Solids; Journal of Physical Chemistry; Journal of Polymer Research; Materials Chemistry and Physics; Materials Letters; Microelectronic Engineering; Materials Science and Engineering B; Optical Communications; Physica E: Low-Dimensional Systems and Nanostructures; Polymer Composites; Surface and Coatings Technology; Synthetic Metals; Superlattice and Microstructure; Solid State Sciences.

COLLABORATORS

Internal: J. Neef, D. Paul,

External: Drs. D. Kumar, J. Sankar, Z. Xu (North Carolina A & T State University); Drs. K. Ghosh, L. Dong, A. Wanekaya, R. Delong, R. Mayanovic (Missouri State University, Springfield, MO); Dr. S. Guha (University of Missouri, Columbia, MO); Dr. S. Mishra (The University of Memphis, Memphis, TN)

RESEARCH PROJECTS

• Biodegradable metallic implants: North Carolina A&T State University has been awarded an Engineering Research Center (ERC) from the National Science Foundation (NSF). The ERC is considered the "crown jewel" among NSF awards. In the past 25 years, only about 30 ERCs have been funded by NSF. I am working at ERC to conduct research in the areas of biomedical engineering and nano bio applications in partnership with the Universities of Cincinnati and Pittsburgh. ERC also has a global technical partner in Germany’s Hannover School of Medicine and a global cultural and outreach partner—the Indian Institute of Technology, Madras, India. California State University at Los Angeles will serve as an outreach partner in the USA. Craniofacial applications will benefit children who are born with birth defects—cleft palates, congenital heart defects, etc. Currently children with these defects are fitted with devices that are applied with “nuts and bolts” to the face. These fixtures do not have the ability to "grow" with the child and hence have to be removed and refitted every so often. The research done in the ERC will introduce devices made with magnesium alloys to be fitted. These alloys have the ability to adapt to the body and "grow" with the child without refitting. The magnesium alloys can be disposed by the body after their work is done, through the blood stream with no side effects. This will have a tremendous impact in the craniofacial and orthopedic markets. We are also working to develop new metallic materials to be introduced as stents in the treatment of cardiovascular problems.

• Organic-inorganic devices: I am working on the fabrication of some novel devices such as Schottky barrier junctions, transparent p-n junctions, and solar cells. Some of the results have been published in peer-reviewed journals. I have studied the detailed current-voltage characteristics and temperature dependence current-voltage characteristics. These studies have provided a detail insight of transport mechanism at interface in these devices. I have applied several theoretical models to study the transport properties in details. I fabricated transparent p-n junction based on ZnO-NiO. I have fabricated solar cells based on ZnO and
organic active materials. Now, I am working to improve the efficiency of the solar cell by utilizing nanoparticles and vertically aligned junctions.

- **Growth of organic materials using MAPLE technique:** The overall performance of polymer-based solar cell is strongly depending on the quality of polymer-semiconductor interfaces. Typically, spin coating and dip coating techniques are used for deposition of polymer films; however, these methods do not permit a precise control of thickness of the films, which is essential for device fabrication. Matrix Assisted Pulsed Laser Evaporation (MAPLE), a derivative of PLD, is an alternative method of depositing polymer and biomaterial thin films that allows homogeneous film coverage of high molecular weight organic materials for a layer-by-layer growth without any laser induced damage. I have successfully grown di-octyle substituted polyfluorene (PF) and its co-polymer using this technique. The optical and structural properties of these films are compared with spin coated films using Raman spectroscopy, photoluminescence, and absorption. Our results indicate that the structural and optical properties of the polymer films grown by MAPLE technique are similar to bulk with no discernable laser-induced damage.

- **Organic devices using MAPLE technique:** MAPLE technique allows homogeneous film coverage of organic materials for layer-by-layer growth providing a tighter control of the polymer-dielectric interface in field-effect transistors (FETs) and metal-insulator-semiconductor (MIS) diodes. We have measured the electrical characteristics of FETs and MIS diodes using MAPLE and spin coated grown fluorene copolymer films. $I-V$ characteristics of MAPLE grown FETs show a better performance compared to the spin coated FETs. C-V investigations of the MIS structures show that loss as well as capacitance and time constant dispersions are less in the MAPLE grown film compared to the spin coated film.

- **Organic conductors and their composites:** My early research was focused on the basic drawbacks of organic conductors that prevented these materials from active device applications. I have worked on some of the drawbacks such as mechanical and environmental stability of the organic conductors. The organic conductors are not environmentally stable due to the presence of polaron and bipolaron states that provide active sites for moisture and air for attachment and degradation of organic materials with time. I extensively worked to improve the mechanical, environmental, and electrical properties of organic conductors. My original work resulted in a number of publications in leading material science journals.

- **Electronic devices based on organic composites:** I have utilized composites of organic conductors for device fabrications such as Schottky barrier diodes, organic rechargeable batteries. I have observed that these composites have better device characteristics compared to that of pure conductors. The detailed transport mechanism responsible for improvement of device parameters has been discussed in my research articles. I have fabricated the organic batteries based on these composites. These organic batteries show good rechargeability and environmental stability.

- **Organic composite for toxic waste removal:** I have utilized for the first time the composites of polyaniline with insulating polymers for effective heavy metal ion absorbent. These
composites are highly efficient for removal of toxic heavy metals ions such as mercury, at trace level from aquatic environment. I have also used some cheap, biomass such as babool bark as an efficient toxic waste removal. My research encompasses major contributions in reducing heavy metal ions pollution in aquatic environment.

- **Langmuir-Blodgett thin films and its applications:** Semiconducting Langmuir-Blodgett films based on conducting polymers offer the possibility of developing molecular scale electronic devices. I have synthesized many new organic materials for Langmuir-Blodgett technique. This technique is very unique and provides the atomic level controlled thin films. I have studied the structural and electrical properties of these films. I have successfully used these composites for corrosion protection of copper in sea water using this technique. Needless to say that very few experts are using this technique as this requires rigorous synthesis experience.

- **Transparent electrodes for optoelectronics and photovoltaic applications:** Organic light emitting diodes, transistors, and photodiodes are currently attracting much attention. These devices have a wide range of applications due to their flexibility, easy processibility and low manufacturing cost. The performance of any optoelectronic device is greatly influenced by properties of the transparent conducting electrode. Highly conducting and transparent electrode is a prerequisite for successful fabrication of these devices. The performance of these devices also depends on surface smoothness of the electrodes. The leakage current of the device is observed to increase with increase in surface roughness of the electrodes. One of my aims is to improve the performance of organic light emitting diodes and solar cells by improving the properties of transparent conducting electrodes. The performance of the device also depends on junction characteristics. Therefore, the understanding of electrical properties of interface is very important for device applications. I am fabricating low cost, high performance transparent conducting electrodes. I have developed a few innovative high performance electrodes. I have optimized the properties of transparent electrodes for high optical transparency as well as high conductivity. I observed the optimization process that could lead to highly conducting and transparent electrodes with mobility as high as 350 cm²V⁻¹s⁻¹. Mobility is one of the important factors that could decide the speed of any device. The interesting phenomenon that is the outcome of my extensive research is the transition from semiconductor to metallic behavior. This research has resulted in several publications in leading journals. I have used some novel ideas for fabrication of high quality transparent electrodes using multilayer films. I have reported for the very first time highly transparent, conducting, and cheap electrodes based on all metal oxide films.

- **Nanomaterials for bio-medical and energy applications:** Recently, I have been engaged in developing a novel technique for synthesis of nanoparticles in precursor free environment. This technique will not only reduce a purification step after the synthesis of nanoparticles but also produces very uniform sized nanoparticles. These controlled sized contamination free nanoparticles can be used for nano-drug delivery. I have grown nanoparticles of various oxides and metals and observed that incorporation of nanoparticles in active materials enhances absorption of solar radiation. I am working to functionalize nanoparticles for sensors and drug delivery applications (collaboration with bio-medical group). Nanoparticles of iron, cobalt, and nickel embedded in polymers or carbon are known as encapsulated
ferromagnetic nanoparticles. These can be embedded as single magnetic domains and are important for applications ranging from data storage, sensors for electromagnetic shielding devices, and tunnel junction devices.

- **Multiferroics:** Presently, my research focus on lead-free and environment friendly piezoelectric materials and single phase multiferroics, both in bulk and thin film forms. This research work aims to fabrication of multilayer thin films of lead free piezoelectric materials such as BaTi$_{0.8}$Zr$_{0.2}$O$_3$, Ba$_{0.7}$Ca$_{0.3}$TiO$_3$ and Ba$_{0.7}$Ca$_{0.3}$Ti$_{0.95}$Zr$_{0.05}$O$_3$ by pulsed laser deposition (PLD) using dense target made from the conventional ceramic method. Additionally, I am working to produce multiferroism in a magnetic perovskite oxide, YFeO$_3$ (both in bulk and thin film), through the strain and lone-pair effects by partial replacement of Y$^{3+}$ with elements having different ionic radii (La$^{3+}$, Lu$^{3+}$) and lone pair electrons in Bi$^{3+}$ (two electrons on the 6s orbital at A-site cation, Bi$^{3+}$). The importance of research on doped YFeO$_3$ will resolve hopefully the cause of inducing ferroelectricity in single phase multiferroics is either due to lone pair effect or due to strain effect. Thin films of these single phase multiferroics will improve our ability to accurately characterize multiferroic behavior and we also expect this approach will surely open a door to design practical devices based on magnetolectric coupling.

- **Bandgap engineering:** The performance and efficiency of a solar cell mostly depends on bandgap of individual layers used to fabricate the device. The bandgap of semiconductors can be tuned by doping. The bandgap also depends on the growth conditions of the films. I have extensively worked to modify the bandgap of semiconductors using pulsed laser deposition technique. I have also worked to modify the bandgap solar active organic materials by nanoparticles incorporation.

- **Dilute magnetic semiconductors or spintronics:** Over the past few years, I have been investigating the effects of magnetic ion doping, growth conditions, and substrate variation on the structural, optical, and electro-magnetic properties of oxide-based thin films. I have successfully grown thin films of doped ZnO and In$_2$O$_3$ and multilayers of ZnO with Fe$_2$O$_3$ for transparent spintronics using pulsed laser deposition technique. These films were grown using appropriate ceramic targets made by standard solid state reactions. Because the structural and physical properties of the films are sensitive to the deposition conditions, we have optimized the growth conditions to get high quality thin films.
PEER REVIEWED PUBLICATIONS (TOTAL 114)

1. Enhanced corrosion resistance of phytic acid coated magnesium by stearic acid treatment

2. Preparation and characterization of dye sensitized solar cell based on nanostructured Fe₂O₃

3. Corrosion Protective Conversion Coatings on Magnesium Disks Using a Hydrothermal Technique

4. Fabrication and electrical characterization of solution-processed all-oxide transparent NiO/TiO₂ p-n junction diode by sol-gel spin coating method

5. Electrical and photoresponse properties of Al/p-CuFeO₂/p-Si/Al MTCOS photodiode

6. Mechanical and corrosion properties of magnesium-hydroxyapatite (Mg-HA) composite thin films

7. Analysis of device parameters of Al/In₂O₃/p-Si Schottky diode

8. Effect of post heat treatment on corrosion resistance of phytic acid conversion coated magnesium,

9. Fabrication and electrical characterization of transparent NiO/ZnO p-n junction by the sol-gel spin coating method

10. Photodiodes based on graphene oxide-silicon junctions

11. Synthesis and characterization of nanostructured aluminum borate by sol-gel method
12. Preparation of nanostructured Bi-doped CdO thin films by sol gel spin coating method

13. Structural and optical properties of nanostructure CdZnO films
Spectros. 95 (2012) 107

14. Series resistance controlling photosensor of Ag/DNA/p-Si/Al diode
R.K. Gupta, A.A. Al-Ghamdi, O. Al-Hartomi, H. Hasar, F. El-Tantawy, F. Yakuphanoglu,

15. Photoconductive Schottky diode based on Al/p-Si/SnS2/Ag for optical sensor applications

16. Preparation and photocatalytic properties of hybrid core–shell reusable CoFe2O4–ZnO
nanospheres

17. A DNA Biosensor Based Interface States of a Metal-Insulator-Semiconductor Diode for
Biotechnology Applications
A.A. Al-Ghamdi, O.A. Al-Hartomy, R. Gupta, F. El-Tantawy, E. Taskan, H. Hasar, F.

18. Preparation and characterization of nanorods Sb doped CdO films by sol–gel technique

19. Bandgap variation in size controlled nanostructured Li-Ni co-doped CdO thin films

20. Reusable hybride CoFe2O4–ZnO hollow nanosphere photo catalysts
2012, 1406 : mrsf11-1406-z05-68 (7 pages)

21. Photoconducting and electrical properties of Al/p-Si/TIPS-pentacene/Al hybrid diode for
optical sensor applications

22. Bandgap engineering of rare earth element doped nano structured cadmium oxide thin

23. Effects of illumination on capacitance characteristics of Au/3C-SiC/p-Si/Al diode
24. Fabrication and characterization of p-n junction based on ZnO and CuPc

25. p-Si/DNA photoconductive diode for optical sensor applications

26. Epitaxial growth of tin ferrite thin films using pulsed laser deposition technique

27. Matrix-assisted pulsed-laser evaporated polymer films in all organic field-effect transistors and metal-insulator-semiconductor diodes

28. Epitaxial growth of MgFe$_2$O$_4$ (111) thin films on sapphire (0001) substrate

29. Bandgap engineering of nanostructure Cu doped CdO films

30. Vertical exchange bias effects in multilayer thin films based on iron oxide and chromium oxide

31. Structural and magnetic properties of epitaxial SnFe$_2$O$_4$ thin films

32. A novel method to synthesis iron oxide thin films

33. Low temperature processed highly conducting, transparent, and wide bandgap Gd doped CdO thin films for transparent electronics

34. Glucose stabilized ZnO nanoparticles for biomedical applications

35. Structural and magnetic properties of nanostructured iron oxide

36. Structural and magnetic properties of phase controlled iron oxide rods
37. Current-voltage characteristics of p-Si/Carbon junction fabricated by pulsed laser deposition

38. Bandgap engineered high mobility indium oxide thin films for photovoltaic applications

39. Temperature dependence of current-voltage characteristics of gold- strontium titanate junction

40. Effect of Particle Size Distributions on Absorbance Spectra of Gold Nanoparticles

41. Effect of substrate temperature on structural and optoelectrical properties of silver doped zinc oxide thin films

42. Magnetization effects in bulk YFeO$_3$ and their dependency on electric field strength and temperature as a basis for thin film investigation of multiferroic technology

43. Transparent, conducting, and ferromagnetic multilayer films based on ZnO/Fe$_3$O$_4$ by pulsed laser deposition technique

44. Electrical properties of rectifying contacts on selectively carrier controlled grown ZnO thin films

45. Room temperature ferromagnetic multilayer thin film based on indium oxide and iron oxide for transparent spintronic applications

46. Green synthesis of hematite (α-Fe$_2$O$_3$) submicron particles

47. Interface-controlled pulsed-laser deposited polymer films in organic devices

48. Wide bandgap Mg-doped ZnAlO thin films for optoelectronic applications
49. Preparation and characterization of highly conducting and transparent Al doped CdO thin films by pulsed laser deposition  

50. Wide band gap Cd$_{0.83}$Mg$_{0.15}$Al$_{0.02}$O thin films by pulsed laser deposition  

51. Effect of temperature on current-voltage characteristics of Cu$_2$O/p-Si Schottky diode  

52. Fabrication and electrical characterization of Au/p-Si/STO/Au contact  

53. Fabrication and characterization of NiO/ZnO p-n junctions by pulsed laser deposition  

54. Highly conducting and transparent Ti-doped CdO films by pulsed laser deposition  

55. Junction characteristics of pulsed laser deposition grown Gd$_2$O$_3$ on p-Silicon  

56. Thickness dependence of optoelectrical properties of tungsten-doped indium oxide films  

57. Influence of oxygen growth pressure on laser ablated Cr-doped In$_2$O$_3$ thin films  

58. Fabrication and electrical characterization of Schottky diode based on 2-amino-4, 5-imidazole carbonitrile (AIDCN)  

59. Effect of substrate temperature on properties of multilayer thin film based on ZnO and Mo-doped indium oxide  

60. Optoelectrical properties ZnO and W-doped In$_2$O$_3$ multilayer films grown by pulsed laser deposition  

61. Optical, mechanical and electrical studies of polymer composites based on charge transfer complex of phenothiazine-iodine with polyvinylchloride  
62. Synthesis of a new generation of amphiphiles with multi-cryptand headgroups: A comparative study at air-water interface

63. High mobility Ti-doped In$_2$O$_3$ transparent conductive thin films

64. High mobility W-doped In$_2$O$_3$ thin films: Effect of growth temperature and oxygen pressure on structural, electrical and optical properties

65. High mobility, transparent, conducting Gd-doped In$_2$O$_3$ thin films by pulsed laser deposition

66. Structural, optical and electrical characterization of highly conducting Mo-doped In$_2$O$_3$ thin films

67. Band gap engineering of ZnO thin films by In$_2$O$_3$ incorporation

68. Influence of oxygen partial pressure on optoelectrical properties of aluminum-doped CdO thin films

69. Structural, optical and electrical properties of In doped CdO thin films for optoelectronic applications

70. Highly conducting and transparent tin-doped CdO thin films for optoelectronic applications

71. Pulsed laser thin film growth of di-octyl substituted polyfluorene and its co-polymers

72. Effect of oxygen partial pressure on properties of Nb-doped In$_2$O$_3$ thin films

73. Properties of ZnO/W-doped In$_2$O$_3$/ZnO multilayer thin films deposited at different growth temperature

74. Effect of substrate temperature on opto-electrical properties of Nb-doped In$_2$O$_3$ thin films

75. Effect of oxygen partial pressure on optoelectrical properties of tin-doped CdO thin films

76. Effect of oxygen partial pressure on structural, optical and electrical properties of titanium-doped CdO thin films

77. Effect of thickness on optoelectrical properties of Mo-doped indium oxide films

78. Highly conducting and transparent multilayer films based on ZnO and Mo-doped indium oxide for optoelectronic applications

79. Electrical and Magneto-transport properties of Gd-doped \( \text{In}_2\text{O}_3 \) thin films prepared by pulsed laser deposition

80. Electrical and optical properties of gold-strontium titanate nano-composite thin films

81. Effect of growth temperature and annealing on structural and magneto-transport properties of Co-doped \( \text{In}_2\text{O}_3 \) diluted magnetic semiconductors

82. Structural and magneto-transport properties of Cr-doped \( \text{In}_2\text{O}_3 \) diluted magnetic semiconductors

83. Effect of Annealing on rectifying contacts on ZnO thin films grown using pulsed laser deposition

85. Growth and characterization of In$_2$O$_3$ thin films prepared by pulsed laser deposition

86. Opto-electrical properties of Ti-doped In$_2$O$_3$ thin films grown by pulsed laser deposition

87. Some physicochemical studies on organic eutectics

88. Growth kinetics of carbon nanosphere using “green” techniques

89. A study of high quality Al-doped ZnO thin films grown at low temperature by pulsed laser deposition

90. Magneto-transport properties of Gd-doped In$_2$O$_3$ thin films

91. Electrical and optical properties of high mobility W-doped In$_2$O$_3$ thin films

92. Magneto-transport properties of cobalt doped indium oxide dilute magnetic semiconductors

93. Inhibition of corrosion by poly (N-hexadecylamine)/docosanol mixed Langmuir-Blodgett films on copper in sea water

94. Removal behavior of Babool bark (*Acacia Nilotica*) for submicro concentrations of Hg$^{2+}$ from aqueous solutions.

95. Preparation and characterization of polymer composites based on charge-transfer complex:
  o-tolidine-iodine in polystyrene

96. Solid-state organic batteries based on polymer composites of charge-transfer material:
  phenothiazine-iodine with PVC and PS.
97. Fabrication and characteristics of Schottky diode based on composite organic semiconductors.

98. Preparation and characterization of electrically conducting Langmuir-Blodgett films of poly (N-octadecylaniline)

99. Studies on electrochemical cells based on polymer composites of charge-transfer materials

100. Preparation and characterization of polymer composites of polyaniline with poly (vinyl chloride) and polystyrene.

101. Semiconducting properties of charge-transfer complex of naturally occurring compound “protopine” with iodine and its application in solid-state batteries

102. Junction properties of Schottky diode based on composite organic semiconductors

103. Removal of cesium ions from aqueous solution by polyaniline: a radiotracer study

104. Solid-state organic batteries based on polymer composites of charge-transfer materials

105. Preparation and characterization of polymer composites based on charge-transfer complex of Phenothiazine-iodine in polystyrene.

106. Thermochemical and microstructural studies on binary organic eutectics and complexes.

107. Removal of mercury ions from aqueous solutions by composite of polyaniline with polystyrene

108. Electrical properties of junction between aluminium and poly (aniline)-poly (vinyl chloride) composite.

110. Schottky diode based on composite organic semiconductors.  


112. Junction properties of Schottky diode based on composite organic semiconductors:  
polyaniline- polystyrene system.  

113. AC impedance studies on the molecular semiconductors based on aromatic diamines-  
iodine charge-transfer complexes.  

114. Semiconducting mixed Langmuir-Blodgett films of poly (N-hexadecylaniline) with stearic  
acid.  
CONFERENCE/SYMPOSIUM/POSTER/PRESENTATIONS (TOTAL 92)

1. Pulsed Laser Deposition and biocompatibility of titanium nitride coatings
   Talisha M. Haywood, Kwadwo Mensah-Darkwa, Ram Gupta, Dhananjay Kumar,
   Proceedings of the ASME 2012 International Mechanical Engineering Congress &
   Exposition, November 9-15, 2012, Houston, Texas, USA

2. Fabrication and characterization of Hydroxyapatite-Magnesium Composite Thin Films
   on Magnesium plates for Implant Applications
   Kwadwo Mensah-Darkwa, Ram K. Gupta, Dhananjay Kumar, Proceedings of the ASME
   2012 International Mechanical Engineering Congress & Exposition, November 9-15,
   2012, Houston, Texas, USA

3. Development of Ceramic Biomaterial Coatings for Implant Applications,
   Talisha Haywood, Dhananjay Kumar, Kwadwo Darkwa, Ram Gupta, BMES 2012
   Annual Meeting scheduled for October 24-27, Atlanta, Georgia

4. Fabrication and characterization of Metallo-Ceramic Composite Films For Bone Implant
   Applications
   Kwadwo Mensah-Darkwa, Dhananjay Kumar, Ram Gupta, BMES 2012 Annual Meeting
   scheduled for October 24-27, Atlanta, Georgia

5. Electrochemical Impedance Spectroscopy (EIS) Studies on Magnesium-Hydroxyapatite
   Composite Coating for Bioimplants
   Kwadwo Mensah-Darkwa, R. K. Gupta, D. Kumar, European –Materials Research
   Society, Central Campus of Warsaw University of Technology (Poland), September 17-
   21, 2012

6. Environment friendly corrosion resistive coating on magnesium using phytic acid
   R.K. Gupta, Kwadwo Mensah-Darkwa, D. Kumar, European –Materials Research
   Society, Central Campus of Warsaw University of Technology (Poland), September 17-
   21, 2012

7. Fabrication, characterization, and mechanism of vertically aligned untapered titanium
   nitride nanowires
   M. Faruque, T. Haywood1, K. M-Darkwa1, C. Watson, R. Gupta, C. Waters, J.
   Waterman, D. Kumar, Materials Research Society Meeting, San Francisco, California,
   April 09-13, 2012

8. Preparation and photocatalytic properties of hybride core-shell reusable CoFe2O4-ZnO
   nanospheres
   A. Wilson, S.R. Mishra, R. Gupta, K. Ghosh, Materials Research Society Meeting,
   Boston, MA, November 28 - December 2, 2011
9. Magnetic properties of chromium and cobalt doped indium oxide dilute magnetic semiconductors

10. Anomalous magneto-resistance behavior in Co-doped In$_2$O$_3$ thin films

11. Interface-controlled polymer dielectric interfaces for improved organic device performance

12. Synthesis of cobalt nanoparticles for biomedical applications

13. Magnetic properties of yttrium garnet for spin-electronics applications

14. Synthesis and characterization of cobalt nanoparticles for biomedical applications

15. Investigation of YFeO$_3$ thin films for use as a multiferroic material in spintronic applications
A. P. Hinckley, Ram Gupta, Yesappa Kolekar, Pawan Kahol, K. Ghosh, Interdisciplinary Research Forum, Missouri State University, MO, April 2, 2011

16. Structural and magnetic properties of yttrium iron garnet for spintronic applications

17. Transition metal doped oxide dilute magnetic semiconductors for spintronic applications
Michelle Langhoff, K. Ghosh, Y. Kolekar, R. Gupta, CNAS Undergraduate Research Day, Missouri State University, March 25, 2011

18. Spintronic applications using chromium doped indium oxide

19. Transparent Spintronics using Pulsed Laser Deposition Technique
20. Thin Film Study of YFeO₃ Deposited Via Pulsed Laser Deposition for use in spintronic applications

21. Studies on magneto-transport properties of dilute magnetic semiconductors

22. Pulsed Laser Synthesized Magnetic Cobalt Oxide Nanoparticles for Biomedical Applications

23. Studies on manganese substituted cobalt ferrite prepared by auto combustion route

24. Structural and magnetic properties of Cr and Co doped indium oxide dilute magnetic semiconductors

25. Low temperature processed highly conducting, transparent, and wide bandgap gadolinium doped CdO thin films for optoelectronics
   R.K. Gupta, K. Ghosh, R. Patel, P.K. Kahol, MRS Fall meeting-2010, Boston, MA, USA, November 29- December 03, 2010

26. Magnetization Effects in bulk YFeO₃ and their dependency on electric field strength and temperature as a basis for thin film investigation of Multiferroic Technology.
   A. Hinckley, R.K. Gupta, P.K. Kahol, K. Ghosh, MRS Fall meeting-2010, Boston, MA, USA, November 29- December 03, 2010

27. Bandgap engineered high mobility indium oxide thin films for photovoltaic applications
   R.K. Gupta, K. Ghosh, P.K. Kahol, MRS Fall meeting-2010, Boston, MA, USA, November 29- December 03, 2010

28. Synthesis of Mn substituted cobalt ferrite by auto combustion route: their study

29. Transition Metals Doped Indium Oxide for Spintronics Applications
30. Magnetic properties of perovskite yttrium orthoferrite
   Conference, Norman, Oklahoma, October 9-10, 2010

31. Nanoscale investigation of domain dynamics in mutiferroic thin films using scanning
   probe microscopy
   K. Ghosh, R. Gupta, Y. Kolekar, A. Hinckley, P. Kahol, T. Bontgen, M. Lorentz, M.
   Grundmann, The 56th Midwest Solid State Physics Conference, Norman, Oklahoma,
   October 9-10, 2010

32. Synthesis and characterization of manganese and cobalt oxide nanoparticles for
   biomedical applications
   Midwest Solid State Physics Conference, Norman, Oklahoma, October 9-10, 2010

33. Studies on (Co,Ni)Fe_{1.9}Mn_{0.1}O_{4} and PMN-PT magneto-electric composites
   State Physics Conference, Norman, Oklahoma, October 9-10, 2010

34. Transition Metals Doped Indium Oxide for Spintronics Applications
   Midwest Solid State Physics Conference, Norman, Oklahoma, October 9-10, 2010

35. Characterization of Fe_{3}O_{4} nanoparticles hydrothermally treated in the presence of Ni^{2+}
   Zn^{2+} and Co^{2+} to 400 °C
   Naveen Dharmagunawardhane, Hao Yan, Joseph Demster, Robert Mayanovic, Ram
   Gupta, The 56th Midwest Solid State Physics Conference, Norman, Oklahoma, October 9-10,
   2010

36. High quality diluted magnetic semiconductors films grown by Pulsed Laser Deposition
   Science, Springfield, Missouri, USA. April 17, 2010

37. Effect of growth condition on properties of Co-doped In_{2}O_{3} diluted magnetic
   semiconductors
   A. Ghosh, R. K. Gupta, T. Williams, K. Ghosh, P. K. Kahol, Missouri Academy of
   Science, Springfield, Missouri, USA. April 17, 2010

38. Fabrication and characterization of p-n junction based on ZnO and CuPc
   April 5-9, 2010

39. Effect of growth condition on properties of Cr-doped In_{2}O_{3} films
   N. Ukah, R. K. Gupta, G. Aboagge-Asare, K. Ghosh, P. K. Kahol, College of Natural and
   Applied Science, Research/Creative Activity Day, Missouri State University, Springfield,
   MO, March 26, 2010
40. High Quality Co-Doped In$_2$O$_3$ Dilute Magnetic Semiconductors for Spintronic Applications

41. Applications of interface controlled pulsed-laser deposited polymer films in field-effect transistors
Danish Adil, Ndubuisi Ukah, Suchi Guha, Ram Gupta, Kartik Ghosh, The American Physical Society, March 10, 2010

42. Mechanochemical synthesis of nanocrystalline YFeO$_3$ and its magnetic properties

43. Mechanochemical synthesis of Co$_3$O$_4$-CuO antiferromagnetic nanocomposite powder and its magnetic properties

44. Structural and magneto-transport properties of Co-doped In$_2$O$_3$ diluted magnetic semiconductors

45. Controlled sized ZnO nanoparticles for biomedical applications

46. Formation of rectifying contacts on ZnO thin films using pulsed laser deposition
A. Bhattacharya, P. Kahol, R. Gupta, K. Ghosh, Interdisciplinary Forum, Missouri State University, April 18, 2009

47. Composite dielectric materials for non-volatile memory applications
Y. Dhopade, K. Ghosh, M. Manivannan, R. Gupta, P. Kahol, Interdisciplinary Forum, Missouri State University, April 18, 2009

48. Synthesis and characterization of ZnO nanoparticles for bio-medical applications
49. Effect of growth temperature on structural and magneto-transport properties of Co-doped In$_2$O$_3$
A. Ghosh, K. Ghosh, Interdisciplinary Forum, Missouri State University, April 18, 2009

50. Growth and characterization of chromium doped indium oxide diluted magnetic semiconductors
N. Ukah, R. Gupta, K. Ghosh, Interdisciplinary Forum, Missouri State University, April 18, 2009

51. Effect of doping density, growth temperature and partial oxygen pressure on structural, electrical, and magnetic properties of cobalt doped indium oxide thin films

52. Synthesis and characterization Cr-doped In2O3 dilute magnetic semiconductor films

53. Oxygen pressure controlled growth of rectifying contacts on ZnO films and its usage towards photovoltaic effect.

54. Effect of growth temperature and annealing on structural and magneto-transport properties of Co-doped In$_2$O$_3$ diluted magnetic semiconductors

55. Structural and magneto-transport properties of Cr-doped In$_2$O$_3$ diluted magnetic semiconductors

56. Electrical and optical properties of gold-strontium titanate nano-composite thin films

57. A novel approach to synthesis and characterization of biocompatible ZnO nanoparticles

58. Effect of annealing on rectifying contacts on ZnO thin films grown using pulsed laser deposition
A. Bhattacharya, R.K. Gupta, P.K. Kahol, K. Ghosh, MRS Fall meeting, Boston, MA, USA. December 1-5, 2008
59. Synthesis and characterization of ZnO nanoparticles: An effective tool for biomedical applications

60. Development of a novel technique to create a wide variety of nanoparticles using pulsed laser deposition

61. Cobalt doped indium oxide dilute magnetic semiconductors for spin-electronic applications

62. Organic solar cells

63. ZnO nanoparticles for bio-medical applications

64. Growth and characterization of gold-strontium titanate nanocomposites for sensing applications

65. Fabrication of Schottky barrier based organic solar cells

66. Growth and characterization of gold-strontium titanate nanocomposites for sensing applications

67. Cobalt doped indium oxide dilute magnetic semiconductors for spin-electronic applications

68. Synthesis and characterization of ZnO nanoparticles for bio-medical applications
69. Magneto-transport properties of Gd-doped In$_2$O$_3$ thin films  

70. Magneto-transport properties of cobalt doped indium oxide dilute magnetic semiconductors  

71. Magneto-transport properties of Gd-doped In$_2$O$_3$ thin films  

72. Electrical and optical properties of high mobility W-doped In$_2$O$_3$ thin films  

73. A study of high quality Al-doped ZnO thin films grown at low temperature by pulsed laser deposition  

74. In Situ polymerization of aniline in the presence of carbon nanotubes to form nanocomposite with enhanced electrical conductivity  

75. Growth and characterization of nanocomposite thin films for infra-red detection  

76. Transparent conducting oxide thin films for optoelectronic applications  

77. Synthesis and electrical properties of carbon nanotubes/polyaniline nanocomposites  
V. Kandagor, R.K. Gupta, P. Kahol, L. Dong, MAPT Meeting, Missouri State University, Springfield, MO, USA. October 27, 2007

78. Gold-carbon nanocomposite for switching and memory devices  

79. Cobalt doped indium oxide thin films for the magneto-optical applications

80. A novel method for fabrication of carbon-based semiconductors

81. Fabrication of spin valve organic light emitting devices

82. Growth and characterization of gold nanoparticles for biosensor application

83. Self assembly of oxide nano-structures using pulsed laser deposition

84. Growth and characterization of nanosize Co-doped ZnO dilute magnetic semiconductors

85. Highly conducting and transparent ZnAlO thin film for organic light emitting diodes

86. Biosensor design and fabrication using gold nanoparticles

87. Synthesis of nanostructured spintronic materials using pulsed laser deposition

88. Electrical Properties of Langmuir- Blodgett Films based on Composites of N-octadecyl-p-phenyldiamines with stearic Acid


Charles (Jody) Neef, Ph.D.
Assistant Professor – Department of Chemistry

104 Heckert-Wells
Pittsburg State University
1701 South Broadway
Pittsburg KS 66762

Work: (620) 235-4494
Cell: (512) 629-2783
Email: cneef@pittstate.edu

Professional Experience

August 2012-Present: Assistant Professor in the Department of Chemistry at Pittsburg State University
- Taught Organic chemistry, Advanced Organic Chemistry, and Polymer chemistry
- Revised/updated Organic Chemistry Laboratory curriculum
- Research interests included electroactive polymers as biosensors and energy storage devices
- Responsible for $110,000 in donations and funding to the Chemistry Department
- Served on numerous university committees
- One paper published and one in preparation

March 2011-July 2012: Program Faculty Member in the Department of Chemistry and Biochemistry, Texas State University, San Marcos, TX
- Responsible for $22,000 of funding to Texas State University
- Taught first and second semester organic chemistry [student evaluation scores (90%) were consistently higher than departmental average (ca. 80%)]
- Volunteered for the Financial Committee for the ACS Southwest Regional Meeting
- Research in the areas of electroactive polymers and nanocomposites
- Assisted undergraduate students with their research, writing and undergraduate research grant proposals
- Worked with small businesses on DoD SBIR and STTR solicitations
- One paper accepted published

August 2009-March 2011: Program Faculty Member in the Institute of Environment and Industrial Science, Texas State University, San Marcos, TX
- Assisted in $160,000 of funding to Texas State University
- Worked with small businesses on DoD SBIR and STTR solicitations
- Taught first and second semester organic chemistry
- Invented new thermal barrier coatings for fire protection
- Performed microencapsulation experiments in carbon dioxide
- One patent

June 2000 – March 2009: Scientist, Brewer Science, Inc., Rolla, MO
- Managed projects for Antireflective coatings (ARCs) for the Semiconductor industry
- Designed and synthesized new materials and formulations for dry etch and wet developable ARCs
- Worked with polyacrylates, polyamic acids, thermoset materials, and sol-gel materials
- Five new material platforms reach commercialization
- Received five patents and published eight papers

December 1996 - May 2000: Research Associate, University of Texas at Dallas, Richardson, TX
- Performed research on polythiophenes and polyphenylene vinylenes
- Five published papers and one patent

October - November 1996: Consultant for Wallace, Inc., Seminole, OK
- Worked with water impermeable materials for oilfield applications
- Two patents
Educational Background:
Ph.D. in Organic Chemistry, 1996
The University of Oklahoma, Norman, OK
Dissertation Title: Synthesis, Preparation, and Electronic Properties of Ferrocene-Containing Polymers and Composites
Major Advisors: Drs. Kenneth M. Nicholas and Daniel T. Glatzhofer

M.S. in Chemistry, 1990
Texas State University, San Marcos, TX
Thesis Title: Copoly(Imidine-Esters): Monomer and Polymer Synthesis
Major Advisor: Dr. Patrick E. Cassidy

B.S. in Chemistry, 1987
Texas State University

Teaching Experience
Fall 2012 – Present: Organic Chemistry [first and second semester] and Polymer Chemistry in the Department of Chemistry at Pittsburg State University

Fall 2009 – Spring 2012: Organic Chemistry [first and second semester] in the Department of Chemistry and Biochemistry at Texas State University

1997 - 2000: Substituted for Dr. John Ferraris in his Polymer Chemistry course upon his absence from the University of Texas at Dallas.

1993 - 1994: Head Teaching Assistant, University of Oklahoma, Norman, OK
Duties included coordination of teaching assistants, anticipation and problem solving within the laboratories, preparation and dissemination of quizzes, and grading exams.

1991 - 1993: Teaching Assistant, University of Oklahoma, Norman, OK
Responsibilities involved teaching undergraduates in microscale organic chemistry

Publications


Oral Presentations
ACS MoKanOk Sectional Meeting, Applications of Electroactive Polymers, November 2012

Poster Presentations
A. Alzharani, E. Allehyani, and C.J. Neef, Effects of Electrolyte on the Redox Properties of Ferrocene Containing Polymers, ACS Pentasectional meeting in Tulsa, OK, 8 March 2013

D. Base and C.J. Neef, Use of \( \text{Thiazostilbene} \) as an Electron Acceptor in D-A-D Systems with Thiophene, Pittsburg State University Research Colloquium, 15 April 2013

Patents


Proposals

Pittsburg State University - Undergraduate Research Agreement, Novel Copolymers Derived from Vinlyferroccenes and Styrenic Monomers, April 2013, Funded - $1,875

Pittsburg State University - College of Arts and Sciences Student Equipment Fees, Request for Organic Laboratory Glassware, March 2013, Funded - $10,000
K-INBRE Recruitment/Start-up Proposal, Biosensors Derived from Ferrocene Containing Polymers, January 2013, **Funded** - $30,100


Pittsburg State University - Summer Teaching Enhancement Grant, *Revision and Update to the Organic Chemistry Laboratories*, September 2012 - **Funded**
Jeanne H. Norton (formerly Jeanne N. Shera)

Work Experience

Assistant Professor-Plastic Engineering Technology
- Plan, produce and grade course materials for plastics engineering courses
- Perform independent and collaborative research with KPRC

Instructor-Plastic Engineering Technology 374 Laboratory
- Plan, produce and grade course materials for PET 374
- Direct laboratory activities for Thermoset Resins students

Research Associate-Kansas Polymer Research Center
- Synthesize and evaluate bio-based polyester pre-polymers for use in thermoplastic polyurethanes
- Functionalize and characterize corn oil for use in vegetable-oil based polyols

Postdoctoral Research Associate
- Synthesize and evaluate amphiphilic peptides for differences in rheological and surface properties based on peptide sequence
- Characterize algal cell morphology and identify internal structures to differentiate between algal lipid bodies and the algal protein matrix
- Co-manage the BioMaterials and Technology Lab and oversee lab safety

Education

Doctorate in Polymer Science and Engineering
- 5/2002 — 5/2007 The University of Southern Mississippi Hattiesburg, MS
- Dissertation: Soy Protein Isolate Molecular Level Contributions to Bulk Adhesive Properties

Master's Degree in Polymer Science and Engineering
- 8/1999 — 4/2002 The University of Southern Mississippi Hattiesburg, MS
- Thesis: Organic-Inorganic Nanocomposites Templated by Lyotropic Liquid Crystals

Bachelor's Degree in Chemistry
- 8/1995 — 5/1999 Ripon College Ripon, WI

Skills
- Synthetic chemistry including peptide synthesis and polyol synthesis
- Formulation and testing of cast polyurethanes and polyurethane foams
- Infrared spectroscopy, Circular dichroism spectroscopy and Nuclear magnetic resonance spectroscopy
- High performance liquid chromatography and Gas chromatography
- Gel permeation chromatography
- Optical microscopy, Scanning and Transmission electron microscopy
- Thermogravimetric analysis and Differential scanning calorimetry
Other

Professional Activities

- Writing and submitting research proposals
- Mentoring and training REU students
- Supervising and directing undergraduate lab workers

Patents and Publications


Selected Presentations

- Shera, Jeanne N.; Rawlins, James W.; Thames, Shelby F. Formulation and Aging of Soy Protein-Based Adhesive Characterized by ATR-IR Spectroscopy, 97th AOCS Annual Meeting and Expo, St. Louis, MO, April 30-March 3, 2006.
- Shera, Jeanne N.; Becker, Timothy S.; Boyle, Dan; Szoszkiewicz, Robert; Yuan, Wenqiao; Sturm, Belinda; Smith, Val; Sun, XiuZhi Susan, Determination of Protein and Lipid Distribution within Algal Cells and Algal Cell Micromechanics, 18th Annual BioEnvironmental Polymer Society Annual Meeting, Toronto, Ontario, Canada, Oct. 13-15, 2010.

Affiliations

- American Chemical Society (Chair-Elect 2013 for the MO-Kan-OK Tristate Section)
- American Oil Chemists' Society
- BioEnvironmental Polymer Society
Santimukul Santra, Ph.D.
Assistant Professor

Department of Chemistry, Pittsburg State University, 225L Whitesitt Hall, Pittsburg, KS 66762. Office # 620-235-4861, Fax # 620-235-4003. Email: ssantra@pittstate.edu

OBJECTIVE

A challenging academic position in the area of polymer synthesis / organic chemistry / material science / nanochemistry / nanotheranostics / nano-biotechnology / drug delivery / nanomedicine / systems biology.

EXPERTISE

Blend of expertise in cancer and infectious disease targeting, drug delivery, nano-biotechnology, nanomaterial synthesis, characterizations and functionalization, material science, biomaterials, organic chemistry specialized in biocompatible polymer synthesis, organic synthesis to address the critical medical problems associated with Human health.

My extensive expertise can be categorized into the following broad interdisciplinary areas:

ORGANIC SYNTHESIS and BIOCOMPATIBLE POLYMER SYNTHESIS:

More than 12 years of expertise in multi-step organic synthesis, aliphatic polymer synthesis: linear, hyperbranched and dendrimer / Amino acid-based polymer synthesis / Designer amorphous, porous and biocompatible polymer synthesis/ linear polyacrylates and its derivative polymer synthesis / polystyrene synthesis / polyacrylamide polymers and hydrogels synthesis / Free radical polymerizations / Multi-step, air and moisture sensitive organic synthesis / nanochemistry / Material science / column chromatography / NMR / MASS / FT-IR / UV-VIS / Fluorometer / GPC / TGA / DSC

NANO-BIO TECHNOLOGY:

More than 6 years of expertise in synthesis of nanomaterials for targeted drug delivery: Polymeric, Iron oxide, Cerium oxide, Gold nanoparticles / Bioconjugation, click chemistry / Activatable MRI probes for cancer imaging / Activatable theranostic prodrugs for cancer treatment / Nanomaterial-drug formulation / Fluorescence and Confocal microscopy / FACS / DLS / Magnetic relaxometer / STEM / TEM / Zetasizer / Tissue culture / In Vitro cell-based assay development

DETECTION AND TREATMENT OF MALIGNANT CARCINOMAS AND INFECTIOUS DISEASES:

More than 5 years of expertise in Nanotheranostics / Cancer targeting, imaging and treatment: Lung, Prostate, Breast, Ovarian, colon and Cervical / Infectious disease detection: Cholera, Anthrax, Pathogens, Bowel diseases and other infectious diseases / Medical devices / Nanomedicine / Nanosensing / Bioimaging / In Vivo imaging / IVIS / FMT / X-Ray / CT / MR Imaging

EMPLOYMENT PROFILE

2013 - Present  Assistant Professor. Department of Chemistry, Pittsburg State University, Pittsburg, KS.

2011 - 2012  Research Assistant Professor. Nanoscience Technology Center, University of Central Florida, Orlando, FL.

2007 - 2010  Postdoctoral Research Associate. Nanoscience Technology Center, University of Central Florida, Orlando, FL.


EDUCATION

Thesis Title: "Design and Syntheses of Functional Biopolymers Based on 2, 2'-Bis(hydroxymethyl) Propionic Acid, Malonic Acid and β-Alanine"

1998 - 2000  M. Sc. in Organic Chemistry. Department of Chemistry (2nd topper), Banaras Hindu University (BHU), Varanasi, India.

PROFESSIONAL INTEREST

Nanotechnology-based theranostics for targeted cancer therapy, nanosensors for the detection of single cancer cells in blood circulations / pathogens / toxins / anthrax / Bowel diseases and other infectious diseases, optical / MRI / X-ray-CT imaging of malignant tumors, activatable nanotheranostics for the targeted imaging and treatment of cancers.

- Biologically active small molecules / drugs design, synthesis and purification
- Biodegradable linear and dendritic polymer design, synthesis and characterizations
- Amino acid-based biocompatible linear and hyperbranched polymer synthesis
- Aliphatic, amorphous, porous biopolymer synthesis, characterizations and applications
- Polyacrylates, polyacrylamides, polystyrene polymers and hydrogels synthesis
- Nanomaterials, peptide and biomolecules functionalizations: Click chemistry, EDC, CDI, DCC couplings
- Water-based bioconjugation chemistries: Click and carbodiimide
- Water-based nanoparticle formulation techniques: Solvent diffusion, evaporation and emulsion
- Receptor targeting theranostic nanomaterials synthesis: Polymeric and metallic (Fe, Ce & Au)
- Molecular encapsulations and functionalizations: drugs, dyes, peptides and oligos
- Nanotechnology-based Targeted detection, non-invasive imaging and treatment of malignant carcinomas
- Co-synergistic effects of cytotoxic drugs and peptides to trigger malignant tumor death
- Design and synthesis of activatable pro-theranostics: Prodrug, MRI/X-ray/CT contrast agents for cancer treatment
- Magnetic nanosensors for the detection of circulating single cancer cells in complex media: blood and milk
- Nanosensor-based rapid and sensitive detection of Anthrax Lethal Factor and other infectious diseases
- Nanosensing of Bowel’s diseases: Crohn’s and John’s diseases
- Nano-devices for the detection of chronic inflammations and cancer biomarkers
- Magnetic relaxation technology for the detection of microbial pathogens and cholera diagnostics
- Nanomedicines, nanosensing, nanotoxicology, nanobioimaging

PATENTS


4. J. M. Perez, C. Kaittanis, A. Asati, S. Santra “A cerium-oxide-nanoparticle-based device for the detection of reactive


### PEER REVIEWED PUBLICATIONS

Total Impact Factor >175, Total Citations > 400, and few more manuscripts are under preparation.


* Featured as very important paper *Selected for cover picture of the journal *Featured in ACS Chemical & Engineering News Magazine *Invited by ACS Communication office for Media coverage *Posted on National Institute of General Medical Science (NIH) website.


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**SPECIFIC SKILLS AND PROFICIENCY**

- **Organic synthesis:** Designer biopolymer synthesis
  - Multi-step air and moisture sensitive reactions, schlenk-line techniques, TLC and Column chromatography.
  - Design and synthesis of biologically active small molecules.
  - Linear, hyperbranched, dendritic polymer, polyacrylates, polyurethanes, hydrogels synthesis and purifications.
  - Melt, solution, free radical, emulsion polymerizations, convergent and divergent growth approach.

- **Nanotechnologies for controlled drug delivery**
  - Nanoparticle and microparticle synthesis: solvent diffusion, evaporation, sol-gel, emulsion techniques.
  - Physico-chemical modifications with antibodies, small molecules, bioconjugation chemistry, click chemistry.
  - Molecular encapsulation of drugs, dyes, peptides and contrast agents.

- **Analysis and characterization**
  - Physico-chemical characterizations of nanoparticles (dynamic light scattering, zeta potential, magnetic relaxation)
  - Analytical techniques (NMR, ES-MS, FT-IR, UV-Vis, Nano-drop, Fluoremeter, Micro-titer plate reader, GPC, TGA, HPLC, PD-10 column, sephadex column, Kros Flo purification)
  - Microscopy (Optical, SEM, STEM, TEM)

- **In vitro cell culture and molecular biology**
  - Cell culture (human, murine and bacterial cell lines)
  - In vitro cell-based assays: cytotoxicity, lyso-tracking, inflammatory response, oxidative stress (MTT, MTS, XTT, ELISA, LDH, BCA and assay development)
  - Assessment of cell - nanoparticle interactions (Fluorescence and confocal microscopy, flow cytometry)
  - Molecular biology techniques: Genomic DNA isolation, purification, Agarose gel electrophoresis.
• **In vivo manipulation**
  - Mouse and rat manipulation (Special training from Memorial Sloan-Kettering Cancer Center-MSKCC, New York. tumor implantation, treatment, dissection and imaging).
  - Biodistribution study in real-time of fluorescent nanoparticles, optical imaging of small animals: Odyssey Imaging system, Fluorescence Molecular Tomography (FMT), IVIS 50 Imaging System.

**TEACHING EXPERIENCE**

2013-2014 CHEM 720 Advanced Polymers at the Pittsburg State University

2013-2014 CHEM 326 Organic Chemistry Lab at the Pittsburg State University

2010-2011 Nano-Biotechnology and Bioimaging classes, with Prof. J. M. Perez, for undergraduate and graduate students in the University of Central Florida, Orlando, FL, USA.

2001-2002 Organic reactions & mechanism and Stereochemistry classes for B. Tech. students in Indian Institute of Technology, Bombay, India.


**MANAGERIAL EXPERIENCES**

- **GRANT WRITING:** Extensive work experience to design and write new grant proposals to bring fundings from NIH, NSF, ARMY and other federal grant agencies.

- **RESEARCH TRAINING:** Experienced in mentoring a team of 12 multi-disciplinary Ph. D. students and scientists to build high quality research platforms focusing on novel polymeric nanomaterial synthesis, detection and treatment of cancers, pathogens and other infectious diseases. Responsible to develop and continue an interdisciplinary working spirit in lab. Working closely with the students to supervise and providing proper guidance on their research projects and results.

- **BRAINSTORMING NEW PROJECTS:** Designing new projects and schemes for cutting-edge research in the lab, including novel polymer design, synthesis and their detail characterizations. Novel amino acid-based small molecules and polymers syntheses. Trouble-shooting all the research related problems in the lab.

- **RESEARCH:** Synthesis of new biodegradable polymers and nanomaterials specifically for targeted cancer therapy including lung, breast and prostate cancer. Design and synthesis of novel nanotechnology based theranostic drug delivery systems, including new polymeric, iron oxide and nanoceria. Detection and treatment of Cholera toxins, tetanus toxins and other infectious disease.

- **MANUSCRIPT AND LAB REPORT WRITING:** Manuscript writing to publish in a peer reviewed journal. Biweekly research report and daily lab notebook writing.

- **LAB SETUP AND MAINTENANCE:** Setting up synthetic lab suitable for performing air and moisture sensitive organic reactions, polymer synthesis and nanoparticle research. Setup and maintenance of cell culture labs. Responsible for ordering lab chemicals, instruments and supplies, keeping updated chemical inventory, MSDS database, chemical and bio-hazard waste management. Attending and presenting in international conferences, organizing weekly journal club.

- **Expertise in synthesis and fabrication of novel drug delivery systems-based on nanomaterials, synthesis, purification and characterizations of polymeric and metallic nanoparticles.** Experienced in bioconjugation chemistry and click chemistry for the surface immobilization / functionalizations with peptides and small molecules for targeted delivery.

- **Extensive experience in organic and material synthesis:** Air and moisture sensitive multi-step organic reactions, biodegradable polymer synthesis, linear and hyperbranched polymer synthesis, polycrylates, polystyrenes, polyacrylamide polymers, hydrogels synthesis, free radical polymerizations, multi-step dendrimer synthesis, amino acid-based linear and hyperbranched polymer synthesis, purifications and characterizations.

- **Excellent skills on column chromatography and thin layer chromatography, polymer purifications, nanomaterial formulation and purification techniques, molecular encapsulation techniques, DNA isolation and purification, gel electrophoresis, drug screening, cell culture techniques, cytotoxicity assays and other cell-based assays.**
Hands-on expertise and excellent command on data processing and analysis for several core instruments: NMR, Mass, FT-IR, UV and fluorescence spectroscopy, FACS, confocal microscopy, fluorescence spectroscopy, assay development.

AWARDS AND HONORS

2012-2012 Best Oral Presentation Award, NanoFlorida Symposium 2012, USF, Tampa.
2010-2011 Recognition from American Chemical Society for substantial contribution as author and reviewer.
2010-2010 Best Poster Presentation Award, NanoFlorida Symposium 2010, UCF, Orlando.
2000-2002 Awarded Teaching Assistant Fellow, Indian Institute of Technology (IIT), Bombay, India.
2000-2001 Qualified Graduate Aptitude Test in Engineering (GATE) for national graduate fellowship.

REVIEWER OF THE FOLLOWING JOURNALS

- ACS Applied Materials & Interfaces (Invited)
- Langmuir (Invited)
- Colloids and Surfaces B: Biointerfaces (Invited)
- Journal of Nanoparticle Research (Invited)
- Molecules (Invited)
- IEEE Transactions on Information Theory (Invited)
- International Journal of Nanomedicine (Invited)
- Current Nanoscience (Invited)

REVIEWER OF THE FOLLOWING RESEARCH GRANTS

- Research proposal/grant reviewed for Swiss National Science Foundation (Invited).

JUDGE OF THE FOLLOWING RESEARCH COLLOQUIUM

- 2013 Research Colloquium and Seminars at the Pittsburgh State University for Graduate and Continuing Studies

PROFESSIONAL AFFILIATIONS

2009-Present Member, American Chemical Society (ACS)

SELECTED CONFERENCE PROCEEDINGS AND PRESENTATIONS

14. "Gadolinium-Encapsulating Iron Oxide Nanoprobe as Activatable NMR/MRI Contrast Agent" NanoFlorida Symposium 2012 (Best Oral Presentation Award winner).
12. "Biodegradable hyperbranched polyester: A new building block in the construction of multifunctional nanoparticles"
and nanocomposites for targeted cancer therapy and imaging" The 239th American Chemical Society National Meeting and Exposition at San Francisco, California, March 2010 (Invited Talk).

11. “Aliphatic Hyperbranched Polyester: A New Building Block In the Construction of Multifunctional Nanoparticles and Nanocomposites” NanoFlorida Symposium 2010 (Best Poster Presentation Award winner).


4. “Synthesis of Bis-MPA based aliphatic polyurethane homodendrimers” International Conference MACRO 2004 at Trivandrum, India, December 2004 (Poster).


2. “Synthesis and characterization of aliphatic hyperbranched polyester based on diethyl malonate and Bis-MPA” RSC-West India Section’s 1st Students Symposium at NCL-Pune, India, September 2003 (Invited Talk).


REFEREES

1. Prof. J. M. Perez, Ph. D. (Mentor, Postdoc) Associate Professor Nanoscience Technology Center University of Central Florida 12424 Research Parkway, Suite 400 Orlando, FL 32826, USA. Phone: 001-407-882-2843 Email: jmperez@ucf.edu

2. Prof. Jan Grimm, M.D., Ph. D. (Collaborator, Postdoc) Radiologist Molecular pharmacology and chemistry program Memorial Sloan-Kettering Cancer Center 417 East 68, ZRC-2003 New York, NY 10065, USA. Phone: 001-646-888-3095 Email: grimmj@mskcc.org

3. Prof. Anil Kumar, Ph. D. (Supervisor, Ph. D.) Professor Department of chemistry Indian Institute of Technology – Bombay Powai, Mumbai 400076, India. Phone: 022-2576-7153 Email: anilkumar@iitb.ac.in

4. Prof. Annette Khaled, Ph. D. (Collaborator, Postdoc) Associate Professor Burnett School of Biomedical Sciences College of Medicine, University of Central Florida 6900 Lake Nona BLVD, Orlando, FL 32827, USA. Phone: 001-407-266-7035 Email: Annette.Khaled@ucf.edu
CURRICULUM VITAE

WILLIAM McNULTY SHIRLEY

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HOME ADDRESS

10880 NE 73rd Street
Pittsburg, Kansas 66762
Phone and Fax: (316) 232-1266

PROFESSIONAL EXPERIENCE

2000-Present  Professor of Chemistry, Department of Chemistry, Pittsburg State University, Pittsburg, Kansas.


1992-2000  Associate Professor of Chemistry, Department of Chemistry, Pittsburg State University, Pittsburg, Kansas.

1989-1992  Assistant Professor of Chemistry, Department of Chemistry, Pittsburg State University, Pittsburg, Kansas.

1982-1989  Assistant Professor of Chemistry, Department of Chemistry, Wichita State University, Wichita, Kansas.


EDUCATION


B.A., Vanderbilt University, 1971, Chemistry.

GRANTS

"Conversion of Soybean Oil to Triglyceride Ethers by Thionation-Desulfurization," $100,000, 2013 (CO-PI with M. Srinivasan)

"Preparation of High Oleic Soybean Oil by Selective Hydrogenation," $100,000, 2013 (CO-PI with A. Zlatanic and Z. Petrovic)

"Extension of Biobased Adhesive project for the Kansas Soybean Commission running from July 1, 2009 to July 1, 2010." $50,000 (CO-PI with Ivan Javni).


"Characterization of Transition Metal Carbonyls and Thiocarbonyls on Catalyst Supports," Research Corporation, 1990, $22,000.

"The Characterization of Supported Transition Metal Carbonyls," The Petroleum Research Fund, American Chemical Society, Type G, Grant #16239-GB5, 1984-86, $15,000. Supplement: Summer Research Fellowship, 1985, $2,000.


One of four Faculty contributors to:
"Purchase of a Fourier Transform Nuclear Magnetic Resonance Spectrometer," National Science Foundation, 1985, $100,000.

MEMBERSHIP

American Chemical Society (Chairman: the Tri-State Mo-Kan-Ok local section, 1995-96)
PUBLICATIONS


W. M. Shirley and S. P. Scoville, "Diffuse Reflectance Infrared and Temperature-Programmed Decomposition Studies on (eta-6-Benzene)tricarbonylchromium(0) and (eta-6-Anisole)tricarbonylchromium(0) on NaX Zeolite," Microporous and Mesoporous Materials, 37, 271 (2000).


APPENDIX B

DOCUMENTATION OF DISCUSSIONS WITH IMPACTED DEPARTMENTS
Polymer Chemistry Degree

From: Tim Thomas <tthomas@pittstate.edu>       Thu, Aug 29, 2013 08:42 AM
Subject: Polymer Chemistry Degree
   To: Bruce Dallman <bdallman@pittstate.edu>
   Cc: Karl Kunkel <kkunkel@pittstate.edu>

Bruce;

ETECH/PET recommends support of the Polymer Chemistry curriculum as shown in the attached "POLYMER CHEMISTRY MAJOR, PROPOSED CURRICULUM, AUGUST 28, 2013" version of the curriculum.

This curriculum includes PET 370/371 Thermoplastic Resins & laboratory, and PET 374/375 Thermoset Resins & laboratory as required courses in the curriculum and includes PET 373/372 Plastic Processing I & laboratory as a recommended elective course.

Inclusion of these courses gives the degree an industry applications component which our industry constituents have indicated is critical to the program and enhances the Bachelor degree graduates employability.

Tim Thomas
Professor/Chair
Engineering Technology
W215, KTC
1701 S. Broadway
Pittsburg State University
620.235.4353, ph
620.235.4004, fx

Polymer Chemistry Major Curriculum (8-28-13).pdf
65 KB
Polymer Chemistry major

From: David Kuehn <dkuehn@pittstate.edu>    Thu, Aug 15, 2013 08:55 PM
Subject: Polymer Chemistry major
To: Karl Kunkel <kkunkel@pittstate.edu>

Dr. Kunkel,

As per our discussion, I understand that the proposed Polymer Chemistry major will require PHYS 104/130 and PHYS 105/132 as core courses with a possible additional enrollment of ten or more students each time they are offered. This additional enrollment can be accommodated with our current scheduling model. We will be happy to coordinate with the Chemistry Department in optimizing the timing of the course offerings especially with regard to the laboratory sections.

Further, I enthusiastically support the new Polymer Chemistry major. The proposed major has many benefits including an increase in undergraduate research opportunities on campus and the fact that other upper-division courses within the new major will provide cutting-edge elective courses for our physics majors.

David M. Kuehn
University Professor and Interim Chair
Physics Department
Pittsburg State University
(620) 235-4388
Re: New curriculum

From: Tim Flood <tflood@pittstate.edu>  Fri, May 03, 2013 12:40 PM
Subject: Re: New curriculum

To: Ram Gupta <rgupta@pittstate.edu>
Cc: Dixie Smith <dsmith@pittstate.edu>

Ram,

We are usually a little tight on Calc I, but we should be able to squeeze a dozen or so students in. If it becomes more than that, we'll look at adding another section.

Tim

----- Original Message -----  
> From: "Ram Gupta" <rgupta@pittstate.edu> 
> To: "Tim Flood" <tflood@pittstate.edu> 
> Sent: Friday, May 3, 2013 12:08:43 PM 
> Subject: New curriculum

> Dr. Tim Flood, 
>
> We are developing a new curriculum for polymer chemistry. The committee members agree that the students should be required to take 
> MATH 150 (Calculus I) in their curriculum. Although we are not expecting large enrollment (probably less than 12 in the first few years), but I thought to let you know about this new development. Dr. Dixie asked me to check with you about this. Do you have enough room/facility to accommodate new students for polymer chemistry? If you have any concern about this please let me know. 
>
> Thank you so much. 
>
> Ram Gupta 
>
Request for New Course Template
(Undergraduate Course Numbers through Course Number 699)

Department: Chemistry  College: College of Arts and Sciences

Date of Submission to the Department: 08/28/2013

Contact Person: Dr. Dilip Paul  ☑ Faculty member ☐ Chair

Title of Course: Laboratory safety and compliance  Credit Hours: 1

Course Number: CHEM 235  Hegis Number: ___

Date first offered: 2014
(Semester/Year)

To be Offered: ☑ Fall  ☑ Spring  ☐ Summer  Estimated Enrollment: 20
(check all that apply)

Prerequisite(s):

This course is: ☑ Required  ☐ Elective

If this course is “required,” which major(s) will require it? Polymer Chemistry

Course Description: This course is designed to for personnel and students who will be working inside a chemistry laboratory (academic and teaching) on the matters of laboratory safety and compliance. Survey recommended best practices for safe laboratory operation, handling and disposal of hazards materials, pressurized and cryogenic gases. Introduction to first aid operation including the latest federal, state, city and campus regulations to prevent accidents or exposure that may causes injury, property damage, or interference with other works. Students cannot receive credit for both CHEM 235 and CHEM 735.
(as it will appear in the catalog)

Purpose/Justification for Course: Introduction to the basic safety and chemical compliances for students who will be doing labwork in the Department of Chemistry. This course is designed to introduce lower-division students (freshmen and sophomores) to laboratory safety, while CHEM 735 is intended as a lab safety course for graduate students.

Objectives/Student Learning Outcomes:
Train personnel in safety and compliance on laboratory safety and compliance, introduce personnel to current good laboratory practices (GLP’s). Introduce laboratory compliance, efficiency and economics as related to safety when operating in a Chemistry laboratory. Introduce concepts involving personal protective equipment (PPE’s). Introduce government agencies responsible for the regulation of GLP, GMP and PPE’s. Introduce the importance materials safety and data sheets (MSDS’s).

Assessment Strategies (e.g. exams, projects, university rubrics, etc.):
Coursework, Presentation, Attendance

PLEASE ATTACH SYLLABUS
Additional Resources Required (e.g. library or multimedia resources, technology, space, major expense, etc.):

Library

Will any additional student fees be required (e.g. equipment, clothing, travel, licensing, etc.)? □ Yes  □ No

If "yes," please realize that it will need to gain approval of the President's Council.

Rationale: ______
Is this course to be considered for General Education? ☒ Yes ☐ No

If "yes," please indicate the University's General Education Goals met by this course AND the assessment data that will be collected to measure these goals:

Please realize that it will need to gain approval of the General Education Committee.

Will this course be required of any education majors? ☐ Yes ☒ No

If "yes," please realize that it will need to have the approval of the Teacher Education Council.

Will this course be submitted for Departmental Academic Honors? ☐ Yes ☒ No

If "yes," please realize that it will need to have the approval of the Faculty Senate Departmental Academic Honors Committee.

What additional costs will be required for this course (e.g. staffing, equipment, etc.)? None

Will this course impact any other department/college/unit’s curricula or programs? ☐ Yes ☒ No

If "yes," have relevant discussions occurred? ☐ Yes ☐ No

Documentation of these discussions (e.g. copies of e-mails, memos, etc.) is required to be attached.

Originating Department: Please complete this form and upload, with syllabus, to the Zimbra Briefcase, "Undergraduate Curriculum Legislation" (within the appropriate College folder, "Preliminary Legislation"), to allow for review and questions. Any modifications should be saved as "original file name.version2.docx" (e.g. MATH 343.version 2.docx) and uploaded as well.

Please print the final version of this form, apply the appropriate signature, and forward to the Office of the Registrar.
PITTSBURG STATE UNIVERSITY

LEGISLATIVE PROCESS
AUTHORIZATION/NOTIFICATION SIGN-OFF SHEET

Signatures:

☒ Approved: Department Chairperson
Date 9/3/2021
Signature, Department Chairperson

☒ Approved: College Curriculum Committee
Date 9/27/21
Signature, College Curriculum Committee Chair

☒ Approved: Dean of College
Date 9/27/21
Signature, Dean

☐ Approved: General Education Committee (if applicable)
Date ______ Signature, General Education Committee Chair

☐ Approved: Teacher Education Council (if applicable)
Date ______ Signature, Teacher Education Council Chair

☐ Approved: Faculty Senate University Undergraduate Curriculum Committee
Date 9/27/21
Signature, Undergraduate Curriculum Committee Chair

☐ Approved: Faculty Senate
Date ______ Signature, Recording Secretary, Faculty Senate

Please Note
This is a two-to-three-month process, at least, and is designed to eliminate questions and concerns at the beginning of the process. Any questions/concerns not addressed prior to the review by the College Curriculum Committee and the Faculty Senate Undergraduate Curriculum Committee may result in an additional month added to the process.
Attach syllabus here:
Please see attached file.
COURSE DESCRIPTION

CHEM 235: Laboratory safety and compliance (1 hr)

This course is designed for personnel and students who will be working inside a chemistry laboratory (academic and teaching) on the matters of laboratory safety and compliance. Survey/recommended best practices for safe laboratory operation, handling and disposal of hazards materials, pressurized and cryogenic gases. Introduction to first aid operations including the latest Federal, State, City and Campus regulation to prevent accidents or exposure that may cause injury, property damage or interference with other works.

Prerequisite/corequisite: Permission of instructor

Purpose/justification for course: Introduction to the basic safety and chemical compliances.

Objectives/Student Learning Outcomes:
- Train personnel in safety and compliance on laboratory safety and compliance.
- Introduce personnel to current good laboratory practices (GLP’s).
- Introduce laboratory compliance, efficiency and economics as related to safety when operating in a Chemistry laboratory.
- Introduce concepts involving personal protective equipment (PPE’s).
- Introduce government agencies responsible for the regulation of GLP, GMP and PPE’s.
- Introduce the importance materials safety and data sheets (MSDS’s).

Assessment Strategies: Coursework, Presentation, Attendance
Course Syllabus

CHEM 235: Laboratory safety and compliance

Instructor: CHEM Faculty
Email: TBD
Phone No.: TBD

Office: TBD
Lecture room: TBD
Office Hours: TBD

I. Descriptive Information

A. Course Number: CHEM 235

B. Course Title and Credits: Laboratory safety and compliance (1 credit)

C. Description of the Course: This course is designed for personnel and students who will be working inside a chemistry laboratory (academic and teaching) on the matters of laboratory safety and compliance. Survey/recommended best practices for safe laboratory operation, handling and disposal of hazards materials, pressurized and cryogenic gases. Introduction to first aid operation including the latest Federal, State, City and Campus regulation to prevent accidents or exposure that may causes injury, property damage or interference with other works.

D. Scope:

- Compliance, Efficiency and Economics.
- Emergency Services and Procedures
- Laboratory Policies
- Personal Protective Equipment
- Fire – types, hazards, procedures,
- Agency for Toxic Substances and Disease Registry (DHHS)
- Chemical Hygiene and Laboratories (CHL)
- Environmental Protection Agency (EPA)
- Kansas Department of Health and Environment (KDHE)
- Occupational Safety and Health Administration (OSHA) Regulations

E. Prerequisites: Permission of instructor

II. Course Objectives

The Course is designed to:

- Train personnel in safety and compliance on laboratory safety and compliance.
- Introduce personnel to current good laboratory practices (GLP’s).
- Introduce laboratory compliance, efficiency and economics as related to safety when operating in a Chemistry laboratory.
III. Course Requirements

A. Participation in the course work:

Regular participation is very important for the successful completion of the course work. It is your responsibility to attend classes regularly and keep up to date with the lecture material so that you do not fall behind. The understanding of the course material will depend heavily upon an understanding of preceding material. Also please keep in mind that mere memorization of the facts without understanding the subject matter is almost certain to result in a poor performance in the course. The goal of each quiz will be to evaluate understanding of the course material as opposed to mere memorization. This means that you will ultimately be expected to utilize the basic principles taught in this course in the solution of new problem situations.

There will be no "extra credit" work in this course.

IV. Grades:

<table>
<thead>
<tr>
<th>Coursework - Paper</th>
<th>20 pts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presentation</td>
<td>20 pts</td>
</tr>
<tr>
<td>Attendance</td>
<td>10 pts</td>
</tr>
<tr>
<td>Maximum Total at end of semester</td>
<td>50 pts</td>
</tr>
</tbody>
</table>

Final letter grades (before attendance is considered, after dropped lab and quiz) will be based on the following grading scale:

A > 80 %
B > 70 %
C > 60 %
D > 40 %
F < 40 %

V. Calendar

**Tentative Quiz Topics and Dates**

Quiz 1: TBA
Quiz 2: TBA
Quiz 3: TBA
Quiz 4: TBA

VI. Academic Misconduct

You will be allowed to use a non-programmable calculator during the quizzes and examinations in this course. No other help is allowed. Use of other materials, information or persons during a quiz or exam will be viewed as cheating. In other words, collaborative efforts to answer quiz or exam questions are strictly forbidden, and your answers to quiz or exam questions must be the result of strictly individual efforts. Evidence of cheating as defined above will result in a grade of zero for that quiz or exam for the first offense, even if the cheating activity involves only one question. In the second instance of such activity, the instructor will proceed with formal charges against the student, to effect, at least a failing grade in the course. Please consult the policy on Student Academic Dishonesty on in the University Catalog (2013-2014).

VII. Disclaimer: Instructor reserves the right to revise the content of the syllabus as needed throughout the semester for better learning experience of the students.
Request for New Course Template
(Undergraduate Course Numbers through Course Number 699)

Department: Chemistry        College: College of Arts and Sciences
Date of Submission to the Department: 08/12/2013
Contact Person: Dr. Dilip Paul        □ Faculty member  □ Chair

Title of Course: Sophomore research in polymer chemistry       Credit Hours: 1

Course Number: CHEM 270       Hegis Number: ____

Date first offered: 2014
(Semester/Year)

To be Offered: □ Fall  □ Spring  □ Summer          Estimated Enrollment: 0-20
(check all that apply)

Prerequisite(s): CHEM 215 or permission of instructor

This course is: □ Required  □ Elective
   If this course is “required,” which major(s) will require it? Polymer Chemistry

Course Description: Introduction to polymer chemistry research in laboratory environment, synthesis of basic polymers. Polymer research problems
(as it will appear in the catalog)

Purpose/Justification for Course: Fundamentals of basic research in polymer science

Objectives/Student Learning Outcomes:
Students will have basic hands-on experience in polymer synthesis

Assessment Strategies (e.g. exams, projects, university rubrics, etc.):
Writing everyday lab reports, data analysis, interpretation of results, lab tests, and presentations

PLEASE ATTACH SYLLABUS

Additional Resources Required (e.g. library or multimedia resources, technology, space, major expense, etc.):
Library

Will any additional student fees be required (e.g. equipment, clothing, travel, licensing, etc.)? □ Yes  □ No
   If “yes,” please realize that it will need to gain approval of the President’s Council.

Rationale: _____
Is this course to be considered for General Education? □ Yes ☒ No

If “yes,” please indicate the University’s General Education Goals met by this course AND the assessment data that will be collected to measure these goals:

Please realize that it will need to gain approval of the General Education Committee.

Will this course be required of any education majors? □ Yes ☒ No

If “yes,” please realize that it will need to have the approval of the Teacher Education Council.

Will this course be submitted for Departmental Academic Honors? □ Yes ☒ No

If “yes,” please realize that it will need to have the approval of the Faculty Senate Departmental Academic Honors Committee.

What additional costs will be required for this course (e.g. staffing, equipment, etc.)? Costs are covered by the polymer initiative

Will this course impact any other department/college/unit’s curricula or programs? □ Yes ☒ No

If “yes,” have relevant discussions occurred? □ Yes ☐ No

Documentation of these discussions (e.g. copies of e-mails, memos, etc.) is required to be attached.

Originating Department: Please complete this form and upload, with syllabus, to the Zimbra Briefcase, “Undergraduate Curriculum Legislation” (within the appropriate College folder, “Preliminary Legislation”), to allow for review and questions. Any modifications should be saved as “original file name.version2.docx” (e.g. MATH 343.version 2.docx) and uploaded as well.

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PITTSBURG STATE UNIVERSITY

LEGISLATIVE PROCESS
AUTHORIZATION/NOTIFICATION SIGN-OFF SHEET

Signatures:

☒ Approved: Department Chairperson
  Date 1/3/2013 Signature, Department Chairperson
  [Signature]

☒ Approved: College Curriculum Committee
  Date 10/7/13 Signature, College Curriculum Committee Chair
  [Signature]

☒ Approved: Dean of College
  Date 9/3/13 Signature, Dean
  [Signature]

☐ Approved: General Education Committee (if applicable)
  Date ______ Signature, General Education Committee Chair

☐ Approved: Teacher Education Council (if applicable)
  Date ______ Signature, Teacher Education Council Chair

☐ Approved: Faculty Senate University Undergraduate Curriculum Committee
  Date 11/8/13 Signature, Undergraduate Curriculum Committee Chair
  [Signature]

☐ Approved: Faculty Senate
  Date ______ Signature, Recording Secretary, Faculty Senate

Please Note
This is a two-to-three-month process, at least, and is designed to eliminate questions and concerns at the beginning of the process. Any questions/concerns not addressed prior to the review by the College Curriculum Committee and the Faculty Senate Undergraduate Curriculum Committee may result in an additional month added to the process.
Attach syllabus here:
Please see attached file.
COURSE DESCRIPTION

CHEM 270: Sophomore research in polymer chemistry (1 hr)

Introduction to polymer chemistry research in laboratory environment, synthesis of basic polymers. Polymer research problems.

Prerequisite/corequisite: CHEM 215 or permission of instructor

Purpose/Justification for course: Fundamentals of basic research in polymer science.

Objectives/Student Learning Outcomes: Students will have basic hands-on experience in polymer synthesis.

Assessment Strategies: Writing everyday lab reports, data analysis, interpretation of results, lab tests, and presentations.
Course Syllabus

CHEM 270: Sophomore research in polymer chemistry

Instructor: CHEM/PET Faculty
Email: TBD
Phone No.: TBD

Office: TBD
Lecture room: TBD
Office Hours: TBD

I. Descriptive Information

A. Course Number: CHEM 270

B. Course Title and Credits: Sophomore research in polymer chemistry (1 credit)

C. Description of the Course: Introduction to polymer chemistry research in laboratory environment, synthesis of basic polymers. Polymer research problems

1. Introduction to the safety measures in the polymer chemistry laboratory
2. Maintenance of laboratory environment and integrity
3. Basic training towards chemicals, glass wares, and equipment
4. Introduction to basic polymer synthesis
5. Basic techniques of polymer purifications and characterizations
6. Writing laboratory reports
7. Presentations of the research outcome

D. Required Text:

1. Laboratory Safety for Chemistry Students, by Robert H. Hill and David Finster, Wiley

Note: Instructor reserves the right to change the required text books for better learning experience of the students.

E. Prerequisites: CHEM 215 or permission of instructor
II. Laboratory Course Objectives

The laboratory course is designed to:

1. Introduce the knowledge of chemical laboratory safety
2. Learn how to handle glasswares, chemicals, and equipment
3. Introduce basic concepts of polymer synthesis in laboratory
4. Introduce the basic techniques of polymer purification
5. Get experience about the techniques used for polymer characterizations
6. Develop skills in critical thinking through designing new polymers
7. Develop skills of analyzing data
8. Maintain laboratory notebook

III. Course Requirements

A. Participation in the laboratory:

Regular participation is very important for the successful completion of the research work. It is your responsibility to attend laboratory regularly and keep up to date with the experimental techniques in laboratory notebook so that you do not fall behind. As is true with most sciences, polymer chemistry is a structured subject. This means that an understanding of the laboratory protocols will depend heavily upon an understanding of laboratory techniques involved in research. Also please keep in mind that mere memorization of the facts without understanding the subject matter is almost certain to result in a poor performance in this laboratory course. In fact, the goal of each experiment and presentation will evaluate your understanding of the course material as opposed to mere memorization. This means that you will ultimately be expected to utilize the basic principles learnt in this course.

There will be no “extra credit” work in this course.

B. Homework:

A series of literature will be given during the courses. You will be responsible learn experimental techniques effectively. This helps you to understand critically how to perform laboratory experiments and finish your projects on time. You should therefore view learning how to perform these daily experimental exercises as a high priority.
IV. Evaluation of Performance

Your grade in this course will be determined by a series of laboratory tests, successes on research projects, analytical and data interpretation skills and final presentation of the research work. No makeup evaluation will be given unless prior permission was taken for absences. The division of the percentage grade is given below:

Lab report writing: 20 points
Experimental skills: 15 points
Regular Participation: 15 points
Home work: 10 points
Final lab test: 25 points
Final Presentation: 15 points

Total = 100 points

Your overall letter grade for the course will be determined using the following scale:

<table>
<thead>
<tr>
<th>Total Score</th>
<th>Letter Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 85%</td>
<td>A</td>
</tr>
<tr>
<td>&gt;70%</td>
<td>B</td>
</tr>
<tr>
<td>&gt;55%</td>
<td>C</td>
</tr>
<tr>
<td>&gt;40%</td>
<td>D</td>
</tr>
<tr>
<td>&lt;40%</td>
<td>F</td>
</tr>
</tbody>
</table>

V. Texts

1. Laboratory Safety for Chemistry Students, by Robert H. Hill and David Finster, Wiley

Note: Instructor reserves the right to change the required text books for better learning experience of the students.

Recommended: Calculator with scientific notation.
VI. Calendar

**Tentative Dates for homework and lab reports**

1: TBA
2: TBA
3: TBA
4: TBA

**Tentative Dates for lab test**

Test 1: TBA
Test 2: TBA
Test 3: TBA
Test 4: TBA

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**Comprehensive final presentation/lab test:** According to University Final Exam Schedule. **PLEASE Don’t make any travel plans that conflicts with your Exam Schedule.**

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Please note that the examination topics to be covered are approximate only. The materials covered in each examination will be announced in the lecture class.

The purpose of each examination is to evaluate the understanding of the course material, as opposed to mere memorization. This means that the student will ultimately be expected to utilize basic principles in the solution of new problem situations.

VII. Academic Misconduct

You will be allowed to use a non-programmable calculator during the quizzes and examinations in this course. No other help is allowed. Use of other materials, information or persons during a quiz or exam will be viewed as cheating. In other words, collaborative efforts to answer quiz or exam questions are strictly forbidden, and your answers to quiz or exam questions must be the result of strictly individual efforts. Evidence of cheating as defined above will result in a grade of zero for that quiz or exam for the first offense, even if the cheating activity involves only one question. In the second instance of such activity, the instructor will proceed with formal charges against the student, to effect, at least a failing grade in the course.
Please consult the policy on Student Academic Dishonesty on in the University Catalog (2013-2014).

**VIII. Disclaimer:** Instructor reserves the right to revise the content of the syllabus as needed throughout the semester for better learning experience of the students.
Request for New Course Template
(Undergraduate Course Numbers through Course Number 699)

Department: Chemistry    College: College of Arts and Sciences

Date of Submission to the Department: 08/12/2013

Contact Person: Dr. Dilip Paul    ☐ Faculty member    ☑ Chair

Title of Course: Introduction to polymer science and technology
Credit Hours: 3

Course Number: CHEM 360
Hegis Number: _____

Date first offered: 2014
(Semester/Year)

To be Offered: ☑ Fall ☑ Spring ☑ Summer
(check all that apply)

Estimated Enrollment: 20

Prerequisite(s): CHEM 215 or permission of instructor

This course is: ☐ Required    ☑ Elective

If this course is "required," which major(s) will require it? Polymer Chemistry

Course Description: Definitions and fundamentals of polymer science, understanding the structural aspects of various types of polymers, prepolymer and designer monomers, introduction to polymer science, basic principles of polymer chemistry and applications
(as it will appear in the catalog)

Purpose/Justification for Course: Introduction to the basic chemistry of polymer science and their applications in daily life

Objectives/Student Learning Outcomes:
Students will have basic knowledge of chemistry behind the polymer science and their applications in academic and industrial sectors

Assessment Strategies (e.g. exams, projects, university rubrics, etc.):
Quizzes, written tests, and final examinations

PLEASE ATTACH SYLLABUS

Additional Resources Required (e.g. library or multimedia resources, technology, space, major expense, etc.):
Library

Will any additional student fees be required (e.g. equipment, clothing, travel, licensing, etc.)? ☐ Yes    ☑ No

If "yes," please realize that it will need to gain approval of the President’s Council.
Is this course to be considered for General Education? □ Yes ☒ No

If “yes,” please indicate the University’s General Education Goals met by this course AND the assessment data that will be collected to measure these goals:

Please realize that it will need to gain approval of the General Education Committee.

Will this course be required of any education majors? □ Yes ☒ No

If “yes,” please realize that it will need to have the approval of the Teacher Education Council.

Will this course be submitted for Departmental Academic Honors? □ Yes ☒ No

If “yes,” please realize that it will need to have the approval of the Faculty Senate Departmental Academic Honors Committee.

What additional costs will be required for this course (e.g. staffing, equipment, etc.)? Costs are covered by the polymer initiative

Will this course impact any other department/college/unit’s curricula or programs? □ Yes ☒ No

If “yes,” have relevant discussions occurred? □ Yes ☒ No

Documentation of these discussions (e.g. copies of e-mails, memos, etc.) is required to be attached.

Originating Department: Please complete this form and upload, with syllabus, to the Zimbra Briefcase, “Undergraduate Curriculum Legislation” (within the appropriate College folder, “Preliminary Legislation”), to allow for review and questions. Any modifications should be saved as “original file name.version2.docx” (e.g. MATH 343.version 2.docx) and uploaded as well.

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Signatures:

☐ Approved: Department Chairperson
   Date 9/13/2013 Signature, Department Chairperson
   
   ☑ Approved: College Curriculum Committee
   Date 10/7/13 Signature, College Curriculum Committee Chair
   
   ☑ Approved: Dean of College
   Date 11/13/13 Signature, Dean
   
   ☐ Approved: General Education Committee (if applicable)
   Date _______ Signature, General Education Committee Chair

☐ Approved: Teacher Education Council (if applicable)
   Date _______ Signature, Teacher Education Council Chair

☐ Approved: Faculty Senate University Undergraduate Curriculum Committee
   Date 11/11/13 Signature, Undergraduate Curriculum Committee Chair

☐ Approved: Faculty Senate
   Date _______ Signature, Recording Secretary, Faculty Senate

Please Note

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Attach syllabus here:
Please see attached file.
COURSE DESCRIPTION

CHEM 360: Introduction to polymer science and technology (3 hrs)

Definitions and fundamentals of polymer science, understanding the structural aspects of various types of polymers, prepolymers and designer monomers, introduction to polymer science, basic principles of polymer chemistry and applications

Prerequisite/corequisite: CHEM 215 or permission of instructor

Purpose/justification for course: Introduction to the basic chemistry of polymer science and their applications in daily life.

Objectives/Student Learning Outcomes: Students will have basic knowledge of chemistry behind the polymer science and their applications in academic and industrial sectors.

Assessment Strategies: Quizzes, written tests, and final examinations
Course Syllabus

CHEM 360: Introduction to polymer science and technology

Instructor: CHEM/PET Faculty
Email: TBD
Phone No.: TBD

Office: TBD
Lecture room: TBD
Office Hours: TBD

I. Descriptive Information

A. Course Number: CHEM 360

B. Course Title and Credits: Introduction to polymer science and technology (3 credits)

C. Description of the Course: Definitions and fundamentals of polymer science, understanding the structural aspects of various types of polymers, prepolymers and designer monomers, introduction to polymer science, basic principles of polymer chemistry and applications

1. Introduction and historical developments of polymers
2. Why study polymers
3. Monomers, prepolymers and polymers
4. Classifications and nomenclature of polymers
5. Polymer compositions and structures
6. Molecular weight determination
7. Environmental assessment of polymers
8. Polymers in today’s marketplace

D. Required Text:

1. Polymer Chemistry- An introduction, by Malcolm P. Stevens, Oxford University Press, (3rd Ed);
Note: Instructor reserves the right to change the required text books for better learning experience of the students.

E. Prerequisites: CHEM 215 or permission of instructor

II. Course Objectives

The Course is designed to:

1. introduce basic concepts of polymer chemistry to the students who expect to have polymer chemistry, plastic technology, chemistry, and biology as their majors and/or minors
2. introduce students to the different kinds of polymers and their properties
3. introduce the basic principles of polymer synthesis and characterizations
4. expose students to the world of polymers and their applications in daily life, and
5. develop skills in critical thinking through solving polymer chemistry problems.

III. Course Requirements

A. Participation in the course work:

Regular participation is very important for the successful completion of the course work. It is your responsibility to attend classes regularly and keep up to date with the lecture material so that you do not fall behind. As is true with most sciences, polymer chemistry is a structured subject. This means that an understanding of the course material will depend heavily upon an understanding of preceding material. Also please keep in mind that mere memorization of the facts without understanding the subject matter is almost certain to result in a poor performance in the course. In fact, the goal of each quiz and exam will be to evaluate understanding of the course material as opposed to mere memorization. This means that you will ultimately be expected to utilize the basic principles taught in this course in the solution of new problem situations.

There will be no “extra credit” work in this course.
B. Homework:

A series of exercises are given at the end of each chapter in your text. You will be responsible for learning to solve these problems. This helps you to understand critically the subject matter of the chapter. On the other hand, the quizzes, tests, and even final examinations will resemble these one or more of the exercises that are assigned below. You should therefore view learning how to do these exercises as a **high priority**. Learning how to do these exercises at the end of each chapter that have not been assigned should also prove helpful.

IV. Evaluation of Performance

Your grade in this course will be determined by a series tests, a series of quizzes, and a comprehensive final examination. Each test will be weighted at 15% of your grade. The final exam will be comprehensive in nature, will be worth 15% of your grade.

The quizzes will be given during the class period (either at the beginning or at the end) and will cover exercises from the text that were assigned as homework and topics covered in the class. **No makeup examinations or quizzes will be given** unless prior permission was taken for absences.

Four tests: 60 points
Four quizzes: 10 points
Homework: 10 points
Comprehensive Final: 15 points
Regular Participation: 5 points

**Total = 100 points**

Your overall letter grade for the course will be determined using the following scale:

<table>
<thead>
<tr>
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V. Texts

1. Polymer Chemistry- An introduction, by Malcolm P. Stevens, Oxford University Press, (3rd Ed);
   Note: Instructor reserves the right to change the required text books for better learning experience of the students.

Recommended: Calculator with scientific notation.

VI. Calendar

Tentative Quiz Topics and Dates

Quiz 1: TBA
Quiz 2: TBA
Quiz 3: TBA
Quiz 4: TBA

Tentative Examination Topics and Dates

Exam 1: TBA
Exam 2: TBA
Exam 3: TBA
Exam 4: TBA

Comprehensive Final Examination: According to University Final Exam Schedule. PLEASE Don’t make any travel plans that conflicts with your Exam Schedule.

Please note that the examination topics to be covered are approximate only. The materials covered in each examination will be announced in the lecture class.

The purpose of each exam. is to evaluate the understanding of the course material, as opposed to mere memorization. This means that the student will ultimately be expected to utilize basic principles in the solution of new problem situations.
VII. Academic Misconduct

You will be allowed to use a non-programmable calculator during the quizzes and examinations in this course. No other help is allowed. Use of other materials, information or persons during a quiz or exam will be viewed as cheating. In other words, collaborative efforts to answer quiz or exam questions are strictly forbidden, and your answers to quiz or exam questions must be the result of strictly individual efforts. Evidence of cheating as defined above will result in a grade of zero for that quiz or exam for the first offense, even if the cheating activity involves only one question. In the second instance of such activity, the instructor will proceed with formal charges against the student, to effect, at least a failing grade in the course. Please consult the policy on Student Academic Dishonesty on in the University Catalog (2013-2014).

VIII. Disclaimer: Instructor reserves the right to revise the content of the syllabus as needed throughout the semester for better learning experience of the students.
Request for New Course Template
(Undergraduate Course Numbers through Course Number 699)

Department: Chemistry  College: College of Arts and Sciences

Date of Submission to the Department: 08/12/2013

Contact Person: Dr. Dilip Paul  □ Faculty member  □ Chair

Title of Course: Junior research in polymer chemistry  Credit Hours: 1

Course Number: CHEM 370  Hegis Number: ___

Date first offered: 2014
(Semester/Year)

To be Offered: ☑ Fall  ☑ Spring  ☑ Summer  Estimated Enrollment: 20
(check all that apply)

Prerequisite(s): CHEM 215 or CHEM 360 or permission of instructor

This course is: □ Required  ☑ Elective

If this course is “required,” which major(s) will require it? Polymer Chemistry

Course Description: Synthesis of commercially important polymers, polymeric materials, composites and smart polymers and their characterization techniques. Polymer research problems.
(as it will appear in the catalog)

Purpose/Justification for Course: Fundamentals of polymer research to build advanced research experience in polymer science and technology

Objectives/Student Learning Outcomes:
Students will have advanced hands-on experience in polymer synthesis and characterization.

Assessment Strategies (e.g. exams, projects, university rubrics, etc.):
Writing everyday lab reports, data analysis, interpretation of results, lab tests, and presentations

PLEASE ATTACH SYLLABUS

Additional Resources Required (e.g. library or multimedia resources, technology, space, major expense, etc.):
Library

Will any additional student fees be required (e.g. equipment, clothing, travel, licensing, etc.)? □ Yes  ☑ No

If “yes,” please realize that it will need to gain approval of the President’s Council.

Rationale: _____
Is this course to be considered for General Education?  □ Yes  ❌ No

If “yes,” please indicate the University’s General Education Goals met by this course AND the assessment data that will be collected to measure these goals:

Please realize that it will need to gain approval of the General Education Committee.

Will this course be required of any education majors?  □ Yes  ❌ No

If “yes,” please realize that it will need to have the approval of the Teacher Education Council.

Will this course be submitted for Departmental Academic Honors?  □ Yes  ❌ No

If “yes,” please realize that it will need to have the approval of the Faculty Senate Departmental Academic Honors Committee.

What additional costs will be required for this course (e.g. staffing, equipment, etc.)? **Costs are covered by the polymer initiative**

Will this course impact any other department/college/unit’s curricula or programs?  □ Yes  ❌ No

If “yes,” have relevant discussions occurred?  □ Yes  □ No

Documentation of these discussions (e.g. copies of e-mails, memos, etc.) is required to be attached.

Originating Department: Please complete this form and upload, with syllabus, to the Zimbra Briefcase, “Undergraduate Curriculum Legislation” (within the appropriate College folder, “Preliminary Legislation”), to allow for review and questions. Any modifications should be saved as “original file name.version2.docx” (e.g. MATH 343.version 2.docx) and uploaded as well.

Please print the final version of this form, apply the appropriate signature, and forward to the Office of the Registrar.
PITTSBURG STATE UNIVERSITY

LEGISLATIVE PROCESS
AUTHORIZATION/NOTIFICATION SIGN-OFF SHEET

Signatures:

☑ Approved: Department Chairperson
  Date 12/2/2017 Signature, Department Chairperson

☑ Approved: College Curriculum Committee
  Date 1/17/18 Signature, College Curriculum Committee Chair

☑ Approved: Dean of College
  Date 2/23/18 Signature, Dean

☐ Approved: General Education Committee (if applicable)
  Date ______ Signature, General Education Committee Chair

☐ Approved: Teacher Education Council (if applicable)
  Date ______ Signature, Teacher Education Council Chair

☐ Approved: Faculty Senate University Undergraduate Curriculum Committee
  Date 11/12/13 Signature, Undergraduate Curriculum Committee Chair

☐ Approved: Faculty Senate
  Date ______ Signature, Recording Secretary, Faculty Senate

Please Note
This is a two-to-three-month process, at least, and is designed to eliminate questions and concerns at the beginning of the process. Any questions/concerns not addressed prior to the review by the College Curriculum Committee and the Faculty Senate Undergraduate Curriculum Committee may result in an additional month added to the process.
Attach syllabus here:
Please see attached file.
COURSE DESCRIPTION

CHEM 370: Junior research in polymer chemistry (1 hr)

Synthesis of commercially important polymers, polymeric materials, composites and smart polymers and their characterization techniques. Polymer research problems.

Prerequisite/corequisite: CHEM 215 or CHEM 360 or permission of instructor

Purpose/justification for course: Fundamentals of polymer research to build advanced research experience in polymer science and technology

Objectives/Student Learning Outcomes: Students will have advanced hands-on experience in polymer synthesis and characterization.

Assessment Strategies: Writing everyday lab reports, data analysis, interpretation of results, lab tests, and presentations.
Course Syllabus

CHEM 370: Junior research in polymer chemistry

Instructor: CHEM/PET Faculty
Email: TBD
Phone No.: TBD

Office: TBD
Lecture room: TBD
Office Hours: TBD

I. Descriptive Information

A. Course Number: CHEM 370

B. Course Title and Credits: Junior research in polymer chemistry (1 credit)

C. Description of the Course: Synthesis of commercially important polymers, polymeric materials, composites and smart polymers and their characterization techniques.

1. Important safety measures in the polymer chemistry laboratory
2. Maintenance of laboratory environment and integrity
3. Advanced training and handling of chemicals, glasswears, and equipment
4. Advanced synthesis of designer polymers
5. Advanced techniques of polymer purifications and characterizations
6. Writing laboratory reports
7. Presentations of the research outcome
8. Polymer research problems.

D. Required Text:

1. Laboratory Safety for Chemistry Students, by Robert H. Hill and David Finster, Wiley

Note: Instructor reserves the right to change the required text books for better learning experience of the students.

E. Prerequisites: CHEM 215 or CHEM 360 or permission of instructor
II. Laboratory Course Objectives

The laboratory course is designed to:

1. Updating the knowledge of chemical laboratory safety
2. Learn how to handle glasswares, chemicals, and equipment
3. Introduce advanced concepts of polymer synthesis
4. Introduction of advanced characterization techniques
5. Get experience in designing novel polymers for advanced application
6. Develop skills in critical thinking through designing new polymers
7. Develop advanced skills of analyzing data
8. Maintain laboratory notebook

III. Course Requirements

A. Participation in the laboratory:

Regular participation is very important for the successful completion of the research work. It is your responsibility to attend laboratory regularly and keep up to date with the experimental techniques in laboratory notebook so that you do not fall behind. As is true with most sciences, polymer chemistry is a structured subject. This means that an understanding of the laboratory protocols will depend heavily upon an understanding of laboratory techniques involved in research. Also please keep in mind that mere memorization of the facts without understanding the subject matter is almost certain to result in a poor performance in this laboratory course. In fact, the goal of each experiment and presentation will evaluate your understanding of the course material as opposed to mere memorization. This means that you will ultimately be expected to utilize the basic principles learnt in this course.

There will be no “extra credit” work in this course.

B. Homework:

A series of literature will be given during the courses. You will be responsible learn experimental techniques effectively. This helps you to understand critically how to perform laboratory experiments and finish your projects on time. You should therefore view learning how to perform these daily experimental exercises as a high priority.
IV. Evaluation of Performance

Your grade in this course will be determined by a series of laboratory tests, successes on research projects, analytical and data interpretation skills and final presentation of the research work. No makeup evaluation will be given unless prior permission was taken for absences. The division of the percentage grade is given below:

- Lab report writing: 20 points
- Experimental skills: 15 points
- Regular Participation: 15 points
- Home work: 10 points
- Final lab test: 25 points
- Final Presentation: 15 points

**Total = 100 points**

Your overall letter grade for the course will be determined using the following scale:

<table>
<thead>
<tr>
<th>Total Score</th>
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<tbody>
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<td>D</td>
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<tr>
<td>&lt;40%</td>
<td>F</td>
</tr>
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V. Texts

1. Laboratory Safety for Chemistry Students, by Robert H. Hill and David Finster, Wiley

**Note:** Instructor reserves the right to change the required text books for better learning experience of the students.

Recommended: Calculator with scientific notation.
VI. Calendar

**Tentative Dates for homework and lab reports**

1: TBA
2: TBA
3: TBA
4: TBA

**Tentative Dates for lab test**

Test 1: TBA
Test 2: TBA
Test 3: TBA
Test 4: TBA

---

**Comprehensive final presentation:** According to University Final Exam Schedule. **PLEASE**
Don't make any travel plans that conflicts with your Exam Schedule.

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*Please note that the examination topics to be covered are approximate only. The
materials covered in each examination will be announced in the lecture class.*

The purpose of each examination is to evaluate the understanding of the course material,
as opposed to mere memorization. This means that the student will ultimately be expected to
utilize basic principles in the solution of new problem situations.

---

**VII. Academic Misconduct**

You will be allowed to use a non-programmable calculator during the quizzes and
examinations in this course. No other help is allowed. Use of other materials, information or
persons during a quiz or exam will be viewed as cheating. In other words, collaborative efforts
to answer quiz or exam questions are strictly forbidden, and your answers to quiz or exam
questions must be the result of strictly individual efforts. Evidence of cheating as defined above
will result in a grade of zero for that quiz or exam for the first offense, even if the cheating
activity involves only one question. In the second instance of such activity, the instructor will
proceed with formal charges against the student, to effect, at least a failing grade in the course.
**Please consult the policy on Student Academic Dishonesty on in the University Catalog (2013-2014).**
VIII. Disclaimer: Instructor reserves the right to revise the content of the syllabus as needed throughout the semester for better learning experience of the students.
Request for New Course Template
(Undergraduate Course Numbers through Course Number 699)

Department: Chemistry    College: College of Arts and Sciences

Date of Submission to the Department: 08/12/2013

Contact Person: Dr. Dilip Paul    □ Faculty member    □ Chair

Title of Course: Polymer synthesis and characterizations    Credit Hours: 3

Course Number: CHEM 625    Hegis Number: ____

Date first offered: 2014
(Semester/Year)

To be Offered: □ Fall    □ Spring    □ Summer    Estimated Enrollment: 20
(check all that apply)

Prerequisite(s): CHEM 360 or permission of instructor

This course is: □ Required    □ Elective

If this course is “required,” which major(s) will require it? Polymer Chemistry

Course Description: Introduction to the concepts of polymer chemistry and synthesis, classical, advanced and other approaches of polymer synthesis, structure-property correlation, various methods of polymer characterization
(as it will appear in the catalog)

Purpose/Justification for Course: Concepts of polymers synthesis including free radicals and step growth approaches, various techniques of polymer purification and their characterization

Objectives/Student Learning Outcomes:
Acquiring knowledge of state-of-art approaches of polymer synthesis and their characterization methods

Assessment Strategies (e.g. exams, projects, university rubrics, etc.):
Quizzes, written tests, and final examinations

PLEASE ATTACH SYLLABUS

Additional Resources Required (e.g. library or multimedia resources, technology, space, major expense, etc.):
Library

Will any additional student fees be required (e.g. equipment, clothing, travel, licensing, etc.)? □ Yes    □ No

If “yes,” please realize that it will need to gain approval of the President’s Council.

Rationale: _____
Is this course to be considered for General Education?  □ Yes  ✕ No

If “yes,” please indicate the University’s General Education Goals met by this course AND the assessment data that will be collected to measure these goals:

Please realize that it will need to gain approval of the General Education Committee.

Will this course be required of any education majors?  □ Yes  ✕ No

If “yes,” please realize that it will need to have the approval of the Teacher Education Council.

Will this course be submitted for Departmental Academic Honors?  □ Yes  ✕ No

If “yes,” please realize that it will need to have the approval of the Faculty Senate Departmental Academic Honors Committee.

What additional costs will be required for this course (e.g. staffing, equipment, etc.)?  Costs are covered by the polymer initiative

Will this course impact any other department/college/unit’s curricula or programs?  □ Yes  ✕ No

If “yes,” have relevant discussions occurred?  □ Yes  □ No

Documentation of these discussions (e.g. copies of e-mails, memos, etc.) is required to be attached.

Originating Department: Please complete this form and upload, with syllabus, to the Zimbra Briefcase, “Undergraduate Curriculum Legislation” (within the appropriate College folder, “Preliminary Legislation”), to allow for review and questions. Any modifications should be saved as “original file name.version2.docx” (e.g. MATH 343.version 2.docx) and uploaded as well.

Please print the final version of this form, apply the appropriate signature, and forward to the Office of the Registrar.
PITTSBURG STATE UNIVERSITY

LEGISLATIVE PROCESS
AUTHORIZATION/NOTIFICATION SIGN-OFF SHEET

Signatures:

☑ Approved: Department Chairperson
  Date: 9/3/2012  Signature, Department Chairperson
  
☐ Approved: College Curriculum Committee
  Date: 9/7/13  Signature, College Curriculum Committee Chair
  
☐ Approved: Dean of College
  Date: 9/4/13  Signature, Dean
  
☐ Approved: General Education Committee (if applicable)
  Date: 11/14/13  Signature, General Education Committee Chair
  
☐ Approved: Teacher Education Council (if applicable)
  Date: 11/14/13  Signature, Teacher Education Council Chair
  
☐ Approved: Faculty Senate University Undergraduate Curriculum Committee
  Date: 11/13  Signature, Undergraduate Curriculum Committee Chair
  
☐ Approved: Faculty Senate
  Date: 11/13  Signature, Recording Secretary, Faculty Senate

Please Note
This is a two-to-three-month process, at least, and is designed to eliminate questions and concerns at the beginning of the process. Any questions/concerns not addressed prior to the review by the College Curriculum Committee and the Faculty Senate Undergraduate Curriculum Committee may result in an additional month added to the process.
Attach syllabus here:
Please see attached file.
COURSE DESCRIPTION

CHEM 625: Polymer synthesis and characterization (3 hrs)

Introduction to the concepts of polymer chemistry and synthesis, classical, advanced and other approaches of polymer synthesis, structure-property correlation, various methods of polymer characterization

Prerequisite/corequisite: CHEM 360 or permission of instructor

Purpose/justification for course: Concepts of polymer synthesis including free radicals and step growth approaches, various techniques of polymer purification and their characterization

Objectives/Student Learning Outcomes: Acquiring knowledge of state-of-art approaches of polymer synthesis and their characterization methods

Assessment Strategies: Quizzes, written tests, and final examination
Course Syllabus

CHEM 625: Polymer synthesis and characterization

Instructor: CHEM/PET Faculty
Email: TBD
Phone No.: TBD

Office: TBD
Lecture room: TBD
Office Hours: TBD

I. Descriptive Information

A. Course Number: CHEM 625

B. Course Title and Credits: Polymer synthesis and characterization (3 credits)

C. Description of the Course: Introduction to the concepts of polymer chemistry and synthesis, classical, advanced and other approaches of polymer synthesis, structure-property correlation, various methods of polymer characterization

1. Classifications of synthetic methods
2. Condensation/step growth polymerization techniques
3. Addition or chain growth polymerizations
4. Anionic, cationic and emulsion polymerization
5. Free radical chain polymerization
6. Copolymerization
7. Kinetics of polymerizations
8. Testing and spectroscopic characterizations of polymers

D. Required Text:


Note: Instructor reserves the right to change the required text books for better learning experience of the students.

E. Prerequisites: CHEM 360 or permission of instructor
II. Course Objectives

The course is designed to:

1. introduce basic of polymer chemistry and synthesis
2. introduce students to the different kinds of polymers and their synthetic approaches
3. develop basic concepts of polymer synthesis and mechanism
4. introduce kinetics of polymerization
5. introduce techniques of copolymerization
6. introduce various concepts of polymer characterization techniques
7. study various properties of polymers

III. Course Requirements

A. Participation in the course work:

Regular participation is very important for the successful completion of the course work. It is your responsibility to attend classes regularly and keep up to date with the lecture material so that you do not fall behind. As is true with most sciences, polymer chemistry is a structured subject. This means that an understanding of the course material will depend heavily upon an understanding of preceding material. Also please keep in mind that mere memorization of the facts without understanding the subject matter is almost certain to result in a poor performance in the course. In fact, the goal of each quiz and exam will be to evaluate understanding of the course material as opposed to mere memorization. This means that you will ultimately be expected to utilize the basic principles taught in this course in the solution of new problem situations.

There will be no “extra credit” work in this course.

B. Homework:

A series of exercises are given at the end of each chapter in your text. You will be responsible for learning to solve these problems. This helps you to understand critically the subject matter of the chapter. On the other hand, the quizzes, tests, and even final examinations will resemble these one or more of the exercises that are assigned below. You should therefore view learning how to do these exercises as a high priority. Learning how to do these exercises at the end of each chapter that have not been assigned should also prove helpful.
IV. Evaluation of Performance

Your grade in this course will be determined by a series of tests, a series of quizzes, and a comprehensive final examination. Each test will be weighted at 15% of your grade. The final exam will be comprehensive in nature, will be worth 15% of your grade.

The quizzes will be given during the class period (either at the beginning or at the end) and will cover exercises from the text that were assigned as homework and topics covered in the class. No makeup examinations or quizzes will be given unless prior permission was taken for absences.

Four tests: 60 points
Four quizzes: 10 points
Homework: 10 points
Comprehensive Final: 15 points
Regular Participation: 5 points

Total = 100 points

Your overall letter grade for the course will be determined using the following scale:

<table>
<thead>
<tr>
<th>Total Score</th>
<th>Letter Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 85%</td>
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<tr>
<td>&lt;40%</td>
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</table>

V. Texts


Note: Instructor reserves the right to change the required text books for better learning experience of the students.

Recommended: Calculator with scientific notation.
VI. Calendar

Tentative Quiz Topics and Dates

Quiz 1: TBA
Quiz 2: TBA
Quiz 3: TBA
Quiz 4: TBA

Tentative Examination Topics and Dates

Exam 1: TBA
Exam 2: TBA
Exam 3: TBA
Exam 4: TBA

Comprehensive Final Examination: According to University Final Exam Schedule. PLEASE Don’t make any travel plans that conflicts with your Exam Schedule.

Please note that the examination topics to be covered are approximate only. The materials covered in each examination will be announced in the lecture class.

The purpose of each examination is to evaluate the understanding of the course material, as opposed to mere memorization. This means that the student will ultimately be expected to utilize basic principles in the solution of new problem situations.

VII. Academic Misconduct

You will be allowed to use a non-programmable calculator during the quizzes and examinations in this course. No other help is allowed. Use of other materials, information or persons during a quiz or exam will be viewed as cheating. In other words, collaborative efforts to answer quiz or exam questions are strictly forbidden, and your answers to quiz or exam questions must be the result of strictly individual efforts. Evidence of cheating as defined above will result in a grade of zero for that quiz or exam for the first offense, even if the cheating activity involves only one question. In the second instance of such activity, the instructor will proceed with formal charges against the student, to effect, at least a failing grade in the course. Please consult the policy on Student Academic Dishonesty on in the University Catalog (2013-2014).
VIII. Disclaimer: Instructor reserves the right to revise the content of the syllabus as needed throughout the semester for better learning experience of the students.
Request for New Course Template
(Undergraduate Course Numbers through Course Number 699)

Department: Chemistry College: College of Arts and Sciences

Date of Submission to the Department: 08/12/2013

Contact Person: Dr. Dilip Paul □ Faculty member ■ Chair

Title of Course: Polymer synthesis and characterizations laboratory
Credit Hours: 2

Course Number: CHEM 626
Hegis Number: ______

Date first offered: 2014
(Semester/Year)

To be Offered: ■ Fall ■ Spring ■ Summer
(check all that apply)

Estimated Enrollment: 20

Prerequisite(s): CHEM 625 or permission of instructor

This course is: ■ Required ■ Elective

If this course is "required," which major(s) will require it? Polymer Chemistry

Course Description: Polymer experiments to accompany CHEM 625 Polymer synthesis and characterizations
(as it will appear in the catalog)

Purpose/Justification for Course: To learn various methods of polymer synthesis and their characterizations
in laboratory environment

Objectives/Student Learning Outcomes:
Students will learn techniques of chemical and polymer synthesis and their characterization techniques

Assessment Strategies (e.g. exams, projects, university rubrics, etc.):
Writing everyday lab reports, data analysis, interpretation of results, lab tests, and presentations

PLEASE ATTACH SYLLABUS

Additional Resources Required (e.g. library or multimedia resources, technology, space, major expense, etc.):
Library

Will any additional student fees be required (e.g. equipment, clothing, travel, licensing, etc.)? ■ Yes ■ No

If "yes," please realize that it will need to gain approval of the President's Council.

Rationale: ______
Is this course to be considered for General Education?  □ Yes  ☒ No

If “yes,” please indicate the University’s General Education Goals met by this course AND the assessment data that will be collected to measure these goals:

Please realize that it will need to gain approval of the General Education Committee.

Will this course be required of any education majors?  □ Yes  ☒ No

If “yes,” please realize that it will need to have the approval of the Teacher Education Council.

Will this course be submitted for Departmental Academic Honors?  □ Yes  ☒ No

If “yes,” please realize that it will need to have the approval of the Faculty Senate Departmental Academic Honors Committee.

What additional costs will be required for this course (e.g. staffing, equipment, etc.)?  Costs are covered by the polymer initiative

Will this course impact any other department/college/unit’s curricula or programs?  □ Yes  ☒ No

If “yes,” have relevant discussions occurred?  □ Yes  ☐ No

Documentation of these discussions (e.g. copies of e-mails, memos, etc.) is required to be attached.

Originating Department: Please complete this form and upload, with syllabus, to the Zimbra Briefcase, “Undergraduate Curriculum Legislation” (within the appropriate College folder, “Preliminary Legislation”), to allow for review and questions. Any modifications should be saved as “original file name.version2.docx” (e.g. MATH 343.version 2.docx) and uploaded as well.

Please print the final version of this form, apply the appropriate signature, and forward to the Office of the Registrar.
PITTSBURG STATE UNIVERSITY

LEGISLATIVE PROCESS
AUTHORIZATION/NOTIFICATION SIGN-OFF SHEET

Signatures:

☑ Approved: Department Chairperson
  Date 7/13/13Signature, Department Chairperson
  
☑ Approved: College Curriculum Committee
  Date 6/7/13Signature, College Curriculum Committee Chair

☑ Approved: Dean of College
  Date 7/4/13Signature, Dean

☑ Approved: General Education Committee (if applicable)
  Date Signature, General Education Committee Chair

☑ Approved: Teacher Education Council (if applicable)
  Date Signature, Teacher Education Council Chair

☑ Approved: Faculty Senate University Undergraduate Curriculum Committee
  Date 11/13/13Signature, Undergraduate Curriculum Committee Chair

☑ Approved: Faculty Senate
  Date Signature, Recording Secretary, Faculty Senate

Please Note
This is a two-to-three-month process, at least, and is designed to eliminate questions and concerns at the beginning of the process. Any questions/concerns not addressed prior to the review by the College Curriculum Committee and the Faculty Senate Undergraduate Curriculum Committee may result in an additional month added to the process.
Attach syllabus here:
Please see attached file.
COURSE DESCRIPTION

CHEM 626: Polymer synthesis and characterizations laboratory (2 hrs)

Polymer experiments to accompany CHEM 625 Polymer synthesis and characterizations

Prerequisite/corequisite: CHEM 625 or permission of instructor

Purpose/justification for course: to learn various methods of polymer synthesis and their characterizations in laboratory environment

Objectives/Student Learning Outcomes: Students will learn techniques of chemical and polymer synthesis and their characterization techniques.

Assessment Strategies: Writing everyday lab reports, data analysis, interpretation of results, lab tests, and presentations.
Course Syllabus

CHEM 626: Polymer synthesis and characterizations laboratory

Instructor: CHEM/PET Faculty
Email: TBD
Phone No.: TBD

Office: TBD
Lecture room: TBD
Office Hours: TBD

I. Descriptive Information

A. Course Number: CHEM 626

B. Course Title and Credits: Polymer synthesis and characterizations laboratory (2 credits)

C. Description of the Course: Polymer experiments to accompany CHEM 625 Polymer synthesis and characterizations

1. Synthesis of various acrylic acid based polymers
2. Synthesis of polyesters and polyamides
3. Polyurethanes and cast resin and foams
4. Various techniques of polymer characterizations

D. Required Text:


Note: Instructor reserves the right to change the required text books for better learning experience of the students.

E. Prerequisites/corequisite: CHEM 625 or permission of instructor
II. Course Objectives

The Course is designed to:

1. learn chemical synthesis setups
2. introduce basic concepts of polymer synthesis in laboratory
3. introduce techniques of various polymer synthesis
4. Various approaches of polymer purifications
5. introduce various methods of polymer characterization techniques
6. Study various properties of polymers

III. Course Requirements

A. Participation in the course work:

Regular participation is very important for the successful completion of the course work. It is your responsibility to attend classes regularly and keep up to date with the lecture material so that you do not fall behind. As is true with most sciences, polymer chemistry is a structured subject. This means that an understanding of the course material will depend heavily upon an understanding of preceding material. Also please keep in mind that mere memorization of the facts without understanding the subject matter is almost certain to result in a poor performance in the course. In fact, the goal of each quiz and exam will be to evaluate understanding of the course material as opposed to mere memorization. This means that you will ultimately be expected to utilize the basic principles taught in this course in the solution of new problem situations.

There will be no “extra credit” work in this course.

B. Homework:

A series of literature will be given during the courses. You will be responsible learn experimental techniques effectively. This helps you to understand critically how to perform laboratory experiments and finish your projects on time. You should therefore view learning how to perform these daily experimental exercises as a high priority.
IV. Evaluation of Performance

Your grade in this course will be determined by a series of laboratory tests, successes on research projects, analytical and data interpretation skills and final presentation of the research work. No makeup evaluation will be given unless prior permission was taken for absences. The division of the percentage grade is given below:

- Lab report writing: 20 points
- Experimental skills: 15 points
- Regular Participation: 15 points
- Homework: 10 points
- Final lab test: 25 points
- Final Presentation: 15 points

Total = 100 points

Your overall letter grade for the course will be determined using the following scale:

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<tr>
<td>&gt;40%</td>
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V. Texts


Note: Instructor reserves the right to change the required text books for better learning experience of the students.

Recommended: Calculator with scientific notation.
VI. Calendar

**Tentative Quiz Topics and Dates**

Quiz 1: TBA
Quiz 2: TBA
Quiz 3: TBA
Quiz 4: TBA

**Tentative Examination Topics and Dates**

Exam 1: TBA
Exam 2: TBA
Exam 3: TBA
Exam 4: TBA

**Comprehensive Final Examination:** According to University Final Exam Schedule. PLEASE Don’t make any travel plans that conflicts with your Exam Schedule.

Please note that the examination topics to be covered are approximate only. The materials covered in each examination will be announced in the lecture class.

The purpose of each examination is to evaluate the understanding of the course material, as opposed to mere memorization. This means that the student will ultimately be expected to utilize basic principles in the solution of new problem situations.

VII. Academic Misconduct

You will be allowed to use a non-programmable calculator during the quizzes and examinations in this course. No other help is allowed. Use of other materials, information or persons during a quiz or exam will be viewed as cheating. In other words, collaborative efforts to answer quiz or exam questions are strictly forbidden, and your answers to quiz or exam questions must be the result of strictly individual efforts. Evidence of cheating as defined above will result in a grade of zero for that quiz or exam for the first offense, even if the cheating activity involves only one question. In the second instance of such activity, the instructor will proceed with formal charges against the student, to effect, at least a failing grade in the course. Please consult the policy on Student Academic Dishonesty on in the University Catalog (2013-2014).
VIII. Disclaimer: Instructor reserves the right to revise the content of the syllabus as needed throughout the semester for better learning experience of the students.
Department: Chemistry  
College: College of Arts and Sciences

Date of Submission to the Department: 08/12/2013

Contact Person: Dr. Dilip Paul  
☐ Faculty member  ☑ Chair

Title of Course: Polyurethanes and their applications  
Credit Hours: 3

Course Number: CHEM 640  
Hegis Number: ____

Date first offered: 2014  
(Semester/Year)

To be Offered: ☑ Fall  ☑ Spring  ☑ Summer  
(check all that apply)

Estimated Enrollment: 20

Prerequisite(s): CHEM 620 or permission of instructor

This course is:  ☐ Required  ☑ Elective

If this course is “required,” which major(s) will require it? Polymer Chemistry

Course Description: Introduction to polyurethanes, types of polyurethanes, structure-property correlation, various synthetic approaches for polyurethanes, elastomers, thermoplastics and foams, polyurethane composites and applications  
(as it will appear in the catalog)

Purpose/Justification for Course: Introduction to the concepts of various types of polyurethanes and their applications

Objectives/Student Learning Outcomes:  
This course will introduce the concept of polyurethanes synthesis and their applications in industrial settings

Assessment Strategies (e.g. exams, projects, university rubrics, etc.):  
Quizzes, written tests, and final examinations

PLEASE ATTACH SYLLABUS

Additional Resources Required (e.g. library or multimedia resources, technology, space, major expense, etc.):  
Library

Will any additional student fees be required (e.g. equipment, clothing, travel, licensing, etc.)?  ☐ Yes  ☑ No

If “yes,” please realize that it will need to gain approval of the President’s Council.
Is this course to be considered for General Education?  □ Yes  □ No

If “yes,” please indicate the University’s General Education Goals met by this course AND the assessment data that will be collected to measure these goals:

Please realize that it will need to gain approval of the General Education Committee.

Will this course be required of any education majors?  □ Yes  □ No

If “yes,” please realize that it will need to have the approval of the Teacher Education Council.

Will this course be submitted for Departmental Academic Honors?  □ Yes  □ No

If “yes,” please realize that it will need to have the approval of the Faculty Senate Departmental Academic Honors Committee.

What additional costs will be required for this course (e.g. staffing, equipment, etc.)? Costs are covered by the polymer initiative.

Will this course impact any other department/college/unit’s curricula or programs?  □ Yes  □ No

If “yes,” have relevant discussions occurred?  □ Yes  □ No

Documentation of these discussions (e.g. copies of e-mails, memos, etc.) is required to be attached.

Originating Department: Please complete this form and upload, with syllabus, to the Zimbra Briefcase, “Undergraduate Curriculum Legislation” (within the appropriate College folder, “Preliminary Legislation”), to allow for review and questions. Any modifications should be saved as “original file name.version2.docx” (e.g. MATH 343.version 2.docx) and uploaded as well.

Please print the final version of this form, apply the appropriate signature, and forward to the Office of the Registrar.
PITTSBURG STATE UNIVERSITY

LEGISLATIVE PROCESS
AUTHORIZATION/NOTIFICATION SIGN-OFF SHEET

Signatures:

☑ Approved: Department Chairperson
   Date 9/3/13 Signature, Department Chairperson
   [Signature]

☑ Approved: College Curriculum Committee
   Date 10/7/13 Signature, College Curriculum Committee Chair
   [Signature]

☑ Approved: Dean of College
   Date 9/4/13 Signature, Dean
   [Signature]

☐ Approved: General Education Committee (if applicable)
   Date ______ Signature, General Education Committee Chair

☐ Approved: Teacher Education Council (if applicable)
   Date ______ Signature, Teacher Education Council Chair

☐ Approved: Faculty Senate University Undergraduate Curriculum Committee
   Date 11/18 Signature, Undergraduate Curriculum Committee Chair
   [Signature]

☐ Approved: Faculty Senate
   Date ______ Signature, Recording Secretary, Faculty Senate

Please Note
This is a two-to-three-month process, at least, and is designed to eliminate questions and concerns at the beginning of the process. Any questions/concerns not addressed prior to the review by the College Curriculum Committee and the Faculty Senate Undergraduate Curriculum Committee may result in an additional month added to the process.
Attach syllabus here:
Please see attached file.
COURSE DESCRIPTION

CHEM 640: Polyurethanes and their applications (3 hrs)

Introduction to polyurethanes, types of polyurethanes, structure-property correlation, various synthetic approaches for polyurethanes, elastomers, thermoplastics and foams, polyurethane composites and applications

Prerequisite/corequisite: CHEM 620 or permission of instructor

Purpose/Justification for course: Introduction to the concepts of various types of polyurethanes and their applications.

Objectives/Student Learning Outcomes: This course will introduce the concept of polyurethanes synthesis and their applications in industrial settings.

Assessment Strategies: Quizzes, written tests, and final examination
Course Syllabus

CHEM 640: Polyurethanes and their applications

Instructor: CHEM/PET Faculty
Email: TBD
Phone No.: TBD

Office: TBD
Lecture room: TBD
Office Hours: TBD

I. Descriptive Information

A. Course Number: CHEM 640

B. Course Title and Credits: Polyurethanes and their applications (3 hrs)

C. Description of the Course: Introduction to polyurethanes, types of polyurethanes, structure-property correlation, various synthetic approaches for polyurethanes, elastomers, thermoplastics and foams, polyurethane composites and applications

1. Basic concepts in polyurethanes chemistry and technology
2. Structure-property correlation in polyurethanes
3. Basic and advanced techniques for polyurethane synthesis
4. The life cycle of polyurethanes
5. Rigid and flexible polyurethane foam
6. Polyurethanes additives and fillers
7. Application of polyurethanes as elastomers and composites
8. The global polyurethanes market

D. Required Text:

1. The Polyurethanes Book, by David Randall and Steve Lee, Wiley

Note: Instructor reserves the right to change the required text books for better learning experience of the students.
E. Prerequisites: CHEM 620 or permission of instructor

II. Course Objectives

The Course is designed to:

1. introduce to the world of polyurethanes
2. relay different techniques for polyurethane synthesis
3. understand the role of different isocyanate on polyurethane synthesis
4. understand polyurethanes as blowing agents
5. bring polyurethane composite technologies
6. introduce various applications of polyurethane

III. Course Requirements

A. Participation in the course work:

Regular participation is very important for the successful completion of the course work. It is your responsibility to attend classes regularly and keep up to date with the lecture material so that you do not fall behind. As is true with most sciences, polymer chemistry is a structured subject. This means that an understanding of the course material will depend heavily upon an understanding of preceding material. Also please keep in mind that mere memorization of the facts without understanding the subject matter is almost certain to result in a poor performance in the course. In fact, the goal of each quiz and exam will be to evaluate understanding of the course material as opposed to mere memorization. This means that you will ultimately be expected to utilize the basic principles taught in this course in the solution of new problem situations.

*There will be no “extra credit” work in this course.*

B. Homework:

A series of exercises are given at the end of each chapter in your text. You will be responsible for learning to solve these problems. This helps you to understand critically the subject matter of the chapter. On the other hand, the quizzes, tests, and even final examinations will resemble these one or more of the exercises that are assigned below. You should therefore view learning how to do these exercises as a high priority.
Learning how to do these exercises at the end of each chapter that have not been assigned should also prove helpful.

IV. Evaluation of Performance

Your grade in this course will be determined by a series tests, a series of quizzes, and a comprehensive final examination. Each test will be weighted at 15% of your grade. The final exam will be comprehensive in nature, will be worth 15% of your grade.

The quizzes will be given during the class period (either at the beginning or at the end) and will cover exercises from the text that were assigned as homework and topics covered in the class. No makeup examinations or quizzes will be given unless prior permission was taken for absences.

Four tests: 60 points
Four quizzes: 10 points
Homework: 10 points
Comprehensive Final: 15 points
Regular Participation: 5 points

Total = 100 points

Your overall letter grade for the course will be determined using the following scale:

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V. Texts

1. The Polyurethanes Book, by David Randall and Steve Lee, Wiley
Note: Instructor reserves the right to change the required text books for better learning experience of the students.

Recommended: Calculator with scientific notation.

VI. Calendar

**Tentative Quiz Topics and Dates**

- Quiz 1: TBA
- Quiz 2: TBA
- Quiz 3: TBA
- Quiz 4: TBA

**Tentative Examination Topics and Dates**

- Exam 1: TBA
- Exam 2: TBA
- Exam 3: TBA
- Exam 4: TBA

Comprehensive Final Examination: According to University Final Exam Schedule. PLEASE Don't make any travel plans that conflicts with your Exam Schedule.

Please note that the examination topics to be covered are approximate only. The materials covered in each examination will be announced in the lecture class.

The purpose of each exam is to evaluate the understanding of the course material, as opposed to mere memorization. This means that the student will ultimately be expected to utilize basic principles in the solution of new problem situations.

VII. Academic Misconduct

You will be allowed to use a non-programmable calculator during the quizzes and examinations in this course. No other help is allowed. Use of other materials, information or persons during a quiz or exam will be viewed as cheating. In other words, collaborative efforts
to answer quiz or exam questions are strictly forbidden, and your answers to quiz or exam questions must be the result of strictly individual efforts. Evidence of cheating as defined above will result in a grade of zero for that quiz or exam for the first offense, even if the cheating activity involves only one question. In the second instance of such activity, the instructor will proceed with formal charges against the student, to effect, at least a failing grade in the course. 

*Please consult the policy on Student Academic Dishonesty on in the University Catalog (2013-2014).*

**VIII. Disclaimer:** Instructor reserves the right to revise the content of the syllabus as needed throughout the semester for better learning experience of the students.
Request for New Course Template
(Undergraduate Course Numbers through Course Number 699)

Department: Chemistry    College: College of Arts and Sciences

Date of Submission to the Department: 08/12/2013

Contact Person: Dr. Dilip Paul    □ Faculty member □ Chair

Title of Course: Conducting polymers and their applications    Credit Hours: 3

Course Number: CHEM 650    Hegis Number: ____

Date first offered: 2014
(Semester/Year)

To be Offered: □ Fall   ☑ Spring   ☑ Summer
(check all that apply)    Estimated Enrollment: 20

Prerequisite(s): CHEM 360 and CHEM 625 or permission of instructor

This course is: □ Required   □ Elective

If this course is “required,” which major(s) will require it? Polymer Chemistry

Course Description: Definitions and basic understanding of conducting polymers, electronic properties and band theories, metallic state of conducting polymers, conjugated polymers as semiconductors, applications of conducting polymers
(as it will appear in the catalog)

Purpose/Justification for Course: Introduction to the basic concepts of conducting polymers and their applications

Objectives/Student Learning Outcomes:
This course will introduce basic knowledge of conducting polymers, synthesis methodology and their applications

Assessment Strategies (e.g. exams, projects, university rubrics, etc.):
Quizzes, written tests, and final examinations

PLEASE ATTACH SYLLABUS

Additional Resources Required (e.g. library or multimedia resources, technology, space, major expense, etc.):
Library

Will any additional student fees be required (e.g. equipment, clothing, travel, licensing, etc.)? □ Yes   □ No

If “yes,” please realize that it will need to gain approval of the President’s Council.
Is this course to be considered for General Education? Yes ☐ No ☑

If “yes,” please indicate the University’s General Education Goals met by this course AND the assessment data that will be collected to measure these goals:

Please realize that it will need to gain approval of the General Education Committee.

Will this course be required of any education majors? Yes ☐ No ☑

If “yes,” please realize that it will need to have the approval of the Teacher Education Council.

Will this course be submitted for Departmental Academic Honors? Yes ☐ No ☑

If “yes,” please realize that it will need to have the approval of the Faculty Senate Departmental Academic Honors Committee.

What additional costs will be required for this course (e.g. staffing, equipment, etc.)? Costs are covered by the polymer initiative.

Will this course impact any other department/college/unit’s curricula or programs? Yes ☐ No ☑

If “yes,” have relevant discussions occurred? Yes ☐ No ☐

Documentation of these discussions (e.g. copies of e-mails, memos, etc.) is required to be attached.

Originating Department: Please complete this form and upload, with syllabus, to the Zimbra Briefcase, “Undergraduate Curriculum Legislation” (within the appropriate College folder, “Preliminary Legislation”), to allow for review and questions. Any modifications should be saved as “original file name.version2.docx” (e.g. MATH 343.version 2.docx) and uploaded as well.

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PITTSBURG STATE UNIVERSITY

LEGISLATIVE PROCESS
AUTHORIZATION/NOTIFICATION SIGN-OFF SHEET

Signatures:

Approved: Department Chairperson
Date 9/13/2013
Signature, Department Chairperson

Approved: College Curriculum Committee
Date 10/7/13
Signature, College Curriculum Committee Chair

Approved: Dean of College
Date 9/4/13
Signature, Dean

Approved: General Education Committee (if applicable)
Date _______ Signature, General Education Committee Chair

Approved: Teacher Education Council (if applicable)
Date _______ Signature, Teacher Education Council Chair

Approved: Faculty Senate University Undergraduate Curriculum Committee
Date 11/8/13
Signature, Undergraduate Curriculum Committee Chair

Approved: Faculty Senate
Date _______ Signature, Recording Secretary, Faculty Senate

Please Note
This is a two-to-three-month process, at least, and is designed to eliminate questions and concerns at the beginning of the process. Any questions/concerns not addressed prior to the review by the College Curriculum Committee and the Faculty Senate Undergraduate Curriculum Committee may result in an additional month added to the process.
Attach syllabus here:
Please see attached file.
COURSE DESCRIPTION

CHME 650: Conducting polymers and their applications (3 hrs)

Definitions and basic understanding of conducting polymers, electronic properties and band theories, metallic state of conducting polymers, conjugated polymers as semiconductors, applications of conducting polymers.

Prerequisite/corequisite: CHEM 360 and CHEM 625 or permission of instructor

Purpose/Justification for course: Introduction to the basic concepts of conducting polymers and their applications.

Objectives/Student Learning Outcomes: This course will introduce basic knowledge of conducting polymers, synthesis methodology and their applications.

Assessment Strategies: Quizzes, written tests, and final examination
Course Syllabus

CHEM 650: Conducting polymers and their applications

Instructor: CHEM/PET Faculty
Email: TBD
Phone No.: TBD

Office: TBD
Lecture room: TBD
Office Hours: TBD

I. Descriptive Information

A. Course Number: CHEM 650

B. Course Title and Credits: Conducting polymers and their applications (3 hrs)

C. Description of the Course: Definitions and basic understanding of conducting polymers, electronic properties and band theories, metallic state of conducting polymers, conjugated polymers as semiconductors, applications of conducting polymers

1. Electronic properties of conducting polymers
2. Classifications and nomenclature of conducting polymers
3. Doping of conducting polymers
4. Polyaniline as promising conducting polymers
5. Metal-insulator transition in conducting polymers
6. Conducting polymers for light emitting diodes and sensors
7. Application of conducting polymers for photovoltaic cell

D. Required Text:

1. Semiconducting and Metallic Polymers, by Alan J. Heeger, Niyazi Serdar Sariciftci, Ebinazar B. Namdas, Oxford University Press

2. Conducting Polymers with Micro or Nanometer Structure, by Meixiang Wan, Springer

Note: Instructor reserves the right to change the required text books for better learning experience of the students.
E. Prerequisites: CHEM 360 and CHEM 625 or permission of instructor

II. Course Objectives

The Course is designed to:

1. introduce basic concepts of conducting polymers to the students
2. introduce students to the classifications of conducting polymers and their properties
3. introduce the concept of synthesis and characterizations
4. bring new knowledge of conducting polymers for their unique applications as LEDs, solar cells, and sensors
5. develop skills of applying conducting polymers in daily life

III. Course Requirements

A. Participation in the course work:

Regular participation is very important for the successful completion of the course work. It is your responsibility to attend classes regularly and keep up to date with the lecture material so that you do not fall behind. As is true with most sciences, polymer chemistry is a structured subject. This means that an understanding of the course material will depend heavily upon an understanding of preceding material. Also please keep in mind that mere memorization of the facts without understanding the subject matter is almost certain to result in a poor performance in the course. In fact, the goal of each quiz and exam will be to evaluate understanding of the course material as opposed to mere memorization. This means that you will ultimately be expected to utilize the basic principles taught in this course in the solution of new problem situations.

There will be no “extra credit” work in this course.

B. Homework:

A series of exercises are given at the end of each chapter in your text. You will be responsible for learning to solve these problems. This helps you to understand critically the subject matter of the chapter. On the other hand, the quizzes, tests, and even final examinations will resemble these one or more of the exercises that are assigned below. You should therefore view learning how to do these exercises as a high priority.
Learning how to do these exercises at the end of each chapter that have not been assigned should also prove helpful.

**IV. Evaluation of Performance**

Your grade in this course will be determined by a series tests, a series of quizzes, and a comprehensive final examination. Each test will be weighted at 15% of your grade. The final exam will be comprehensive in nature, will be worth 15% of your grade.

The quizzes will be given during the class period (either at the beginning or at the end) and will cover exercises from the text that were assigned as homework and topics covered in the class. **No makeup examinations or quizzes will be given** unless prior permission was taken for absences.

- Four tests: 60 points
- Four quizzes: 10 points
- Homework: 10 points
- Comprehensive Final: 15 points
- Regular Participation: 5 points

**Total = 100 points**

Your overall letter grade for the course will be determined using the following scale:

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**V. Texts**

1. Semiconducting and Metallic Polymers, by Alan J. Heeger, Niyazi Serdar Sariciftci, Ebinazar B. Namdas, Oxford University Press

2. Conducting Polymers with Micro or Nanometer Structure, by Meixiang Wan, Springer
Note: Instructor reserves the right to change the required text books for better learning experience of the students.

Recommended: Calculator with scientific notation.

VI. Calendar

Tentative Quiz Topics and Dates

Quiz 1: TBA
Quiz 2: TBA
Quiz 3: TBA
Quiz 4: TBA

Tentative Examination Topics and Dates

Exam 1: TBA
Exam 2: TBA
Exam 3: TBA
Exam 4: TBA

Comprehensive Final Examination: According to University Final Exam Schedule. PLEASE Don't make any travel plans that conflicts with your Exam Schedule.

Please note that the examination topics to be covered are approximate only. The materials covered in each examination will be announced in the lecture class.

The purpose of each exam. is to evaluate the understanding of the course material, as opposed to mere memorization. This means that the student will ultimately be expected to utilize basic principles in the solution of new problem situations.

VII. Academic Misconduct

You will be allowed to use a non-programmable calculator during the quizzes and examinations in this course. No other help is allowed. Use of other materials, information or persons during a quiz or exam will be viewed as cheating. In other words, collaborative efforts
to answer quiz or exam questions are strictly forbidden, and your answers to quiz or exam questions must be the result of strictly individual efforts. Evidence of cheating as defined above will result in a grade of zero for that quiz or exam for the first offense, even if the cheating activity involves only one question. In the second instance of such activity, the instructor will proceed with formal charges against the student, to effect, at least a failing grade in the course. Please consult the policy on Student Academic Dishonesty on in the University Catalog (2013-2014).

**VIII. Disclaimer:** Instructor reserves the right to revise the content of the syllabus as needed throughout the semester for better learning experience of the students.
Request for New Course Template
(Undergraduate Course Numbers through Course Number 699)

Department: Chemistry     College: College of Arts and Sciences

Date of Submission to the Department: 08/12/2013

Contact Person: Dr. Dilip Paul     ☐ Faculty member    ☒ Chair

Title of Course: Senior research in polymer chemistry
Credit Hours: 1

Course Number: CHEM 670
Hegis Number:    

Date first offered: 2014
(Semester/Year)

To be Offered: ☒ Fall    ☒ Spring    ☒ Summer
(check all that apply)    Estimated Enrollment: 20

Prerequisite(s): CHEM 325 or CHEM 360 or permission of instructor

This course is: ☐ Required    ☒ Elective

If this course is “required,” which major(s) will require it? Polymer Chemistry

Course Description: Synthesis of advanced polymers, polymeric materials, biopolymers and polyurethanes. Preparation of polyurethane composites and smart polymers. Polymer research problems (as it will appear in the catalog)

Purpose/Justification for Course: Advanced polymer research for special applications in polymer science and technology

Objectives/Student Learning Outcomes:
Students will have advanced hands-on experience in polymer synthesis, characterization and their applications

Assessment Strategies (e.g. exams, projects, university rubrics, etc.):
Writing everyday lab reports, data analysis, interpretation of results, lab tests, and presentations

PLEASE ATTACH SYLLABUS

Additional Resources Required (e.g. library or multimedia resources, technology, space, major expense, etc.):
Library

Will any additional student fees be required (e.g. equipment, clothing, travel, licensing, etc.)? ☐ Yes    ☒ No

If “yes,” please realize that it will need to gain approval of the President’s Council.

Rationale:    


Is this course to be considered for General Education? □ Yes  X No

If “yes,” please indicate the University’s General Education Goals met by this course AND the assessment data that will be collected to measure these goals:

Please realize that it will need to gain approval of the General Education Committee.

Will this course be required of any education majors? □ Yes  X No

If “yes,” please realize that it will need to have the approval of the Teacher Education Council.

Will this course be submitted for Departmental Academic Honors? □ Yes  X No

If “yes,” please realize that it will need to have the approval of the Faculty Senate Departmental Academic Honors Committee.

What additional costs will be required for this course (e.g. staffing, equipment, etc.)? Costs are covered by the polymer initiative.

Will this course impact any other department/college/unit’s curricula or programs? □ Yes  X No

If “yes,” have relevant discussions occurred? □ Yes  □ No

Documentation of these discussions (e.g. copies of e-mails, memos, etc.) is required to be attached.

Originating Department: Please complete this form and upload, with syllabus, to the Zimbra Briefcase, “Undergraduate Curriculum Legislation” (within the appropriate College folder, “Preliminary Legislation”), to allow for review and questions. Any modifications should be saved as “original file name.version2.docx” (e.g. MATH 343.version 2.docx) and uploaded as well.

Please print the final version of this form, apply the appropriate signature, and forward to the Office of the Registrar.
PITTSBURG STATE UNIVERSITY

LEGISLATIVE PROCESS
AUTHORIZATION/NOTIFICATION SIGN-OFF SHEET

Signatures:

☑ Approved: Department Chairperson
   Date 9/3/2012 Signature, Department Chairperson
   Signature

☑ Approved: College Curriculum Committee
   Date 6/7/11 Signature, College Curriculum Committee Chair
   Signature

☑ Approved: Dean of College
   Date 9/4/11 Signature, Dean
   Signature

☐ Approved: General Education Committee (if applicable)
   Date ______ Signature, General Education Committee Chair
   Signature

☐ Approved: Teacher Education Council (if applicable)
   Date ______ Signature, Teacher Education Council Chair
   Signature

☐ Approved: Faculty Senate University Undergraduate Curriculum Committee
   Date 9/17/11 Signature, Undergraduate Curriculum Committee Chair
   Signature

☐ Approved: Faculty Senate
   Date ______ Signature, Recording Secretary, Faculty Senate
   Signature

Please Note
This is a two-to-three-month process, at least, and is designed to eliminate questions and concerns at the beginning of the process. Any questions/concerns not addressed prior to the review by the College Curriculum Committee and the Faculty Senate Undergraduate Curriculum Committee may result in an additional month added to the process.
Attach syllabus here:
Please see attached file.
COURSE DESCRIPTION

CHEM 670: Senior research in polymer chemistry (1 hr)

Synthesis of advanced polymers, polymeric materials, biopolymers and polyurethanes. Preparation of polyurethane composites and smart polymers. Polymer research problems.

Prerequisite/corequisite: CHEM 325 or CHEM 360 or permission of instructor

Purpose/Justification for course: Advanced polymer research for special applications in polymer science and technology

Objectives/Student Learning Outcomes: Students will have advanced hands-on experience in polymer synthesis, characterization and their applications.

Assessment Strategies: Writing everyday lab reports, data analysis, interpretation of results, lab tests, and presentations.
Course Syllabus

CHEM 670: Senior research in polymer chemistry

Instructor: CHEM/PET Faculty
Email: TBD
Phone No.: TBD

Office: TBD
Lecture room: TBD
Office Hours: TBD

I. Descriptive Information

A. Course Number: CHEM 670

B. Course Title and Credits: Senior research in polymer chemistry (1 credit)

C. Description of the Course: Synthesis of advanced polymers, polymeric materials, biopolymers and polyurethanes. Preparation of polyurethane composites and smart polymers. Polymer research problems.

1. Synthesis of specialized polymers
2. Polyurethanes and biodegradable polymers
3. Characterization of synthesized polymers
4. Basic applications
5. Writing laboratory reports
6. Presentations of the research outcome
7. Polymer research problems.

D. Required Text:

1. Laboratory Safety for Chemistry Students, by Robert H. Hill and David Finster, Wiley

Note: Instructor reserves the right to change the required text books for better learning experience of the students.

E. Prerequisites: CHEM 325 or CHEM 360 or permission of instructor
II. Laboratory Course Objectives

The laboratory course is designed to:

1. Updating the knowledge of chemical laboratory safety
2. Learn how to handle glasswares, chemicals, and equipment
3. Introduce advanced concepts of polymer synthesis
4. Introduction of advanced characterization techniques
5. Get experience in designing novel polymers for advanced application
6. Develop skills in critical thinking through designing new polymers
7. Develop advanced skills of analyzing data
8. Maintain laboratory notebook

III. Course Requirements

A. Participation in the laboratory:

Regular participation is very important for the successful completion of the research work. It is your responsibility to attend laboratory regularly and keep up to date with the experimental techniques in laboratory notebook so that you do not fall behind. As is true with most sciences, polymer chemistry is a structured subject. This means that an understanding of the laboratory protocols will depend heavily upon an understanding of laboratory techniques involved in research. Also please keep in mind that mere memorization of the facts without understanding the subject matter is almost certain to result in a poor performance in this laboratory course. In fact, the goal of each experiment and presentation will evaluate your understanding of the course material as opposed to mere memorization. This means that you will ultimately be expected to utilize the basic principles learnt in this course.

*There will be no "extra credit" work in this course.*

B. Homework:

A series of literature will be given during the courses. You will be responsible learn experimental techniques effectively. This helps you to understand critically how to perform laboratory experiments and finish your projects on time. You should therefore view learning how to perform these daily experimental exercises as a high priority.
IV. Evaluation of Performance

Your grade in this course will be determined by a series of laboratory tests, successes on research projects, analytical and data interpretation skills and final presentation of the research work. No makeup evaluation will be given unless prior permission was taken for absences. The division of the percentage grade is given below:

- Lab report writing: 20 points
- Experimental skills: 15 points
- Regular Participation: 15 points
- Home work: 10 points
- Final lab test: 25 points
- Final Presentation: 15 points

Total = 100 points

Your overall letter grade for the course will be determined using the following scale:

<table>
<thead>
<tr>
<th>Total Score</th>
<th>Letter Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 85%</td>
<td>A</td>
</tr>
<tr>
<td>&gt;70%</td>
<td>B</td>
</tr>
<tr>
<td>&gt;55%</td>
<td>C</td>
</tr>
<tr>
<td>&gt;40%</td>
<td>D</td>
</tr>
<tr>
<td>&lt;40%</td>
<td>F</td>
</tr>
</tbody>
</table>

V. Texts

1. Laboratory Safety for Chemistry Students, by Robert H. Hill and David Finster, Wiley

Note: Instructor reserves the right to change the required text books for better learning experience of the students.

Recommended: Calculator with scientific notation.
VI. Calendar

Tentative Dates for homework, lab reports, presentations and lab test

1: TBA
2: TBA
3: TBA
4: TBA

Comprehensive final presentation: According to University Final Exam Schedule. PLEASE Don’t make any travel plans that conflicts with your Exam Schedule.

Please note that the examination topics to be covered are approximate only. The materials covered in each examination will be announced in the lecture class.

The purpose of each examination is to evaluate the understanding of the course material, as opposed to mere memorization. This means that the student will ultimately be expected to utilize basic principles in the solution of new problem situations.

VII. Academic Misconduct

You will be allowed to use a non-programmable calculator during the quizzes and examinations in this course. No other help is allowed. Use of other materials, information or persons during a quiz or exam will be viewed as cheating. In other words, collaborative efforts to answer quiz or exam questions are strictly forbidden, and your answers to quiz or exam questions must be the result of strictly individual efforts. Evidence of cheating as defined above will result in a grade of zero for that quiz or exam for the first offense, even if the cheating activity involves only one question. In the second instance of such activity, the instructor will proceed with formal charges against the student, to effect, at least a failing grade in the course. Please consult the policy on Student Academic Dishonesty on in the University Catalog (2013-2014).

VIII. Disclaimer: Instructor reserves the right to revise the content of the syllabus as needed throughout the semester for better learning experience of the students.
Request for New Course Template
(Undergraduate Course Numbers through Course Number 699)

Department: Chemistry College: College of Arts and Sciences

Date of Submission to the Department: 08/12/2013
Contact Person: Dr. Dilip Paul □ Faculty member □ Chair

Title of Course: Physical properties of polymers Credit Hours: 3

Course Number: CHEM 680 Hegis Number: ______

Date first offered: 2014
(Semester/Year)

To be Offered: □ Fall □ Spring □ Summer Estimated Enrollment: 20
(check all that apply)

Prerequisite(s): CHEM 360 and CHEM 625 or permission of instructor

This course is: □ Required □ Elective

If this course is "required," which major(s) will require it? Polymer Chemistry

Course Description: Physical chemistry of polymers, various physical states of polymers, molecular weight determination, polymers in solutions and viscosity, Flory-Huggins theory, thermodynamics of polymer in solutions, kinetics and morphology of polymers, structure-property correlation, methods of polymer characterization
(as it will appear in the catalog)

Purpose/Justification for Course: Introduction to the physical properties of polymers, thermodynamics and kinetics aspects of polymers, different techniques of characterizations

Objectives/Student Learning Outcomes:
This course will introduce physical properties of polymers, polymers in solution. This course will help learning various physical properties, kinetics and their characterizations

Assessment Strategies (e.g. exams, projects, university rubrics, etc.):
Quizzes, written tests, and final examinations

PLEASE ATTACH SYLLABUS

Additional Resources Required (e.g. library or multimedia resources, technology, space, major expense, etc.):
Library

Will any additional student fees be required (e.g. equipment, clothing, travel, licensing, etc.)? □ Yes □ No

If "yes," please realize that it will need to gain approval of the President's Council.
Rationale: _____
Is this course to be considered for General Education?  □ Yes  X  No

If “yes,” please indicate the University’s General Education Goals met by this course AND the assessment data that will be collected to measure these goals:

______________________________

Please realize that it will need to gain approval of the General Education Committee.

Will this course be required of any education majors?  □ Yes  X  No

If “yes,” please realize that it will need to have the approval of the Teacher Education Council.

Will this course be submitted for Departmental Academic Honors?  □ Yes  X  No

If “yes,” please realize that it will need to have the approval of the Faculty Senate Departmental Academic Honors Committee.

What additional costs will be required for this course (e.g. staffing, equipment, etc.)? Costs are covered by the polymer initiative.

Will this course impact any other department/college/unit’s curricula or programs?  □ Yes  X  No

If “yes,” have relevant discussions occurred?  □ Yes  □ No

Documentation of these discussions (e.g. copies of e-mails, memos, etc.) is required to be attached.

Originating Department: Please complete this form and upload, with syllabus, to the Zimbra Briefcase, “Undergraduate Curriculum Legislation” (within the appropriate College folder, “Preliminary Legislation”), to allow for review and questions. Any modifications should be saved as “original file name.version2.docx” (e.g. MATH 343.version 2.docx) and uploaded as well.

Please print the final version of this form, apply the appropriate signature, and forward to the Office of the Registrar.
PITTSBURG STATE UNIVERSITY

LEGISLATIVE PROCESS
AUTHORIZATION/NOTIFICATION SIGN-OFF SHEET

Signatures:

☐ Approved: Department Chairperson
   Date 7/2/2012 Signature, Department Chairperson
   [Signature]

☐ Approved: College Curriculum Committee
   Date 7/7/15 Signature, College Curriculum Committee Chair
   K TF

☐ Approved: Dean of College
   Date 7/4/15 Signature, Dean
   K TF

☐ Approved: General Education Committee (if applicable)
   Date ______ Signature, General Education Committee Chair
   [Signature]

☐ Approved: Teacher Education Council (if applicable)
   Date ______ Signature, Teacher Education Council Chair
   [Signature]

☐ Approved: Faculty Senate University Undergraduate Curriculum Committee
   Date 11/13/13 Signature, Undergraduate Curriculum Committee Chair
   [Signature]

☐ Approved: Faculty Senate
   Date ______ Signature, Recording Secretary, Faculty Senate
   [Signature]

Please Note
This is a two-to-three-month process, at least, and is designed to eliminate questions and concerns at the beginning of the process. Any questions/concerns not addressed prior to the review by the College Curriculum Committee and the Faculty Senate Undergraduate Curriculum Committee may result in an additional month added to the process.
Attach syllabus here:
Please see attached file.
COURSE DESCRIPTION

CHME 680: Physical properties of polymers (3 hrs)

Physical chemistry of polymers, various physical states of polymers, molecular weight
determination, polymers in solutions and viscosity, Flory-Huggins theory, thermodynamics of
polymer in solutions, kinetics and morphology of polymers, structure-property correlation,
methods of polymer characterization

Prerequisite/corequisite: CHEM 360 and CHEM 625 or permission of instructor

Purpose/Justification for course: Introduction to the physical properties of polymers,
thermodynamics and kinetics aspects of polymers, different techniques of characterizations

Objectives/Student Learning Outcomes: This course will introduce physical properties of
polymers, polymers in solution. This course will help learning various physical properties,
kinetics and their characterizations.

Assessment Strategies: Quizzes, written tests, and final examination
Course Syllabus

CHEM 680: Physical properties of polymers

Instructor: CHEM/PET Faculty
Email: TBD
Phone No.: TBD

Office: TBD
Lecture room: TBD
Office Hours: TBD

I. Descriptive Information

A. Course Number: CHEM 680

B. Course Title and Credits: Physical properties of polymers (3 hrs)

C. Description of the Course: Physical chemistry of polymers, various physical states of polymers, molecular weight determination, polymers in solutions and viscosity, Flory-Huggins theory, thermodynamics of polymer in solutions, kinetics and morphology of polymers, structure-property correlation, methods of polymer characterization

1. Physical states of polymer
2. Polymers structures, chain dimension, and morphology
3. Thermodynamics of polymer solutions
4. Non-ideal polymer solutions
5. Flory-Huggins theory: entropy of mixing
6. Rheology and mechanical properties of polymers
7. Colligative properties of polymer solutions
8. Ionic liquids
9. Structure–property correlations
10. Viscosity, molecular weight determination
11. Glass state and glass transition temperature of polymers
12. Various physical method of characterizations
D. Required Text:


Note: Instructor reserves the right to change the required text books for better learning experience of the students.

E. Prerequisites: CHEM 360 and CHEM 625 or permission of instructor

II. Course Objectives

The Course is designed to:

1. introduce physical properties of polymers
2. introduce the concepts of polymers in solutions: thermodynamic and kinetics
3. introduce the concept of rheology and mechanical properties of polymers
4. introduce structure-property correlations
5. introduce morphology of polymers and characterization
6. introduce kinetics of crystallization and glass transition states
7. Introduce various physical characterization methods

III. Course Requirements

A. Participation in the course work:

Regular participation is very important for the successful completion of the course work. It is your responsibility to attend classes regularly and keep up to date with the lecture material so that you do not fall behind. As is true with most sciences, polymer chemistry is a structured subject. This means that an understanding of the course material will depend heavily upon an understanding of preceding material. Also please keep in mind that mere memorization of the facts without understanding the subject matter is almost certain to result in a poor performance in the course. In fact, the goal of each quiz and exam will be to evaluate understanding of the course material as opposed to mere memorization. This means that you will ultimately be expected to utilize the basic principles taught in this course in the solution of new problem situations.
There will be no “extra credit” work in this course.

B. Homework:

A series of exercises are given at the end of each chapter in your text. You will be responsible for learning to solve these problems. This helps you to understand critically the subject matter of the chapter. On the other hand, the quizzes, tests, and even final examinations will resemble these one or more of the exercises that are assigned below. You should therefore view learning how to do these exercises as a high priority. Learning how to do these exercises at the end of each chapter that have not been assigned should also prove helpful.

IV. Evaluation of Performance

Your grade in this course will be determined by a series tests, a series of quizzes, and a comprehensive final examination. Each test will be weighted at 15% of your grade. The final exam will be comprehensive in nature, will be worth 15% of your grade.

The quizzes will be given during the class period (either at the beginning or at the end) and will cover exercises from the text that were assigned as homework and topics covered in the class. No makeup examinations or quizzes will be given unless prior permission was taken for absences.

Four tests: 60 points
Four quizzes: 10 points
Homework: 10 points
Comprehensive Final: 15 points
Regular Participation: 5 points

Total = 100 points

Your overall letter grade for the course will be determined using the following scale:

<table>
<thead>
<tr>
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<td>&gt; 85%</td>
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</tr>
<tr>
<td>&gt;55%</td>
<td>C</td>
</tr>
</tbody>
</table>
V. Texts


Note: Instructor reserves the right to change the required text books for better learning experience of the students.

Recommended: Calculator with scientific notation.

VI. Calendar

Tentative Quiz Topics and Dates

Quiz 1: TBA
Quiz 2: TBA
Quiz 3: TBA
Quiz 4: TBA

Tentative Examination Topics and Dates

Exam 1: TBA
Exam 2: TBA
Exam 3: TBA
Exam 4: TBA

Comprehensive Final Examination: According to University Final Exam Schedule. PLEASE Don’t make any travel plans that conflicts with your Exam Schedule.
Please note that the examination topics to be covered are approximate only. The materials covered in each examination will be announced in the lecture class.

The purpose of each exam. is to evaluate the understanding of the course material, as opposed to mere memorization. This means that the student will ultimately be expected to utilize basic principles in the solution of new problem situations.

VII. Academic Misconduct

You will be allowed to use a non-programmable calculator during the quizzes and examinations in this course. No other help is allowed. Use of other materials, information or persons during a quiz or exam will be viewed as cheating. In other words, collaborative efforts to answer quiz or exam questions are strictly forbidden, and your answers to quiz or exam questions must be the result of strictly individual efforts. Evidence of cheating as defined above will result in a grade of zero for that quiz or exam for the first offense, even if the cheating activity involves only one question. In the second instance of such activity, the instructor will proceed with formal charges against the student, to effect, at least a failing grade in the course. Please consult the policy on Student Academic Dishonesty on in the University Catalog (2013-2014).

VIII. Disclaimer: Instructor reserves the right to revise the content of the syllabus as needed throughout the semester for better learning experience of the students.
Request for New Course Template
(Undergraduate Course Numbers through Course Number 699)

Department: Chemistry College: College of Arts and Sciences

Date of Submission to the Department: 08/12/2013

Contact Person: Dr. Dilip Paul □ Faculty member □ Chair

Title of Course: Polymer chemistry colloquium Credit Hours: 1

Course Number: CHEM 681 Hegis Number: ___

Date first offered: 2014 Estimated Enrollment: 20
(Semester/Year)

To be Offered: □ Fall □ Spring □ Summer (check all that apply)

Prerequisite(s): CHEM 325 or CHEM 360 or permission of instructor

This course is: □ Required □ Elective

If this course is “required,” which major(s) will require it? Polymer Chemistry

Course Description: Oral presentation and discussion on selected research topics in polymer science, published peer reviewed journals, review of selected topics in polymer chemistry (as it will appear in the catalog)

Purpose/Justification for Course: to enhance the quality of presentation and communication skills, to update the advancement of polymer science

Objectives/Student Learning Outcomes:
Students will learn techniques of oral presentation and enhance their communication skills

Assessment Strategies (e.g. exams, projects, university rubrics, etc.):
Presentation and communication skills judged by audience through question and answer

PLEASE ATTACH SYLLABUS

Additional Resources Required (e.g. library or multimedia resources, technology, space, major expense, etc.):
Library

Will any additional student fees be required (e.g. equipment, clothing, travel, licensing, etc.)? □ Yes □ No

If “yes,” please realize that it will need to gain approval of the President’s Council.

Rationale: ___
Is this course to be considered for General Education? Yes ☐ No ☒

If “yes,” please indicate the University’s General Education Goals met by this course AND the assessment data that will be collected to measure these goals:

Please realize that it will need to gain approval of the General Education Committee.

Will this course be required of any education majors? Yes ☐ No ☒

If “yes,” please realize that it will need to have the approval of the Teacher Education Council.

Will this course be submitted for Departmental Academic Honors? Yes ☐ No ☒

If “yes,” please realize that it will need to have the approval of the Faculty Senate Departmental Academic Honors Committee.

What additional costs will be required for this course (e.g. staffing, equipment, etc.)? Costs are covered by the polymer initiative.

Will this course impact any other department/college/unit’s curricula or programs? Yes ☐ No ☒

If “yes,” have relevant discussions occurred? Yes ☐ No ☐

Documentation of these discussions (e.g. copies of e-mails, memos, etc.) is required to be attached.

Originating Department: Please complete this form and upload, with syllabus, to the Zimbra Briefcase, “Undergraduate Curriculum Legislation” (within the appropriate College folder, “Preliminary Legislation”), to allow for review and questions. Any modifications should be saved as “original file name.version2.docx” (e.g. MATH 343.version 2.docx) and uploaded as well.

Please print the final version of this form, apply the appropriate signature, and forward to the Office of the Registrar.
PITTSBURG STATE UNIVERSITY

LEGISLATIVE PROCESS
AUTHORIZATION/NOTIFICATION SIGN-OFF SHEET

Signatures:

☒ Approved: Department Chairperson
Date 9/3/2012 Signature, Department Chairperson

☒ Approved: College Curriculum Committee
Date 10/7/13 Signature, College Curriculum Committee Chair

☒ Approved: Dean of College
Date 11/11/13 Signature, Dean

☐ Approved: General Education Committee (if applicable)
Date ______ Signature, General Education Committee Chair

☐ Approved: Teacher Education Council (if applicable)
Date ______ Signature, Teacher Education Council Chair

☐ Approved: Faculty Senate University Undergraduate Curriculum Committee
Date 11/11/13 Signature, Undergraduate Curriculum Committee Chair

☐ Approved: Faculty Senate
Date ______ Signature, Recording Secretary, Faculty Senate

Please Note
This is a two-to-three-month process, at least, and is designed to eliminate questions and concerns at the beginning of the process. Any questions/concerns not addressed prior to the review by the College Curriculum Committee and the Faculty Senate Undergraduate Curriculum Committee may result in an additional month added to the process.
Attach syllabus here:
Please see attached file.
COURSE DESCRIPTION

CHEM 681: Polymer chemistry colloquium (1 hr)

Oral presentation and discussion on selected research topics in polymer science, published peer reviewed journals, review of selected topics in polymer chemistry

Prerequisite/corequisite: CHEM 325 or CHEM 360 or permission of instructor

Purpose/Justification for course: to enhance the quality of presentation and communication skills, to update the advancement of polymer science

Objectives/Student Learning Outcomes: Students will learn techniques of oral presentation and enhance their communication skills

Assessment Strategies: Presentation and communication skills judged by audience through question and answer
Course Syllabus

CHEM 681: Polymer chemistry colloquium

Instructor: CHEM/PET Faculty
Email: TBD
Phone No.: TBD

Office: TBD
Lecture room: TBD
Office Hours: TBD

I. Descriptive Information

A. Course Number: CHEM 681

B. Course Title and Credits: Polymer chemistry colloquium (1 credit)

C. Description of the Course: Oral presentation and discussion on selected research topics in polymer science, published peer reviewed journals, review of selected topics in polymer chemistry

D. Required Text:

1. Peer-reviewed journal articles selected by instructors

Note: Instructor reserves the right to change the required journals/topics for better learning experience of the students.

E. Prerequisites: CHEM 325 or CHEM 360 or permission of instructor

II. Colloquium Objectives

The colloquium is designed to:

1. Update the literature on the polymer science
2. Enhance oral presentation skills
3. Introduce the skills of addressing questions from the audience
4. Train how to prepare power point presentation
III. Course Requirements

A. Participation in the seminar hall:

Regular participation is very important for the successful completion of the colloquium credit hour. It is student’s responsibility to attend the colloquium regularly.

*There will be no “extra credit” work in this course.*

B. Homework:

A series of literature will be given during the courses. You will be responsible to learn the topics. This helps you to understand critically how to perform better quality presentation on time.

IV. Evaluation of Performance

Presentation and communication skills judged by audience through question and answer.

V. Texts

1. Peer-reviewed journal articles selected by instructors

*Note:* Instructor reserves the right to change the required text books for better learning experience of the students.

VI. Calendar

*Tentative Dates for presentation*

1: TBA
2: TBA
3: TBA
4: TBA

*Please note that the examination topics to be covered are approximate only. The materials covered in each examination will be announced in the lecture class.*
The purpose of each examination is to evaluate the understanding of the course material, as opposed to mere memorization. This means that the student will ultimately be expected to utilize basic principles in the solution of new problem situations.

VII. Academic Misconduct

You will be allowed to use a non-programmable calculator during the quizzes and examinations in this course. No other help is allowed. Use of other materials, information or persons during a quiz or exam will be viewed as cheating. In other words, collaborative efforts to answer quiz or exam questions are strictly forbidden, and your answers to quiz or exam questions must be the result of strictly individual efforts. Evidence of cheating as defined above will result in a grade of zero for that quiz or exam for the first offense, even if the cheating activity involves only one question. In the second instance of such activity, the instructor will proceed with formal charges against the student, to effect, at least a failing grade in the course. Please consult the policy on Student Academic Dishonesty on in the University Catalog (2013-2014).

VIII. Disclaimer: Instructor reserves the right to revise the content of the syllabus as needed throughout the semester for better learning experience of the students.
Request for New Course Template
(Undergraduate Course Numbers through Course Number 699)

Department: Chemistry  College: College of Arts and Sciences
Date of Submission to the Department: 08/12/2013
Contact Person: Dr. Dilip Paul  Faculty member  Chair

Title of Course: Biopolymers  Credit Hours: 3

Course Number: CHEM 683  Hegis Number: ___

Date first offered: 2014  Estimated Enrollment: 20
(Semester/Year)

To be Offered:  Fall  Spring  Summer  (check all that apply)

Prerequisite(s): CHEM 320, CHEM 326, and CHEM 360 or permission of instructor

This course is:  Required  Elective

If this course is "required," which major(s) will require it? Polymer Chemistry

Course Description: Structure, function, and physical properties of naturally-occuring polymers, including proteins, polysaccharides, polyesters, DNA and lipids. The concept of nature as a model for polymeric materials is discussed. The transformation of natural and synthetic starting materials to bio-based synthetic polymers, biodegradable polymers and other bio-based products is presented. Degradation mechanisms in polymeric materials, environmental issues when using biopolymers and synthetic polymers, and various routes for recovery/reuse of plastics is reviewed. An introduction to polymers used in biomedical and other biological systems is conducted.
(as it will appear in the catalog)

Purpose/Justification for Course: Introduction to the concepts of natural, bio-based and biodegradable polymeric materials and their applications.

Objectives/Student Learning Outcomes:
Students will gain an understanding of naturally occurring polymers, bio-based synthetic polymers, biodegradable polymers and polymers used in biological applications.

Assessment Strategies (e.g. exams, projects, university rubrics, etc.):
Quizzes, written homework assignments, written tests, group written and oral presentation and final examination.

PLEASE ATTACH SYLLABUS

Additional Resources Required (e.g. library or multimedia resources, technology, space, major expense, etc.):
Library
Will any additional student fees be required (e.g. equipment, clothing, travel, licensing, etc.)?  □ Yes  ☒ No

If "yes," please realize that it will need to gain approval of the President’s Council.

Rationale: ______
Is this course to be considered for General Education? ☐ Yes ☐ No

If "yes," please indicate the University's General Education Goals met by this course AND the assessment data that will be collected to measure these goals:


Please realize that it will need to gain approval of the General Education Committee.

Will this course be required of any education majors? ☐ Yes ☐ No

If "yes," please realize that it will need to have the approval of the Teacher Education Council.

Will this course be submitted for Departmental Academic Honors? ☐ Yes ☐ No

If "yes," please realize that it will need to have the approval of the Faculty Senate Departmental Academic Honors Committee.

What additional costs will be required for this course (e.g. staffing, equipment, etc.)? Nothing anticipated. The polymer initiative funds has a budget line for instructional equipment if needs arise.

Will this course impact any other department/college/unit's curricula or programs? ☐ Yes ☐ No

If "yes," have relevant discussions occurred? ☐ Yes ☐ No

Documentation of these discussions (e.g. copies of e-mails, memos, etc.) is required to be attached.

Originating Department: Please complete this form and upload, with syllabus, to the Zimbra Briefcase, "Undergraduate Curriculum Legislation" (within the appropriate College folder, "Preliminary Legislation"), to allow for review and questions. Any modifications should be saved as "original file name.version2.docx" (e.g. MATH 343.version 2.docx) and uploaded as well.

Please print the final version of this form, apply the appropriate signature, and forward to the Office of the Registrar.
PITTSBURG STATE UNIVERSITY

LEGISLATIVE PROCESS
AUTHORIZATION/NOTIFICATION SIGN-OFF SHEET

Signatures:

☑ Approved: Department Chairperson
   Date 9/13/2012 Signature, Department Chairperson
   [Signature]

☑ Approved: College Curriculum Committee
   Date 10/7/13 Signature, College Curriculum Committee Chair
   [Signature]

☑ Approved: Dean of College
   Date 11/13/13 Signature, Dean
   [Signature]

☐ Approved: General Education Committee (if applicable)
   Date ______ Signature, General Education Committee Chair
   [Signature]

☐ Approved: Teacher Education Council (if applicable)
   Date ______ Signature, Teacher Education Council Chair
   [Signature]

☐ Approved: Faculty Senate University Undergraduate Curriculum Committee
   Date 11/13/13 Signature, Undergraduate Curriculum Committee Chair
   [Signature]

☐ Approved: Faculty Senate
   Date ______ Signature, Recording Secretary, Faculty Senate
   [Signature]

Please Note
This is a two-to-three-month process, at least, and is designed to eliminate questions and concerns at the beginning of the process. Any questions/concerns not addressed prior to the review by the College Curriculum Committee and the Faculty Senate Undergraduate Curriculum Committee may result in an additional month added to the process.
Attach syllabus here:
Please see attached file.
COURSE DESCRIPTION

CHEM 683: Biopolymers (3 hrs)

Structure, function, and physical properties of naturally-occurring polymers, including proteins, polysaccharides, polyesters, DNA and lipids. The concept of nature as a model for polymeric materials is discussed. The transformation of natural and synthetic starting materials to bio-based synthetic polymers, biodegradable polymers and other bio-based products is presented. Degradation mechanisms in polymeric materials, environmental issues when using biopolymers and synthetic polymers, and various routes for recovery/reuse of plastics is reviewed. An introduction to polymers used in biomedical and other biological systems is conducted.

Prerequisite: CHEM 320 Introductory Organic Chemistry and CHEM 326 Organic Chemistry Laboratory. CHEM 360 Introduction to polymer science and technology, or permission of instructor.
Corequisite: None

Purpose/justification for course: Introduction to the concepts of natural, bio-based and biodegradable polymeric materials and their applications.

Objectives/Student Learning Outcomes: Students will gain an understanding of naturally occurring polymers, bio-based synthetic polymers, biodegradable polymers and polymers used in biological applications.

Assessment Strategies: Quizzes, written homework assignments, written tests, group written and oral presentation and final examination.
Course Syllabus

CHEM 683: Biopolymers

Instructor: CHEM/PET Faculty  Office: TBD
Email: TBD  Lecture room: TBD
Phone No.: TBD  Office Hours: TBD

I. Descriptive Information
   A. Course Number: CHEM 683
   B. Course Title and Credits: Biopolymers (3 credits)
   C. Description of the Course:
      Structure, function, and physical properties of naturally-occurring polymers, including proteins, polysaccharides, polyesters, DNA and lipids. The concept of nature as a model for polymeric materials is discussed. The transformation of natural and synthetic starting materials to bio-based synthetic polymers, biodegradable polymers and other bio-based products is presented. Degradation mechanisms in polymeric materials, environmental issues when using biopolymers and synthetic polymers, and various routes for recovery/reuse of plastics is reviewed. An introduction to polymers used in biomedical and other biological systems is conducted.

      1) Differences between natural polymers, bio-based polymers and biodegradable polymers.
      2) Structure/properties relationships of naturally-occurring polymers (at atomic, nano-, micro- and macro-level)
      3) The choice of natural and synthetic starting materials for polymers suitable for common applications with respect to raw materials, material properties, and application.
      4) The material properties and environmental effects of biodegradation and the impact of recovery/reuse of plastics.
      5) Polymeric material choices for biomedical and other biological applications.

D. Required Text:
   3) Research journals

   Note: Instructor reserves the right to change the required text books for an improved learning experience of the students.

E. Prerequisites: CHEM 320 Introductory Organic Chemistry and CHEM 326 Organic Chemistry Laboratory, CHEM 360 Introduction to polymer science and technology, or permission of instructor.
II. Course Objectives

The lecture course is designed to:

1) Present the differences between natural polymers, bio-based polymers and biodegradable polymers.
2) Explain and evaluate the structure/properties relationships of naturally-occurring polymers (at atomic, nano-, micro- and macro-level)
3) Discuss the choice of natural and synthetic starting materials for polymers suitable for common applications with respect to raw materials, energy aspects, material properties, function and environmental impact.
4) Describe the process and explain the material properties and environmental effects of biodegradation the impact of recovery/reuse of plastics.
5) Reflect on the polymeric material choices for biomedical and other biological applications.

III. Course Requirements

A. Attendance and Participation:

Attendance will be taken during each lecture. Attendance is considered in evaluating performance in the work place and will be considered when assigning final grades in this class. Students must notify the instructor BEFORE a lecture to be excused from a lecture. Active participation in class discussions will also be considered in this class when assigning final grades.

B. Homework:

A series of written homework assignment will be given throughout the courses. You will be responsible for completing the assignments and turning them in by the specified due date. Late work is not accepted without prior arrangement.

C. Quizzes:

Quizzes will be given at regular intervals between exams to assess student progress and identify areas where performance improvement is necessary. Quizzes cannot be made up. Students must attend the lecture period in which the quiz is given.

D. Final written and oral group project:

Students will be divided into small groups (3-4 students) and will be responsible for preparing a written report and a short oral presentation with accompanying visual aids on a current relevant topic in the course subject area. Final projects topic will be assigned at the discretion of the instructor. Report documents and presentation visual aids are due at the designated time of the oral presentation. Late work is not accepted.

E. Exams:

Exams will be given to evaluate the student's understanding of the course topics. Regular exams will be given during the semester. Exams cover material presented in the period between exams, with the exception of the comprehensive final exam. Exams will be closed book, closed notes and closed homework. Rescheduling exams will only be done under special circumstances and only by notifying the instructor prior to the scheduled exam. The final exam is scheduled according to the final exam schedule set by the PSU registrar and cannot be changed or rescheduled.
IV. Evaluation of Performance

Your grade in this course will be determined by a series of quizzes, written homework assignments, written tests, a group written and oral presentation regular exams and a final examination. Unless an absence is excused, late work is not accepted.

The division of the percentage grade and percentages for letter grades are given below:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>90 - 100</td>
<td>A</td>
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<tr>
<td>80 - 89</td>
<td>B</td>
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<tr>
<td>70 - 79</td>
<td>C</td>
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<tr>
<td>60 - 69</td>
<td>D</td>
</tr>
<tr>
<td>59 - 0</td>
<td>F</td>
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<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

V. Texts


3) Research journals

Note: Instructor reserves the right to change the required text books for an improved learning experience of the students.

Recommended: Calculator with scientific notation.

VI. Calendar

Tentative Dates for homework, lab reports, presentations and lab test

1: TBA
2: TBA
3: TBA
4: TBA

Comprehensive final presentation: According to University Final Exam Schedule. PLEASE Don’t make any travel plans that conflicts with your Exam Schedule.

Please note that the examination topics to be covered are approximate only. The materials covered in each examination will be announced in the lecture class.

The purpose of each examination is to evaluate the understanding of the course material, as opposed to mere memorization. This means that the student will ultimately be expected to utilize basic principles in the solution of new problem situations.
VII. Academic Misconduct

You will be allowed to use a non-programmable calculator during the quizzes and examinations in this course. No other help is allowed. Use of other materials, information or persons during a quiz or exam will be viewed as cheating. In other words, collaborative efforts to answer quiz or exam questions are strictly forbidden, and your answers to quiz or exam questions must be the result of strictly individual efforts. Evidence of cheating as defined above will result in a grade of zero for that quiz or exam for the first offense, even if the cheating activity involves only one question. In the second instance of such activity, the instructor will proceed with formal charges against the student, to effect, at least a failing grade in the course.

Please consult the policy on Student Academic Dishonesty on in the University Catalog (2013-2014).

VIII. Disclaimer: Instructor reserves the right to revise the content of the syllabus as needed throughout the semester for better learning experience of the students.
Request for New Course Template
(Undergraduate Course Numbers through Course Number 699)

Department: Chemistry College: College of Arts and Sciences

Date of Submission to the Department: 08/12/2013

Contact Person: Dr. Dilip Paul ☐ Faculty member ☑ Chair

Title of Course: Selected topics in polymer chemistry Credit Hours: 1 - 3

Course Number: CHEM 685 Hegis Number: ____

Date first offered: 2014 (Semester/Year)

To be Offered: ☑ Fall ☑ Spring ☑ Summer Estimated Enrollment: 20

(check all that apply)

Prerequisite(s): CHEM 325 or CHEM 360 or permission of instructor

This course is: ☐ Required ☑ Elective

If this course is “required,” which major(s) will require it? Polymer Chemistry

Course Description: Variable topic course providing focus on selected topics in polymer chemistry or concepts of special polymers. This course can be repeated when the topic changes.
(as it will appear in the catalog)

Purpose/Justification for Course: Introduction to special polymers, synthesis, and their applications in various fields of polymer chemistry. The variable topic course provides students the opportunity to take courses dealing with various issues and materials in polymer science when faculty choose to offer these unique experiences.

Objectives/Student Learning Outcomes:
Specific objectives and student learning outcomes will vary by the topic being taught and the course instructor.

Assessment Strategies (e.g. exams, projects, university rubrics, etc.):
Student assessment will vary by the topic being taught and the course instructor.

PLEASE ATTACH SYLLABUS

Additional Resources Required (e.g. library or multimedia resources, technology, space, major expense, etc.): Library

Will any additional student fees be required (e.g. equipment, clothing, travel, licensing, etc.)? ☐ Yes ☑ No

If “yes,” please realize that it will need to gain approval of the President’s Council.
Is this course to be considered for General Education? □ Yes  ☑ No

If “yes,” please indicate the University’s General Education Goals met by this course AND the assessment data that will be collected to measure these goals:

Please realize that it will need to gain approval of the General Education Committee.

Will this course be required of any education majors? □ Yes  ☑ No

If “yes,” please realize that it will need to have the approval of the Teacher Education Council.

Will this course be submitted for Departmental Academic Honors? □ Yes  ☑ No

If “yes,” please realize that it will need to have the approval of the Faculty Senate Departmental Academic Honors Committee.

What additional costs will be required for this course (e.g. staffing, equipment, etc.) ? **None.**

Will this course impact any other department/college/unit’s curricula or programs? □ Yes  ☑ No

If “yes,” have relevant discussions occurred? □ Yes  □ No

Documentation of these discussions (e.g. copies of e-mails, memos, etc.) is required to be attached.

Originating Department: Please complete this form and upload, with syllabus, to the Zimbra Briefcase, “Undergraduate Curriculum Legislation” (within the appropriate College folder, “Preliminary Legislation”), to allow for review and questions. Any modifications should be saved as “original file name.version2.docx” (e.g. MATH 343.version 2.docx) and uploaded as well.

Please print the final version of this form, apply the appropriate signature, and forward to the Office of the Registrar.
PITTSBURG STATE UNIVERSITY

LEGISLATIVE PROCESS
AUTHORIZATION/NOTIFICATION SIGN-OFF SHEET

Signatures:

☑ Approved: Department Chairperson
  Date 9/3/2012 Signature, Department Chairperson

☑ Approved: College Curriculum Committee
  Date 9/11/13 Signature, College Curriculum Committee Chair

☑ Approved: Dean of College
  Date 9/14/13 Signature, Dean

☐ Approved: General Education Committee (if applicable)
  Date ______ Signature, General Education Committee Chair

☐ Approved: Teacher Education Council (if applicable)
  Date ______ Signature, Teacher Education Council Chair

☐ Approved: Faculty Senate University Undergraduate Curriculum Committee
  Date 11/13/13 Signature, Undergraduate Curriculum Committee Chair

☐ Approved: Faculty Senate
  Date ______ Signature, Recording Secretary, Faculty Senate

Please Note
This is a two-to-three-month process, at least, and is designed to eliminate questions and concerns at the beginning of the process. Any questions/concerns not addressed prior to the review by the College Curriculum Committee and the Faculty Senate Undergraduate Curriculum Committee may result in an additional month added to the process.
Attach syllabus here:
Not applicable since we are proposing a variable topic, variable credit course. The syllabus will vary according to the topic, number of offered credit hours, and the instructor in a given section.
Request for New Course Template
(Undergraduate Course Numbers through Course Number 699)

Department: Chemistry  College: College of Arts and Sciences

Date of Submission to the Department: 08/28/2013

Contact Person: Dr. Dilip Paul  ☐ Faculty member ☑ Chair

Title of Course: Polymers in Nanotechnology  Credit Hours: 3

Course Number: CHEM 687  Hegis Number: _____

Date first offered: 2014
(Semester/Year)

To be Offered: ☑ Fall  ☑ Spring  ☐ Summer
(check all that apply)  Estimated Enrollment: 20

Prerequisite(s): CHEM 620 or permission of instructor

This course is: ☐ Required  ☑ Elective

If this course is “required,” which major(s) will require it? Polymer Chemistry

Course Description: Introduction to nanotechnology, importance of polymer science in nanotechnology, biodegradable and biocompatible polymers, polymeric nanotherapeutics for targeted drug delivery, nanotheranostics, nanotoxicology, and nanobi imaging.
(as it will appear in the catalog)

Purpose/Justification for Course: Introduction to the basic concepts of nanobiotechnology and role of biopolymers in this field of nanomedicine.

Objectives/Student Learning Outcomes:
This course will introduce the concept of nanotechnology, nanobi imaging, and the role of polymers in nanomedicine.

Assessment Strategies (e.g. exams, projects, university rubrics, etc.):
Quizzes, written tests, and final examinations

PLEASE ATTACH SYLLABUS

Additional Resources Required (e.g. library or multimedia resources, technology, space, major expense, etc.):
Library

Will any additional student fees be required (e.g. equipment, clothing, travel, licensing, etc.)? ☐ Yes  ☑ No

If “yes,” please realize that it will need to gain approval of the President’s Council.
Is this course to be considered for General Education? □ Yes □ No

If “yes,” please indicate the University’s General Education Goals met by this course AND the assessment data that will be collected to measure these goals:

Please realize that it will need to gain approval of the General Education Committee.

Will this course be required of any education majors? □ Yes □ No

If “yes,” please realize that it will need to have the approval of the Teacher Education Council.

Will this course be submitted for Departmental Academic Honors? □ Yes □ No

If “yes,” please realize that it will need to have the approval of the Faculty Senate Departmental Academic Honors Committee.

What additional costs will be required for this course (e.g. staffing, equipment, etc.)? Costs are covered by the polymer initiative

Will this course impact any other department/college/unit’s curricula or programs? □ Yes □ No

If “yes,” have relevant discussions occurred? □ Yes □ No

Documentation of these discussions (e.g. copies of e-mails, memos, etc.) is required to be attached.

Originating Department: Please complete this form and upload, with syllabus, to the Zimbra Briefcase, “Undergraduate Curriculum Legislation” (within the appropriate College folder, “Preliminary Legislation”), to allow for review and questions. Any modifications should be saved as “original file name.version2.docx” (e.g. MATH 343.version 2.docx) and uploaded as well.

Please print the final version of this form, apply the appropriate signature, and forward to the Office of the Registrar.
PITTSBURG STATE UNIVERSITY

LEGISLATIVE PROCESS
AUTHORIZATION/NOTIFICATION SIGN-OFF SHEET

Signatures:

☑ Approved: Department Chairperson
  Date 9/3/2013 Signature, Department Chairperson

☑ Approved: College Curriculum Committee
  Date 10/7/13 Signature, College Curriculum Committee Chair

☑ Approved: Dean of College
  Date 9/14/13 Signature, Dean

☐ Approved: General Education Committee (if applicable)
  Date ______ Signature, General Education Committee Chair

☐ Approved: Teacher Education Council (if applicable)
  Date ______ Signature, Teacher Education Council Chair

☐ Approved: Faculty Senate University Undergraduate Curriculum Committee
  Date 11/7/13 Signature, Undergraduate Curriculum Committee Chair

☐ Approved: Faculty Senate
  Date ______ Signature, Recording Secretary, Faculty Senate

Please Note
This is a two-to-three-month process, at least, and is designed to eliminate questions and concerns at the beginning of the process. Any questions/concerns not addressed prior to the review by the College Curriculum Committee and the Faculty Senate Undergraduate Curriculum Committee may result in an additional month added to the process.
Attach syllabus here:
Please see attached file.
COURSE DESCRIPTION

CHEM 687: Polymers in Nanotechnology (3 hrs)

Introduction to nanotechnology, importance of polymer science in nanotechnology, biodegradable and biocompatible polymers, polymeric nanotherapeutics for targeted drug delivery, nanotheranostics, nanotoxicology, and nanobioimaging.

Prerequisite/corequisite: CHEM 620 or permission of instructor

Purpose/justification for course: Introduction to the basic concepts of nanobiotechnology and role of biopolymers in this field of nanomedicine.

Objectives/Student Learning Outcomes: This course will introduce the concept of nanotechnology, nanobioimaging, and the role of polymers in nanomedicine.

Assessment Strategies: Quizzes, written tests, and final examination
Course Syllabus

CHEM 687: Polymers in Nanotechnology

Instructor: CHEM Faculty  Office: TBD
Email: TBD  Lecture room: TBD
Phone No.: TBD  Office Hours: TBD

I. Descriptive Information

A. Course Number: CHEM 687

B. Course Title and Credits: Polymers in Nanotechnology (3 hrs)

C. Description of the Course: Introduction to nanotechnology, importance of polymer science in nanotechnology, biodegradable and biocompatible polymers, polymeric nanotherapeutics for targeted drug delivery, nanotheranostics, nanotoxicology, and nanobiomaging.

1. Introduction to nanotechnology and nanobiotechnology
2. Importance of polymer science in nanotherapeutics and nanodiagnostics
3. Synthesis of linear and branched biopolymers
4. Fabrication of polymeric nanoparticles to be used as targeted drug delivery system
5. Polymeric nanomedicines for cancer therapy and for the detection of infectious diseases
6. Polymeric materials in nanobiomaging
7. Polymer coated quantum dots in optical imaging
8. Nanotoxicology
9. Dip-pen nanolithography

D. Required Text:

1. Introduction to Nanoscience and Nanotechnology by Gabor L. Hornyak, H.F.
   Tibbals, Joydeep Dutta, John J. Moore, CRC Press.
2. Nanomedicine and Drug Delivery, by Mathew Sebastian; Neethu Ninan; A. K. Haghi,
   CRC Press
Note: Instructor reserves the right to change the required text books for better learning experience of the students.

E. Prerequisites: CHEM 620 or permission of instructor

II. Course Objectives

The Course is designed to:

1. introduce the concept of nanoscience and nanotechnology
2. introduce the basic concepts of polymer science in nanotherapeutics and nanodiagnostics
3. introduce various methodologies to synthesize linear and branched biopolymers
4. fabricate polymeric nanoparticles for targeted drug delivery
5. introduce various polymeric nanomedicines for cancer therapy and for the detection of infectious diseases
6. bring the concept of polymeric materials in nanobioimaging
7. introduce polymer coated quantum dots in optical imaging
8. study the nanotoxicology and dip-pen nanolithography

III. Course Requirements

A. Participation in the course work:

Regular participation is very important for the successful completion of the course work. It is your responsibility to attend classes regularly and keep up to date with the lecture material so that you do not fall behind. As is true with most sciences, polymer chemistry is a structured subject. This means that an understanding of the course material will depend heavily upon an understanding of preceding material. Also please keep in mind that mere memorization of the facts without understanding the subject matter is almost certain to result in a poor performance in the course. In fact, the goal of each quiz and exam will be to evaluate understanding of the course material as opposed to mere memorization. This means that you will ultimately be expected to utilize the basic principles taught in this course in the solution of new problem situations.

There will be no “extra credit” work in this course.
B. Homework:

A series of exercises are given at the end of each chapter in your text. You will be responsible for learning to solve these problems. This helps you to understand critically the subject matter of the chapter. On the other hand, the quizzes, tests, and even final examinations will resemble these one or more of the exercises that are assigned below. You should therefore view learning how to do these exercises as a high priority. Learning how to do these exercises at the end of each chapter that have not been assigned should also prove helpful.

IV. Evaluation of Performance

Your grade in this course will be determined by a series tests, a series of quizzes, and a comprehensive final examination. Each test will be weighted at 15% of your grade. The final exam will be comprehensive in nature, will be worth 15% of your grade.

The quizzes will be given during the class period (either at the beginning or at the end) and will cover exercises from the text that were assigned as homework and topics covered in the class. No makeup examinations or quizzes will be given unless prior permission was taken for absences.

Four tests: 60 points
Four quizzes: 10 points
Homework: 10 points
Comprehensive Final: 15 points
Regular Participation: 5 points

Total = 100 points

Your overall letter grade for the course will be determined using the following scale:

<table>
<thead>
<tr>
<th>Total Score</th>
<th>Letter Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 85%</td>
<td>A</td>
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<tr>
<td>&gt;70%</td>
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<tr>
<td>&gt;55%</td>
<td>C</td>
</tr>
<tr>
<td>&gt;40%</td>
<td>D</td>
</tr>
<tr>
<td>&lt;40%</td>
<td>F</td>
</tr>
</tbody>
</table>
V. Texts


Note: Instructor reserves the right to change the required text books for better learning experience of the students.

Recommended: Calculator with scientific notation.

VI. Calendar

Tentative Quiz Topics and Dates

Quiz 1: TBA
Quiz 2: TBA
Quiz 3: TBA
Quiz 4: TBA

Tentative Examination Topics and Dates

Exam 1: TBA
Exam 2: TBA
Exam 3: TBA
Exam 4: TBA

Comprehensive Final Examination: According to University Final Exam Schedule. PLEASE Don’t make any travel plans that conflicts with your Exam Schedule.

Please note that the examination topics to be covered are approximate only. The materials covered in each examination will be announced in the lecture class.

The purpose of each exam. is to evaluate the understanding of the course material, as opposed to mere memorization. This means that the student will ultimately be expected to utilize basic principles in the solution of new problem situations.
VII. Academic Misconduct

You will be allowed to use a non-programmable calculator during the quizzes and examinations in this course. No other help is allowed. Use of other materials, information or persons during a quiz or exam will be viewed as cheating. In other words, collaborative efforts to answer quiz or exam questions are strictly forbidden, and your answers to quiz or exam questions must be the result of strictly individual efforts. Evidence of cheating as defined above will result in a grade of zero for that quiz or exam for the first offense, even if the cheating activity involves only one question. In the second instance of such activity, the instructor will proceed with formal charges against the student, to effect, at least a failing grade in the course. Please consult the policy on Student Academic Dishonesty on in the University Catalog (2013-2014).

VIII. Disclaimer: Instructor reserves the right to revise the content of the syllabus as needed throughout the semester for better learning experience of the students.
Request for New Course Template
(Undergraduate Course Numbers through Course Number 699)

Department: Chemistry  College: College of Arts and Sciences

Date of Submission to the Department: 08/12/2013

Contact Person: Dr. Dilip Paul  □ Faculty member  □ Chair

Title of Course: Selected research projects in polymer chemistry  Credit Hours: 1 - 3

Course Number: CHEM 690  Hegis Number: _____

Date first offered: 2014
(Semester/Year)

To be Offered:  □ Fall  □ Spring  □ Summer  Estimated Enrollment: 20
(check all that apply)

Prerequisite(s): CHEM 360 or CHEM 625 or permission of instructor

This course is:  □ Required  □ Elective

If this course is “required,” which major(s) will require it? Polymer Chemistry

Course Description: Design and synthesis of selected research projects, analysis of synthetic scheme, characterizations of synthesized polymers, and their applications. (as it will appear in the catalog)

Purpose/Justification for Course: Selected topics of polymer research for advanced applications in polymer science and technology

Objectives/Student Learning Outcomes:
Students will have hands-on experience in special polymer synthesis, characterization and their applications

Assessment Strategies (e.g. exams, projects, university rubrics, etc.):
Writing everyday lab reports, data analysis, interpretation of results, lab tests, and presentations

PLEASE ATTACH SYLLABUS

Additional Resources Required (e.g. library or multimedia resources, technology, space, major expense, etc.):
Library

Will any additional student fees be required (e.g. equipment, clothing, travel, licensing, etc.)?  □ Yes  □ No

If “yes,” please realize that it will need to gain approval of the President’s Council.

Rationale: ______
Is this course to be considered for General Education? □ Yes ◯ No

If “yes,” please indicate the University’s General Education Goals met by this course AND the assessment data that will be collected to measure these goals:

Please realize that it will need to gain approval of the General Education Committee.

Will this course be required of any education majors? □ Yes ◯ No

If “yes,” please realize that it will need to have the approval of the Teacher Education Council.

Will this course be submitted for Departmental Academic Honors? □ Yes ◯ No

If “yes,” please realize that it will need to have the approval of the Faculty Senate Departmental Academic Honors Committee.

What additional costs will be required for this course (e.g. staffing, equipment, etc.)? Costs are covered by the polymer initiative

Will this course impact any other department/college/unit’s curricula or programs? □ Yes ◯ No

If “yes,” have relevant discussions occurred? □ Yes □ No

Documentation of these discussions (e.g. copies of e-mails, memos, etc.) is required to be attached.

Originating Department: Please complete this form and upload, with syllabus, to the Zimbra Briefcase, “Undergraduate Curriculum Legislation” (within the appropriate College folder, “Preliminary Legislation”), to allow for review and questions. Any modifications should be saved as “original file name.version2.docx” (e.g. MATH 343.version 2.docx) and uploaded as well.

Please print the final version of this form, apply the appropriate signature, and forward to the Office of the Registrar.
PITTSBURG STATE UNIVERSITY

LEGISLATIVE PROCESS
AUTHORIZATION/NOTIFICATION SIGN-OFF SHEET

Signatures:

☑ Approved: Department Chairperson
   Date: 2/13/2013 Signature, Department Chairperson
   [Signature]

☑ Approved: College Curriculum Committee
   Date: 4/11/13 Signature, College Curriculum Committee Chair
   [Signature]

☑ Approved: Dean of College
   Date: 2/13/13 Signature, Dean
   [Signature]

☐ Approved: General Education Committee (if applicable)
   Date: _______ Signature, General Education Committee Chair
   [Signature]

☐ Approved: Teacher Education Council (if applicable)
   Date: _______ Signature, Teacher Education Council Chair
   [Signature]

☐ Approved: Faculty Senate University Undergraduate Curriculum Committee
   Date: 11/15/13 Signature, Undergraduate Curriculum Committee Chair
   [Signature]

☐ Approved: Faculty Senate
   Date: _______ Signature, Recording Secretary, Faculty Senate
   [Signature]

Please Note
This is a two-to-three-month process, at least, and is designed to eliminate questions and concerns at the beginning of the process. Any questions/concerns not addressed prior to the review by the College Curriculum Committee and the Faculty Senate Undergraduate Curriculum Committee may result in an additional month added to the process.
Attach syllabus here:
Please see attached file.
COURSE DESCRIPTION

CHEM 690: Selected research projects in polymer chemistry (1 - 3 hrs)

Design and synthesis of selected research projects, analysis of synthetic scheme, characterizations of synthesized polymers, and their applications. Polymer research problems.

Prerequisite/corequisite: CHEM 360 or CHEM 625 or permission of instructor

Purpose/justification for course: Selected topics of polymer research for advanced applications in polymer science and technology

Objectives/Student Learning Outcomes: Students will have hands-on experience in special polymer synthesis, characterization and their applications.

Assessment Strategies: Writing everyday lab reports, data analysis, interpretation of results, lab tests, and presentations.
Course Syllabus

CHEM 690: Selected research projects in polymer chemistry

Instructor: CHEM/PET Faculty
Email: TBD
Phone No.: TBD

Office: TBD
Lecture room: TBD
Office Hours: TBD

I. Descriptive Information

A. Course Number: CHEM 690

B. Course Title and Credits: Selected research projects in polymer chemistry (1 - 3 credits)

C. Description of the Course: Design and synthesis of selected research projects, analysis of synthetic scheme, characterizations of synthesized polymers, and their applications. Polymer research problems.

1. Synthesis of advanced polymers
2. Conducting polymers and biodegradable polymers
3. Characterization of synthesized polymers
4. Advanced applications of the polymers
5. Writing laboratory reports
6. Presentations of the research outcome
7. Polymer research problems.

D. Required Text:

1. Laboratory Safety for Chemistry Students, by Robert H. Hill and David Finster, Wiley
3. Research journals

Note: Instructor reserves the right to change the required text books for better learning experience of the students.
E. Prerequisites: CHEM 360 or CHEM 625 or permission of instructor

II. Laboratory Course Objectives

The laboratory course is designed to:

1. Introduce advanced concepts of organic polymer synthesis
2. Develop various synthetic routes for the synthesis of designer polymers
3. Introduction of advanced characterization techniques
4. Introduce advanced applications of synthesized polymers
5. Develop skills in critical thinking through designing new polymers
6. Develop advanced skills of analyzing data
7. Maintain laboratory notebook

III. Course Requirements

A. Participation in the laboratory:

Regular participation is very important for the successful completion of the research work. It is your responsibility to attend laboratory regularly and keep up to date with the experimental techniques in laboratory notebook so that you do not fall behind. As is true with most sciences, polymer chemistry is a structured subject. This means that an understanding of the laboratory protocols will depend heavily upon an understanding of laboratory techniques involved in research. Also please keep in mind that mere memorization of the facts without understanding the subject matter is almost certain to result in a poor performance in this laboratory course. In fact, the goal of each experiment and presentation will evaluate your understanding of the course material as opposed to mere memorization. This means that you will ultimately be expected to utilize the basic principles learnt in this course.

There will be no “extra credit” work in this course.

B. Homework:

A series of literature will be given during the courses. You will be responsible learn experimental techniques effectively. This helps you to understand critically how to
perform laboratory experiments and finish your projects on time. You should therefore view learning how to perform these daily experimental exercises as a high priority.

IV. Evaluation of Performance

Your grade in this course will be determined by a series of laboratory tests, successes on research projects, analytical and data interpretation skills and final presentation of the research work. No makeup evaluation will be given unless prior permission was taken for absences. The division of the percentage grade is given below:

- Lab report writing: 20 points
- Experimental skills: 15 points
- Regular Participation: 15 points
- Home work: 10 points
- Final lab test: 25 points
- Final Presentation: 15 points

Total = 100 points

Your overall letter grade for the course will be determined using the following scale:

<table>
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<tr>
<th>Total Score</th>
<th>Letter Grade</th>
</tr>
</thead>
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<tr>
<td>&gt; 85%</td>
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V. Texts

1. Laboratory Safety for Chemistry Students, by Robert H. Hill and David Finster, Wiley
3. Research journals
Note: Instructor reserves the right to change the required text books for better learning experience of the students.

Recommended: Calculator with scientific notation.

VI. Calendar

Tentative Dates for homework, lab reports, presentations and lab test

1: TBA
2: TBA
3: TBA
4: TBA

Comprehensive final presentation: According to University Final Exam Schedule. PLEASE Don’t make any travel plans that conflicts with your Exam Schedule.

Please note that the examination topics to be covered are approximate only. The materials covered in each examination will be announced in the lecture class.

The purpose of each examination is to evaluate the understanding of the course material, as opposed to mere memorization. This means that the student will ultimately be expected to utilize basic principles in the solution of new problem situations.

VII. Academic Misconduct

You will be allowed to use a non-programmable calculator during the quizzes and examinations in this course. No other help is allowed. Use of other materials, information or persons during a quiz or exam will be viewed as cheating. In other words, collaborative efforts to answer quiz or exam questions are strictly forbidden, and your answers to quiz or exam questions must be the result of strictly individual efforts. Evidence of cheating as defined above will result in a grade of zero for that quiz or exam for the first offense, even if the cheating activity involves only one question. In the second instance of such activity, the instructor will proceed with formal charges against the student, to effect, at least a failing grade in the course. Please consult the policy on Student Academic Dishonesty on in the University Catalog (2013-2014).

VIII. Disclaimer: Instructor reserves the right to revise the content of the syllabus as needed throughout the semester for better learning experience of the students.
Department: HPASS    College: Arts & Sciences

Date of Submission to the Department: August 27, 2013

Contact Person: Brad Cameron    Faculty member    Chair

Brief Description of Change: I would like to add SWK 400 Social Work Case Management as one of our elective courses in the social work curriculum.

Type of Modification:
☐ Name    ☐ Credit Hour    ☐ Course content/objectives    ☐ Prerequisite Change    ☒ Other

Rationale for Change: The majority of our graduates' first positions as professional social workers will be as case managers, consequently I and my colleagues think that a course specific to the various types of social work case management that may be available to them would be beneficial.

Information from Existing Major

Name of Existing Major: Social Work    Current CIP Number: ______

Please provide the course information as it currently appears in the catalog:

Major Requirements (61-64 hours)
The social work major consists of not less than 61 hours distributed as follows:

Pre-Admission Courses (7 hours)
SWK 201: Introduction to Social Work ......................... 3
SWK 223: Basic Helping Skills .................................. 3
SWK 222: Basic Helping Skills Experience ....................... 1

Post-Admission Courses
SWK 340: Social Work with Families and Children ............. 3
SWK 344: Mental Health Theory and Practice .................. 3
SWK 365: Social Process and Social Policy ..................... 3
SWK 375: Multiculturalism and Diversity in Social Work Practice ................................................................. 3
or SOC 443: Race and Ethnic Relations ......................... 3
or PSYCH 720: Multicultural Issues in Psychology and Counseling ................................................................. 3
SWK 385: Human Behavior in Social Environment: Individual and Family Functioning ................................. 3
SWK 420: Advanced Social Work Practice I .................. 3
or SOSCI 387: Social Research Design ..................... 4
or PSYCH 389: Research Methods in Psychology I ...... 3
and PSYCH 392: Research Methods in Psychology II .... 3
SWK 485: Human Behavior in the Social Environment: Groups and Communities ...... 3
SWK 599: Social Work and the Law .......................... 3
SWK 600: Advanced Social Work Practice II: Mezzo .......... 3
SWK 601: Advanced Social Work Practice III: Macro ...... 3
SWK 621: Practicum in Social Work .......................... 9
SWK 622: Integrative Seminar in Social Work ............... 3
SWK 624: Practicum in Social Work is part of the Professional Semester.
SWK 622 Integrative Seminar in Social Work is part of the Professional Semester.
Electives (6 hours: All Social Work Electives must be 300 level courses or above)
Choose two courses from the following list:
SWK 341: Social Work and the Aged .......................... 3
SWK 342: Health Care and Social Work ..................... 3
SWK 343: Social Work with Families Affected by Disability .................................................. 3
SWK 345: Topics in Social Work (_____ ) ................. 1-3
SOSCI 388: Social Research Analysis ....................... 4
SWK 399: Social Work and the Court Process ............ 3
GEOG 401: Urban and Regional Planning .................. 3
SOC 443: Race and Ethnic Relations ........................ 3
JUST 500: Criminal Law and Society ....................... 3
JUST 501: Criminal Procedure ................................ 3
SOC 527: Correctional Systems ................................ 3
SOC 538: Juvenile Delinquency .............................. 3
PSYCH 573: Abnormal Psychology ......................... 3
SWK 598: Chemical Abuse Treatment and Services .......... 3
Information for Proposed Modified Major

Please provide the course information as you wish it to appear in the catalog:

Name of Modified Major: Major Requirements (61-64 hours)
The social work major consists of not less than 61 hours distributed as follows:

Pre-Admission Courses (7 hours)
SWK 201: Introduction to Social Work ......................... 3
SWK 221: Basic Helping Skills .................................. 3
SWK 222: Basic Helping Skills Experience .................... 1

Post-Admission Courses
SWK 340: Social Work with Families and Children .......... 3
SWK 344: Mental Health Theory and Practice ................. 3
SWK 365: Social Process and Social Policy ..................... 3
SWK 375: Multiculturalism and Diversity in Social Work Practice ... 3
or SOC 443: Race and Ethnic Relations ................. 3
or PSYCH 720: Multicultural Issues in Psychology and Counseling ...... 3

SWK 385: Human Behavior Social Environment:
Individual and Family Functioning ......................... 3
SWK 420: Advanced Social Work Practice I ................. 3
SWK 465: Social Welfare Policy Analysis ................. 3
or SOSQ 387: Social Research Design ..................... 4
or PSYCH 389: Research Methods in Psychology I ........ 3
and PSYCH 392: Research Methods in Psychology II .... 3
SWK 409: Social Work Case Management ...................... 3
SWK 485: Human Behavior in the Social Environment: Groups and Communities ... 3
SWK 599: Social Work and the Law ......................... 3
SWK 600: Advanced Social Work Practice II: Mezzo .......... 3
SWK 601: Advanced Social Work Practice III: Macro ........ 3
SWK 621: Practicum in Social Work ......................... 9
SWK 622: Integrative Seminar in Social Work ............. 3
SWK 621 Practicum in Social Work is part of the

Revision to Major

Pittsburg State University

Last Revision: Fall, 2012
Professional Semester.

SWK 622 Integrative Seminar in Social Work is part of
the Professional Semester.

Electives (6 hours: All Social Work Electives must be 300 level courses or above)

Choose two courses from the following list

SWK 341: Social Work and the Aged ........................................... 3
SWK 342: Health Care and Social Work ......................................... 3
SWK 343: Social Work with Families Affected by Disability ................................................................. 3
SWK 345: Topics in Social Work ..................................................... 1-3
SOSCI 388: Social Research Analysis ............................................... 4
SWK 399: Social Work and the Court Process ................................... 3
SWK 400: Social Work Case Management ....................................... 3
GEOG 401: Urban and Regional Planning ....................................... 3
SOC 443: Race and Ethnic Relations .............................................. 3
JUST 500: Criminal Law and Society ............................................. 3
JUST 591: Criminal Procedure .................................................... 3
SOC 527: Correctional Systems ................................................... 3
SOC 548: Juvenile Delinquency .................................................... 3
PSYCH 571: Abnormal Psychology .............................................. 3
SWK 598: Chemical Abuse Treatment and Services ......................... 3

Course Description: This course will provide participants with specific skills and knowledge in: case management with clients in medical hospital settings, correctional settings, public welfare settings, clients with mental disorders, clients with substance abuse and dependency disorders and those who have been diagnosed with both. Assessment skills leading to a differential diagnosis and intervention planning and implementation and crisis management skills.
Date first offered: Fall, spring 2014
(Year)

Additional Resources Required (e.g. library or multimedia resources, technology, space, major expense, etc.): **none**

Will any additional student fees be required (e.g. equipment, clothing, travel, licensing, etc.)? □ Yes ☒ No

If “yes,” please realize that it will need to gain approval of the President’s Council.

Rationale: **N/A**

Will this modification affect any education majors? □ Yes ☒ No

If “yes,” please realize that it will need to have the approval of the Teacher Education Council.

What additional costs will be required for this modification (e.g. staffing, equipment, etc.)? **N/A**

Will this revision impact any other department’s/college’s/unit’s curricula or programs? □ Yes ☒ No

If “yes,” have relevant discussion occurred: □ Yes □ No

Documentation of these discussions (e.g. copies of e-mails, memos, etc.) is required

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Revision to Major

Last Revision: Fall, 2012
PITTSBURG STATE UNIVERSITY

LEGISLATIVE PROCESS
AUTHORIZATION/NOTIFICATION SIGN-OFF SHEET

☑ Approved: Department Chairperson
   Date 11/24/11 Signature, Department Chairperson
   Donald W. Umez

☑ Approved: College Curriculum Committee
   Date 11/24/11 Signature, College Curriculum Committee Chair
   [Signature]

☑ Approved: Dean of College
   Date 11/24/11 Signature, Dean
   [Signature]

☐ Approved: Teacher Education Council (if applicable)
   Date ______ Signature, Teacher Education Council Chair
   [Signature]

☐ Approved: Faculty Senate Undergraduate Curriculum Committee
   Date 11/24/11 Signature, Undergraduate Curriculum Committee Chair
   [Signature]

☐ Approved: Faculty Senate
   Date ______ Signature, Recording Secretary, Faculty Senate
   [Signature]

☐ Final approved packet forwarded to Provost’s office.
   Date ______ Signature, Recording Secretary, Faculty Senate
   [Signature]

Approval at Kansas Board of Regents level:

☐ COCAO:
   Date: ______
   [Signature]

The Provost’s Office will notify the department, college and Registrar of completion of the approval process

Originating Department(s): After completing this form, in its entirety, please upload it to the Zimbra Briefcase, "Undergraduate Curriculum Legislation" (within the appropriate College folder, "Preliminary Legislation"), to allow for review and questions. Any modifications should be saved “original file name_version2.docx” and uploaded as well.

Following final College Curriculum Committee approval, please print the final version of this form, apply the appropriate signature, and forward to the Office of the Registrar.

Following Faculty Senate Approval, SUBMIT SIGN-OFF SHEET AND FINAL COMPLETE PACKAGE, in electronic format, TO THE OFFICE OF THE PROVOST
(229 RUSS HALL) FOR FORWARDING TO THE KANSAS BOARD OF REGENTS
FOR BOARD APPROVAL.

Revision to Major

Last Revision: Fall, 2012
Please Note

This is at least a two-to-three month process from the time of first submission and is designed to eliminate concerns and questions at the beginning of the process. Any questions/concerns not addressed prior to the review by the College Curriculum Committee and the Faculty Senate University Undergraduate Curriculum Committee may result in an additional month added to the process, before it is sent to the Kansas Board of Regents for approval, which may result in a delay in implementation.
Request for New Course
(Undergraduate Course Numbers through Course Number 599)

Department: HPASS  College: A&S

Contact Person: BRAD CAMERON

Submission Date: 9/3/13

Faculty member  Chair

Is this new course proposal related to, and/or affect, any other department's/college's/unit's curricula or programs at Pittsburg State University?

Yes  No

Whether a "yes" or "no" response, please provide an explanation. Provide documentation of any discussions (e.g. copies of e-mails, memos, etc.) that have occurred.

This course will not conflict with or affect any other department's/college's/unit's curricula or programs at Pittsburg State University. Psychology and Counseling offers a Mental Health Case Management Course and I have spoken with Dr. David Hurford, Chair of Psychology and Counseling, and he assures me that he has no objection with Social Work offering a more generalized case management course. Social Workers provide the bulk of case management services, so it only makes sense to offer this course in our program.

Proposed Course:

Course Number: SWK 400

Title of Course: SOCIAL WORK CASE MANAGEMENT

Credit Hours: 3

Date first offered: 2014  Fall  Spring  Summer

Semester/Year

(check all that apply)

Prerequisite: NONE

Course Description (as it will appear in the next catalog): This course will provide participants with specific skills and knowledge in: case management with clients in medical hospital settings, correctional settings, public welfare settings, clients with mental disorders, clients with substance abuse and dependency disorders and those who have been diagnosed with both, assessment skills leading to a differential diagnosis and intervention planning and implementation and crisis management skills.

Purpose/Justification for Proposed Course: THE MAJORITY OF BSW GRADUATES FROM THE PSU SOCIAL WORK PROGRAM WILL BE INITIALLY HIRED AS CASE MANAGERS FOR VARIOUS SOCIAL SERVICE AGENCIES.

Objectives/Student Learning Outcomes (as it will appear in the syllabus)

1. Inform students about the concept and function of case management in general.
2. Inform students of the historical development of case management.
3. Inform students of the requisite knowledge in order to practice social work case management in a variety of social service settings.
4. Inform students of the specific case management process.
5. Provide opportunity for students to work with specific case examples and apply the knowledge learned

Assessment Strategies [e.g., exams, projects, university rubric, etc. (as it will appear in the syllabus)]
1. Attendance
2. Participation
3. Research paper related to a particular area of case management
4. Mid-term and comprehensive final

If you wish to attach a syllabus, you may attach it to the end of this document as part of the packet.
Additional Questions

1. Additional resources required (e.g. library or multimedia resources, technology, space, major expense, etc.):
   MEDIATED CLASSROOM

2. Will any additional student fees be required (e.g. equipment, clothing, travel, licensing, etc.)?
   □ Yes  ☒ No  If "yes," please realize that it will need to gain approval of the President's Council.

   Please give the rationale for additional student fees:
   N/A

3. Is this course to be considered for General Education?  □ Yes  ☒ No

   If "yes," please indicate the University's General Education Goals met by this course AND the assessment data that will be collected to measure these goals:

   Please realize that it will need to gain approval of the General Education Committee.

4. Will this course be required of any education majors?  □ Yes  ☒ No

   If "yes," please realize that it will need to have the approval of the Council for Teacher Education.

5. Will this course be submitted for Departmental Academic Honors?  □ Yes  ☒ No

6. What additional costs will be required for this course (e.g. staffing, equipment, etc.)?
   ☒ NONE

Request for New Course- Revised Summer 2013
PITTSBURG STATE UNIVERSITY
LEGISLATIVE PROCESS
AUTHORIZATION/NOTIFICATION SIGN-OFF SHEET

☑ Approved: Department Chairperson
  Date: 9/3/19 Signature, Department Chairperson: Donald W. Van

☒ Approved: College Curriculum Committee
  Date: 1/13 Signature, College Curriculum Committee Chair: [Signature]

☒ Approved: Dean of College
  Date: 1/17 Signature, Dean: [Signature]

☐ Approved: General Education Committee (if applicable)
  Date: ______ Signature, General Education Committee Chair: [Signature]

☐ Approved: Council for Teacher Education (if applicable)
  Date: ______ Signature, Council for Teacher Education Chair: [Signature]

☐ Approved: Faculty Senate University Undergraduate Curriculum Committee
  Date: 11/18/19 Signature, Undergraduate Curriculum Committee Chair: [Signature]

☐ Approved: Faculty Senate
  Date: ______ Signature, Recording Secretary, Faculty Senate: [Signature]

Each college curriculum representative will notify their respective college and department(s) of the completion of the approval process.

Originating Department: Please complete this form and upload to the Zimbra Briefcase, "Undergraduate Curriculum Legislation" (within the appropriate College folder, "Preliminary Legislation"), to allow for review and questions. Any modifications should be saved as "original file name.version2.docx" (e.g. MATH 343.version2.docx) and uploaded as well.

Please print the final version of this form, apply the appropriate signatures, and forward to the Office of the Registrar.

Please Note: This is a 2-3 month process, at least, and is designed to eliminate questions and concerns at the beginning of the process. Any questions/concerns not addressed prior to the College Curriculum Committee and the Faculty Senate University Undergraduate Curriculum Committee may result in an additional month added to the process.

Request for New Course - Revised Summer 2013
PITTSBURG STATE UNIVERSITY
SOCIAL WORK PROGRAM
SYLLABUS

TITLE OF COURSE: Social Work Case Management – SWK 400

INSTRUCTOR: Brad Cameron
327 A Russ Hall
620-235-4331
bcameron@pittstate.edu

COURSE DESCRIPTION: This course will provide participants with specific skills and knowledge in: case management with medical patients, correctional clients, clients in public welfare, clients with mental disorders, clients with substance abuse and dependency disorders and those who have been diagnosed with both, assessment skills leading to a differential diagnosis and intervention planning and implementation and crisis management skills.

COURSE OBJECTIVES:

1. Inform students about the concept and function of case management in general.
2. Inform students of the historical development of case management.
3. Inform students of the requisite knowledge in order to practice social work case management in a variety of social service settings.
4. Inform students of the specific case management process.
5. Provide opportunity for students to work with specific case examples and apply the knowledge learned

COURSE REQUIREMENTS:

1. Attendance
2. Participation
3. Completion of all in-class and out of class assignments
4. Mid-term and comprehensive final
5. Write a research paper on a particular area of case management to include: history, practice philosophy, practice methods, and hoped for outcomes.
EXAM PROCEDURE:

The examinations will be both objective and subjective. A scantron will be required for the examinations.

If a student takes an exam on the date that it is scheduled, he/she will be allowed to take the exam home and take it again on a separate scantron. The grades on the two exams will be averaged and that is the grade the student will ultimately receive. If a student takes the exam late, he/she will get only one opportunity to take the exam and the grade will be based on the results of that one exam.

The procedure for the final exam will be reversed. The student will be given a final exam to take home and complete and will return the exam on the day of the final and then will take an in-class final derived from the take-home. The grades will again be averaged and the student will receive the averaged grade.

GRADING SCALE:

A = 90 to 100%
B = 80 to 89%
C = 65 to 79%
D = 50 to 64%
F = Below 50%

If a student is within 3% points from a higher final grade, has attended every class and actively participated, that student will receive the higher grade. Otherwise, students will get EXACTLY what they have earned, even if their final score is within one percentage point of the higher grade.

Students who miss the designated exam date will be allowed to make up the exam but not take it a second time.

No extra credit will be given for any reason.
INSTRUCTIONAL RESOURCE:

The class will be based on power-point presentation and classroom discussion.
The Social Worker and Psychotropic Medication by Bentley and Walsh is recommended by not required.

ATTENDANCE POLICY:

Each student starts out with a 100% attendance record. Students are allowed one absence gratis. After one absence, the student’s 100% score will be reduced by 15% for each subsequent absence. The attendance score will be treated like a test score and factored into the student’s overall scores as such. THERE ARE NO EXCUSED ABSENCES please do not ask.

ACADEMIC DISHONESTY:

Any student found to be cheating on exams or knowingly plagiarizing will be summarily dismissed from class; his/her advisor will be notified and the student will be given an F for the course.

POLICY ON DISCRIMINATION:

No student will be discriminated against for any reason. Any student who believes that he/she has suffered any type of discrimination, harassment or unfair treatment, should immediately contact Cindy Johnson in the Office of Equal Opportunity 218b Russ Hall, 620-235-4189 and the Interim Chair of the HPASS, Dr. Don Viney, 412 F Russ Hall, 620-235-4324.

SPECIAL ACCOMMODATION:

Any student, who has a disability that may interfere with his/her opportunity for successful participation in the course, should contact the instructor immediately so special accommodations can be made. The student should also contact the Office of Equal Opportunity 218b Russ Hall, 620-235-4189.
Request for New Course

(Undergraduate Course Numbers through Course Number 699)

Department: Automotive  College: Technology

Submission Date: August 16, 2013

Contact Person: Tim Dell  □ Faculty member  □ Chair

Is this new course proposal related to, and/or affect, any other department’s/college’s/unit’s curricula or programs at Pittsburg State University?
□ Yes  □ No

Whether a “yes” or “no” response, please provide an explanation. Provide documentation of any discussions (e.g. copies of e-mails, memos, etc.) that have occurred.
Yes, this course will be using the School of Construction's Caterpillar simulators and the attached email provides evidence of our collaboration.

Proposed Course:
Course Number: AT 641

Title of Course: Construction Equipment Systems

Credit Hours: 3 hours

Date first offered: Spring 2014  □ Fall  □ Spring  □ Summer
(Semester/Year)  (check all that apply)

Prerequisite: none

Course Description (as it will appear in the next catalog): Study the design, operation and service of construction equipment (CE) power train including: undercarriage systems, power shift and automatic transmissions, torque converters, hybrid drives, and track steering systems. The course also includes studying the features and differences found in the common CE and industrial machines, for example: skid steers, excavators, motor graders, scrapers, wheel and track loaders, dozers, haul trucks, and cranes (including overhead lifting and rigging). Students will receive hands-on experience operating a Caterpillar 160M motor grader, a Caterpillar D6 dozer, and four Caterpillar Simulators: wheel loader, excavator, dozer, and motor grader. Students will participate in a regional CE industry tour. Students will also be broken into groups to make a formal presentation.

Purpose/Justification for Proposed Course: The department currently attempts to cover both Construction Equipment and Agricultural Equipment in a single three credit hour course, AT 640 Off Highway Systems. This proposal would allow the department to expand the previous three hours of curriculum into six hours, with three credit hours being dedicated to a construction equipment class and three credit hours being dedicated to an agricultural equipment class.

Objectives/Student Learning Outcomes (as it will appear in the syllabus)
A. Identify different types of construction equipment, as well as distinguish the production advantages and disadvantages of the machines.
B. Distinguish the advantages and disadvantages of the unique systems commonly used in construction machinery.
C. Gain practical experience operating construction equipment.
D. Participate in a regional CE industrial tour to apply knowledge gained from the classroom.

Request for New Course: Revised Summer 2013
F. Identify methods for successfully maintaining an operational fleet by interviewing an industry representative and gain experience in reporting the findings in a group format.

Assessment Strategies [e.g., exams, projects, university rubric, etc. [as it will appear in the syllabus]]
1. Daily quizzes often contain 20 questions.
2. Three 100 question tests.
3. An outside assignment that requires the group to interview an industry equipment manager for a large contractor.
4. A group presentation to formally present the group findings of the outside assignment.
5. 1 or 2 Crosby Overhead lifting tests that contains 50 or 80 questions.
6. Outside class hands-on activity requiring students to gain practical operational experience operating PSU’s 4 Caterpillar Simulators, and PSU’s Caterpillar D6R dozer, and PSU’s Caterpillar 160M motor grader.
7. A 125 questions comprehensive final exam.

If you wish to attach a syllabus, you may attach it to the end of this document as part of the packet.
Additional Questions

1. Additional resources required (e.g. library or multimedia resources, technology, space, major expense, etc.):
   Students will utilize the KTC library to view the Crosby Overhead lifting interactive CDs. Students will operate the School of Construction's four Caterpillar simulators (dozer, motor grader, wheel loader, and excavator). Students will operate PSU's Caterpillar dozer and Caterpillar motor grader.

2. Will any additional student fees be required (e.g. equipment, clothing, travel, licensing, etc.)?
   □ Yes  □ No  If "yes," please realize that it will need to gain approval of the President's Council.

   Please give the rationale for additional student fees:

3. Is this course to be considered for General Education? □ Yes  □ No

   If "yes," please indicate the University's General Education Goals met by this course AND the assessment data that will be collected to measure these goals:

   Please realize that it will need to gain approval of the General Education Committee.

4. Will this course be required of any education majors? □ Yes  □ No

   If "yes," please realize that it will need to have the approval of the Council for Teacher Education.

5. Will this course be submitted for Departmental Academic Honors? □ Yes  □ No

6. What additional costs will be required for this course (e.g. staffing, equipment, etc.)?
   A departmental graduate assistant will be utilized when students are operating the Caterpillar Simulators.
Each college curriculum representative will notify their respective college and department(s) of the completion of the approval process.

Originating Department: Please complete this form and upload to the Zimbra Briefcase, "Undergraduate Curriculum Legislation" (within the appropriate College folder, "Preliminary Legislation"), to allow for review and questions. Any modifications should be saved as “original file name.version2.docx” (e.g. MATH 343.version 2.docx) and uploaded as well.

Please print the final version of this form, apply the appropriate signatures, and forward to the Office of the Registrar.

Please Note: This is a 2-3 month process, at least, and is designed to eliminate questions and concerns at the beginning of the process. Any questions/concerns not addressed prior to the College Curriculum Committee and the Faculty Senate University Undergraduate Curriculum Committee may result in an additional month added to the process.
Fwd: Investment in CAT Motor Grader Simulator

From: Tim Dell <tdell@pittstate.edu>  
Mon, Sep 23, 2013 02:02 PM  
Subject: Fwd: Investment in CAT Motor Grader Simulator  
To: Kindra O'Connor <koconnor@pittstate.edu>

Tim Dell, PhD  
Associate Professor  
Automotive Technology, KTC N105b  
Pittsburg State University  
Pittsburg, KS 66762  
620 235 4182  
tdell@pittstate.edu  
www.pittstate.edu/autotech

From: "James Otter" <jlotter@pittstate.edu>  
To: "Tim Dell" <tdell@pittstate.edu>  
Cc: "ccrain" <ccrain@pittstate.edu>  
Sent: Wednesday, January 2, 2013 3:58:38 PM  
Subject: Re: Investment in CAT Motor Grader Simulator

Thanks. That is what I wanted to hear. As far as use, I would work through Chad Crain, our lab technician who works with the simulators. My feeling would be to go ahead and get the motor grader simulator purchased since we have the funding. That would give us 4 pieces of equipment in one lab that would help both of our programs.

James Otter, LS, LEED-AP  
Director, School of Construction  
College of Technology  
Pittsburg State University  
1701 South Broadway  
Pittsburg, KS 66762

Phone: 620.235.4349  
e-mail: jlotter@pittstate.edu

From: "Tim Dell" <tdell@pittstate.edu>  
To: "James Otter" <jlotter@pittstate.edu>  
Cc: "Justin Honey" <jhoney@pittstate.edu>, "Paul Zerkel" <pzerkel@pittstate.edu>, "Bob Frisbee" <rlfrisbee@pittstate.edu>, "Bob Schroer" <rschroer@pittstate.edu>
Jim
Thanks much for the email. I appreciate it.

The short answer is that I very much want to incorporate the use of the Cat simulators. My first goal was to work on it this winter break. Unfortunately I was unable to do that because I found that my auto trans classes needed extensive work to become copyright compliant so I have been investing 100% of my time getting those two classes up to speed for Spring 2013. This spring is the first time I have taught them in 4.5 years and thus they needed to be revised to be compliant and that prep has been consuming.

I do teach AT 640 Off Highway systems during the Spring semester including this Spring 2013. I have been unable to step away from my Auto Trans prep, in order to visit with SOC folks about simulator integration into AT 640.

The long term goal would be to split AT 640 Off Highway systems, into two classes (3 hours Ag and another 3 hours dedicated to Construction equipment). We have talked a lot about doing that some day in the future. Even if that does not take place I very much want to integrate use of the Cat simulators into the existing AT 640. Worse case scenario it might be 12 months from now, depending upon if I get caught up on the AT 414 Auto Trans this semester.

Who is my contact if I find time this semester for the simulators?

I think the Motor Grader is a great idea, because it is one of the most complex electronic and hydraulic machines Cat produces, plus we have the actual machine as well.

I can assure you that I want to integrate the Cat simulators, no later than next Spring.

Tim Dell, PhD
Associate Professor
Automotive Technology, KTC N105b
Pittsburg State University
Pittsburg, KS 66762
620 235 4182
tdoll@pittstate.edu
www.pittstate.edu/autotech

From: "James Otter" <jlotter@pittstate.edu>
To: "Justin Honey" <jhoney@pittstate.edu>, "Tim Dell" <tdoll@pittstate.edu>, "Paul Zerkerl" <pzerkel@pittstate.edu>
Sent: Wednesday, January 2, 2013 3:30:16 PM
Subject: Investment in CAT Motor Grader Simulator
We are considering adding the new CAT motor grader simulator to our three other simulators. Since this is a new simulator it costs a little more and has a very extensive "walk-around/maintenance" feature. We have the funds to purchase the unit, but I want your opinion on whether or not you would use this along with the other 3 units if we added the motor grader. I believe one of the keys to greater use will lie with the heavy diesel program using them more in their course - Tim - what do you think?

Let me know and if you feel good about this I will proceed with the purchase process. Thanks.

James Otter, LS, LEED-AP  
Director, School of Construction  
College of Technology  
Pittsburg State University  
1701 South Broadway  
Pittsburg, KS 66762

Phone: 620.235.4349  
e-mail: jlotter@pittstate.edu
Course Number: AT 641
Credit Hours: 3
Semester: Spring 2014
Associate Professor: Dr. Tim Dell
Email: tdell@pittstate.edu

Title: Construction Equipment Systems
Course Time Schedule: 4:00 – 5:50 pm T & TH
Course Delivery Method: Face-to-Face
Office Location: N105b, KTC
Office Phone: (620) 235 – 4182
Office Hours: T/TH 4:00-5:30 pm

Course Description:
Study the design, operation and service of Construction Equipment power train including: undercarriage systems, power shift and automatic transmissions, torque converters, hybrid drives, and track steering systems. The course also includes studying the features and differences found in the common CE and industrial machines, for example: skid steers, excavators, motor graders, scrapers, wheel and track loaders, dozers, haul trucks, and cranes (including overhead lifting and rigging). Students will receive hands-on experience operating a Caterpillar 160M motor grader, a Caterpillar D6 dozer, and four Caterpillar Simulators: wheel loader, excavator, dozer, and motor grader. Students will participate in a regional CE industry tour. Students will also be broken into groups to make a formal presentation.

Prerequisites:

Purpose of the Course:
The primary purpose of this course is to give the student an opportunity to grow in his/her knowledge of Construction Equipment Systems.

Course Objectives:
A. Identify different types of construction equipment, as well as distinguish the production advantages and disadvantages of the machines.
B. Distinguish the advantages and disadvantages of the unique systems commonly used in construction machinery.
B. Gain practical experience operating construction equipment
C. Participate in a regional CE industrial tour to apply knowledge gained from the classroom
D. Identify methods for successfully maintaining an operational fleet by interviewing an industry representative and gain experience in reporting the findings in a group format.

Required Text and Materials (From the PSU Campus Book Store):
AT 641 Construction Equipment Course Supplemental Text, and

Northern Alberta Institute of Technology - Individual Learning Modules

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<tr>
<th>No.</th>
<th>Title</th>
<th>ISBN</th>
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<tbody>
<tr>
<td>1</td>
<td>Heavy Equipment Technician - Lifting Procedures and Wire Rope</td>
<td>190101b</td>
</tr>
<tr>
<td>2</td>
<td>Heavy Equipment Technician - Powershift &amp; Automatic Transmission Mechanical/Electronic Components</td>
<td>190303c</td>
</tr>
<tr>
<td>3</td>
<td>Heavy Equipment Technician - Undercarriage Systems Fundamentals and Service - Part A</td>
<td>190303hA</td>
</tr>
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<td>4</td>
<td>Heavy Equipment Technician - Undercarriage Systems Fundamentals and Service - Part B</td>
<td>190303hB</td>
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<tr>
<td>5</td>
<td>Heavy Equipment Technician - Torque Converter Fundamentals and Service Part A</td>
<td>190303h</td>
</tr>
<tr>
<td>6</td>
<td>Heavy Equipment Technician - Tracked Equipment Steering Fundamentals and Service - Part A</td>
<td>190303g</td>
</tr>
<tr>
<td>7</td>
<td>Heavy Equipment Technician - Tracked Equipment Steering Fundamentals and Service - Part B</td>
<td>190303h</td>
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</table>
Instructional resources:
A. OEM literature
B. Notes from Industry Seminars
D. World Wide Web
E. Caterpillar & John Deere Performance Handbooks.

Teaching Strategies:
A. Lectures
B. Assigned readings of printed materials.
C. Discussions
D. Industrial Tour
E. Hands-on operating experience

Delivery of Course Method: Conventional classroom face to face lecture

Crosby Interactive Compact Disc Rigging Instruction
Students are responsible for viewing the Crosby Overhead Lifting interactive CDs. Several Crosby CDs are available in the KTC Library located on the 2nd floor on the south side of the KTC. These CDs are NOT allowed to be taken home. You will need to check them out and view the corresponding panels using the KTC library computers. The tentative schedule lists the Crosby Test dates. If you wait until the last minute to view the CDs, then you might be unable to check the CDs out due to the large amount of students who are enrolled in this class!

Overall Evaluation
The student is graded on his or her ability to answer questions on objective & essay tests, quizzes, and daily assignments. The student is evaluated on the completion and quality of assigned work.

Evaluation Criteria:
A. Tests - 3 tests worth approximately 100-150 points each
B. Crosby Tests - 1 or 2 tests worth approximately 40-80 points each
C. Daily quizzes - worth 10 to 20 points each
D. Research Paper - worth approximately 280 points or Wichita tour worth approximately 50 points
E. Daily Participation Points - worth 5 points each
F. Caterpillar Simulator Exercises, worth approximately 10 to 40 points
G. Final Exam, worth approximately 250 points

Grading System
A=90-100%
B=80-89%
C=70-79%
D=60-69%
F=59% or lower

Safety:
Safety principles and concepts are appropriately noted and emphasized during class lectures as needed. Text and other instructional aids also stress safety.
**Class Assessments:** Tests and quizzes will not be handed back to students in class. The instructor will only review questions he deems are important from previous assessments.

If a student wishes to review a completed quiz or test then they must make an appointment with the instructor to review the quiz **no later than one week from when the quiz or test was originally administered.**

**Tobacco Use:**
The use of all types of tobacco in the classroom and laboratories is prohibited.

**Special Concerns:**
Any student, who has a disabling condition and may require some special arrangements to meet course requirements, should contact the instructor as soon as possible to make the necessary accommodations.

**Pittsburg State University Equal Opportunity Statement:**
Pittsburg State University is committed to a policy of educational equity. Accordingly, the University admits students, grants financial aid and scholarships, conducts all educational programs, activities, and employment practices without regard to race, color, religion, sex, national origin, sexual orientation, age, marital status, ancestry or disabilities.

**Academic honesty and integrity policy**
http://www.pittstate.edu/audiences/current-students/policies/rights-and-responsibilities/academic-misconduct.dot

**Academic dishonesty:**
Academic dishonesty is taken very seriously in this class. Please review page 38 of the 2008-2009 catalog to view the university’s guidelines. It states that "it includes, but is not limited to:
(a) giving or receiving unauthorized aid on examinations,
(b) giving or receiving unauthorized aid in the preparation of notebooks, themes, reports, papers or any other assignments,
(c) submitting the same work for more than one course without the instructor’s permission, and,
(d) Plagiarism. Plagiarism is defined as using ideas or writings of another and claiming them as one’s own. Copying any material directly (be it the work of other students, professors, or colleagues) or copying information from print or electronic sources (including the internet) without explicitly acknowledging the true source of the material is plagiarism. Plagiarism also includes paraphrasing another individuals’ ideas or concepts without acknowledging their work, or contribution. To avoid charges of plagiarism, students should follow the citation directions provided by the instructor and/or department in which the class is offered."

Cheating may result in student(s) receiving an "XF" for the course grade which indicates the result of academic dishonesty. Students should also know that cheating can result in being dismissed from the entire university.

**Attendance Grade and Policy:**
Every day of class we will have a daily Participation grade worth 5 points except for test days. Students who: (1) arrive to class on time, (2) attend the full class, participate and are engaged during the class (leaving electronic devices off, and are not distracting their neighbors or the instructors) can earn the full 5 points. Students who are tardy, miss a portion of class, sleeping, or more
interested in their electronic device will earn as little as 0 points. Therefore, plan on getting to class PRIOR to the class period starting, not at the time the class starts and be engaged in the class. We will also have a daily assignment typically in the form of a quiz worth 10 points each except for test days and dead week. Students who arrive to class late must turn in their quiz no later than the 2nd to last person who arrived to class on time. Students who miss a quiz or fail to turn in an assignment at the first of the hour, will earn a ZERO.

Sickness Policy H1N1 FLU EXCEPTION
Given the high transmission rate of the H1N1 virus and or other flues, I have special instructions regarding flu symptoms this semester. If you have flu symptoms, I do not want you coming to class and spreading the flu! Flu symptoms include fever, cough, sore throat, runny or stuffy nose, body aches, headache, chills and fatigue. Some people also experience diarrhea and vomiting. If you have these symptoms, please see your doctor or go to the health center. If caught early, you might be given a medication to mediate the symptoms, and those who have been exposed to it might be given a medication as a preventative measure. If you do this AND PROVIDE myself a note from your doctor at the next class then I will give you an ALTERNATE means of earning credit.

If you miss a class, it is your responsibility to have one of your class mates cover for you. Have your classmate share notes and pick up worksheets or assignments so that you will be prepared for the next class period! The instructor reserves the right to drop any student who misses 3 class periods in a row without notifying the instructor.

Extra Credit
Students will also have the opportunity to earn extra credit in the class for attending specific school functions as listed by the instructor. These functions will be worth 2-5 points each.

Drop the Two Lowest Quizzes
At the end of the semester students will be allowed to drop their TWO lowest quizzes. It is your choice on how you use the TWO lowest scores (bad quiz grade, absent, job interview, club participation, etc.). Therefore, you should wisely consider your TWO lowest scores. DO NOT SQUANDER them early, because you never know when you will need to miss school due to a family illness or death, or an unexpected problem.

Test Days: Students must take the test the day the test is given. If students miss the test the instructor will determine if the student may take the test late. If a student is allowed to take the test late, he or she will automatically have 10 points subtracted from their score (15 points on the Final Exam). Therefore, if a student knows that they must miss a test day, then they should ask the instructor if it is possible to take the test prior to test day, in order to be allowed to earn the full credit for the test.

The instructor might allow students to take a test or quiz early for exceptional reasons or cases.

Students are required to use PENCILS for all TESTS and ALL QUIZZES!
The following is a tentative schedule. Be assured that this schedule will be revised as needed throughout the semester!

**Daily Quizzes:** Also note the following daily requirements listed below are only a minimum. The instructor will have additional material added to the daily **QUIZZES and ASSIGNMENTS** from the previous class period.

**Week 1**
- Day 1 - Syllabus, Class Schedule, Student Presentation Projects
- Day 2 - Transmissions (Simple Planetary Gear Sets & Planetary Controls)

**Week 2**
- Day 3 - Torque Converters and other examples of CE hydrodynamic drives (torque dividers)
- Day 4 - CE transmission types (hauling, cycling, countershaft, compound planetary)

**Week 3**
- Day 5 - Caterpillar D6R dozer power shift transmission & Caterpillar 160M motor grader power shift transmission
- Day 6 - Undercarriage systems

**Week 4**
- Day 7 - Test #1
- Day 8 - Track Steering Part A

**Week 5**
- Day 9 - Track Steering Part B (including D7E electric drive dozer)
- Day 10 - Operate PSU's D6 dozer and SOC differential steer simulator

**Week 6**
- Day 11 - Wheel Loaders including John Deere's 644K & 944K electric drive loaders
- Day 12 - Skid Steers

**Week 7**
- Day 13 - Operate SOC wheel loader simulator & PSU compact tractor loaders & or SOC skid steer
- Day 14 - Excavator Intro

**Week 8**
- Day 15 - Excavator - Hybrid Excavators, Grade Control, and Mining Shovels
- Day 16 - Motor Graders

**Week 9**
- Day 17 - Operate SOC Motor grader simulator, excavator simulator and PSU's 160M motor grader
- Day 18 - Test #2

**Week 10**
- Day 19 - Scrapers
- Day 20 - Haul truck (rigid and articulation, mechanical and electric propulsion) or Crosby Test

**Week 11**
- Day 21 - Dozer Applications (track and wheel applications), & possibly TRACK LOADERS
- Day 22 - Wire Rope & Overhead lifting

**Week 12**
- Day 23 - Wire Rope & Overhead lifting
- Day 24 - Cranes

**Week 13**
- Day 25 - Telematics, or Compactors or Crosby Test
- Day 26 - Test #3

**Week 14**
- Day 27 - Outside Group Assignment
  - Interview Industry for Current Maintenance Strategies
    - (scheduling inspections, maintenance man-hours, backlog, estimating maintenance for a new job site, and scheduling technicians)
- Day 28 - Continued work on group report

**Week 15**
- Day 29 - Student Presentations
- Day 30 - Student Presentations

**FINAL EXAM**
<table>
<thead>
<tr>
<th>Day</th>
<th>Subject</th>
<th>Homework/Assignment/Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 14</td>
<td>T Syllabus, Class Schedule, Student Presentation Projects Unit 1.0 Simple Planetary Gear Sets</td>
<td>Participation Grade</td>
</tr>
<tr>
<td>Jan 16</td>
<td>TH Unit 1.0 Simple Planetary Gear Sets &amp; Unit 2.0 Planetary Controls</td>
<td>Planetary Quiz</td>
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<tr>
<td>Jan 21</td>
<td>T Unit 3.0 Powershift &amp; Automatic Transmission Mechanical/Electronic Components ILM 190303c</td>
<td>Planetary Quiz</td>
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<tr>
<td>Jan 23</td>
<td>TH Unit 4.0 Caterpillar D6R dozer power shift transmission &amp; Unit 5.0 Caterpillar 160M motor grader power shift transmission</td>
<td>Torque Converter Quiz</td>
</tr>
<tr>
<td>Jan 28</td>
<td>T Unit 6.0 Torque Converter Fundamentals &amp; Service ILM 190303b</td>
<td>Transmission Quiz</td>
</tr>
<tr>
<td>Jan 30</td>
<td>TH Unit 7.0 CE Undercarriage Systems Fundamentals &amp; Service ILM Part A &amp; B 190303h A &amp; B</td>
<td>Transmission Quiz</td>
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<tr>
<td>Feb 4</td>
<td>T Test #1</td>
<td>Study for Test</td>
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<tr>
<td>Feb 6</td>
<td>TH Unit 8.0 CE Tracked Equipment Steering Fundamentals and Service ILM Part A 190303g</td>
<td>Participation Grade</td>
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<tr>
<td>Feb 11</td>
<td>T Unit 8.1 CE Tracked Equipment Steering Fundamentals and Service Part B ILM 190303h</td>
<td>Track steering quiz</td>
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<tr>
<td>Feb 13</td>
<td>TH Operate PSU’s D6 dozer and SOC differential steer simulator</td>
<td>Machine Operation Grade</td>
</tr>
<tr>
<td>Feb 18</td>
<td>T Unit 10.0 Wheel Loaders including John Deere’s 644K &amp; 944K electric drive loaders</td>
<td>Track steering quiz</td>
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<tr>
<td>Feb 20</td>
<td>TH Unit 11.0 Skid Steers</td>
<td>Wheel Loader Quiz</td>
</tr>
<tr>
<td>Feb 25</td>
<td>T Operate SOC wheel loader simulator &amp; PSU compact tractor loaders &amp; or SOC skid steer</td>
<td>Machine Operation Grade</td>
</tr>
<tr>
<td>Feb 26</td>
<td>TH Unit 12.0 Excavator Intro</td>
<td>Skid Steer quiz</td>
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<tr>
<td>Mar 4</td>
<td>T Unit 12.1 Excavator – Hybrids, Grade Control, and Mining Shovels</td>
<td>Excavator Quiz</td>
</tr>
<tr>
<td>Mar 6</td>
<td>TH Unit 13.0 Motor Graders</td>
<td>Machine Operation Grade</td>
</tr>
<tr>
<td>Mar 11</td>
<td>T Operate SOC Motor grader simulator and PSU’s 160M motor grader</td>
<td>Study for Test</td>
</tr>
<tr>
<td>Mar 13</td>
<td>TH Test #2</td>
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<tr>
<td>Mar 17-21</td>
<td>SPRING BREAK</td>
<td>Participation grade</td>
</tr>
<tr>
<td>Mar 25</td>
<td>T Unit 14.0 Scrapers</td>
<td>Participation grade</td>
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<tr>
<td>Mar 26</td>
<td>TH Unit 15.0 Haul Trucks or Crosby Test</td>
<td>Scratch quiz or Crosby Test</td>
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<tr>
<td>Apr 1</td>
<td>T Unit 16.0 Dozer applications</td>
<td>Haul Truck or Scraper Quiz</td>
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<tr>
<td>Apr 3</td>
<td>TH Unit 20.0 Lifting Procedures &amp; Wire Ropes 190101b</td>
<td>Dozer quiz</td>
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<td>Apr 8</td>
<td>T Unit 20.0 Lifting Procedures &amp; Wire Ropes 190101b</td>
<td>Lifting quiz</td>
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<td>Apr 10</td>
<td>T Unit 21.0 Cranes</td>
<td>Lifting Quiz</td>
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<td>Apr 11</td>
<td>F INDUSTRY TOUR</td>
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<tr>
<td>Apr 15</td>
<td>T Unit 25.0 Telematics, or Compactors, or Crosby Test</td>
<td>Crane Quiz</td>
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<tr>
<td>Apr 17</td>
<td>TH Test #3</td>
<td>Study for Test</td>
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<tr>
<td>Apr 22</td>
<td>T Student Presentations</td>
<td>Participation Grade</td>
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<td>Apr 24</td>
<td>TH Student Presentations</td>
<td>Participation Grade</td>
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<td>Apr 29</td>
<td>T Student Presentations</td>
<td>Participation Grade</td>
</tr>
<tr>
<td>May 1</td>
<td>TH Student Presentations</td>
<td>Participation Grade</td>
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<tr>
<td>May 6</td>
<td>T FINAL EXAM May 6 at 4:00 pm</td>
<td>Study for Final</td>
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