

EPICS Fall 2007 Syllabus

Course website: <http://www.purdue.edu/epics/>

Course Guidance:

Staff Member	EPICS Position	Office (ARMS/EE)	Phone	E-mail
Pam Brown	<i>Program Coordinator</i>	ARMS 1207/ EE348A	49-40639	epics@purdue.edu
Carla B. Zoltowski	<i>Education Administrator</i>	ARMS 1209/ EE 348C	49-43559	cbz@purdue.edu
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Nick Felicelli	<i>Lab Manager</i>	ARMS 1210/ EE 337B	49-40629	epichelp@ecn.purdue.edu
William C. Oakes	<i>Director</i>	ARMS 1211/ ENAD 210	49-43892	oakes@purdue.edu

Address:

EPICS Program
Armstrong Hall of Engineering
701 W. Stadium Avenue
West Lafayette, IN 47907-2045

Advisors

Advisors are listed by team at <http://epics.ecn.purdue.edu/people/advisors.php>

TAs

A TA is assigned to each EPICS team; however, all TAs have office hours to work with students from any team. Collectively, they form a TA Consulting Pool from which any student or team is encouraged to seek expertise relevant to their project. A list of these areas and a schedule of current office hours can be found at <http://epics.ecn.purdue.edu/people/tas.php>.

EPICS TA Office

Room: ARMS 1130

Phone: 49-66017

Other EPICS Resources

Name	Position	Office	Phone	E-mail
Pamela Turner	<i>National High School Coordinator</i>	ARMS 1216	49-61889	plturner@purdue.edu
Natalie Kubat	<i>National Coordinator</i>	ARMS 1214	49-43750	nkubat@purdue.edu
Nancy Clement	<i>Entrepreneurship Program Coordinator</i>	MRGN 220C	49-49884	nic@purdue.edu

Course Description

EPICS is a service-learning design course in which teams of students from across campus work together on long-term projects that benefit the community. Project work centers around the engineering/technology/computing needs of a community partner, but typically interdisciplinary team interaction is an integral element for project success. Students may participate in EPICS multiple semesters and participation for multiple consecutive semesters on a project team is encouraged. Teams are composed of first year students through seniors.

Most EPICS projects last at least one-year, though partnership with the community organization continues for several years. Projects are intended to solve real problems, are defined in partnership with their community partners, and span the complete design process cycle [problem identification - specification development - conceptual design - detailed design - production - service/maintenance – retirement].

You receive academic credit (1 or 2 credit hours per semester) for participating in EPICS. How academic credits are applied to your major depends on your degree program and is determined by your department and/or advisor. See <http://epics.ecn.purdue.edu/prospectives/credit.php> for more information.

Course Outcomes:

- **Discipline Knowledge:** ability to apply material from their discipline to the design of community-based projects
- **Design Process:** an understanding of design as a start-to-finish process
- **Lifelong Learning:** an ability to identify and acquire new knowledge as a part of the problem-solving/design process
- **Customer Awareness:** an awareness of the customer
- **Teamwork:** an ability to function on multidisciplinary teams and an appreciation for the contributions from individuals from multiple disciplines
- **Communication:** an ability to communicate effectively with widely-varying backgrounds
- **Ethics :** an awareness of professional ethics and responsibility
- **Social Context:** an appreciation of the role that their discipline can play in social contexts

Grading

In EPICS, students work on teams and their final individual grade will reflect the quality and quantity of the student's documented **individual accomplishments** and **learning and skill development**, as well as the **team's accomplishments**.

All team members are responsible for the progress of the project. Teams will work together to identify team project goals for the semester. Individual roles and responsibilities within the team and projects will be identified and documented in the semester plan. In addition, individual students will identify goals and at the beginning of the semester within a number of the outcome areas. The Individual Memos will be used to document a student's individual learning and skill development and individual accomplishments (role(s) and project work) throughout the semester, and to propose modifications to the goals.

Formal assessment of the learning and accomplishments will be done at mid-semester, and then at the end of the semester for final grading. Evaluation will be based on the design notebook, lecture attendance, self assessment of learning and accomplishments, the formal project presentations and reports, and informal lab presentations and demonstrations. Senior design students will also be graded on their specific requirements. Input into the assessment decisions will be collected from the project partner, advisors, TAs, and the team members themselves. Each student will be asked to critique both his/her own participation in the project and that of all team members (peer evaluations).

The mid-semester assessment is a formative assessment intended to provide more detailed and cumulative feedback on the learning and accomplishments to date in the semester. General feedback will also be provided at Weeks 4 and 12 in response to the Individual Memo. Project documentation and team artifacts will also be assessed. The "Grading Summary" provides a summary of the assessments. Rubrics have been developed to both provide guidance to the students on what is expected from the different assessments, and to help advisors/TA and peers to assess the quality of the work. The rubrics help to distinguish Excellent (A), Good (B), Adequate (C), Marginal (D) and Unacceptable (F) work.

Time Requirements

Students on a given project will attend a common lab section, scheduled for two hours each week so teams have a common time to meet. Absences must be approved prior to lab, and unexcused absences will negatively impact the course grade. Additional meeting and work times are to be scheduled by the project team members.

Lecture is 50 minutes each week, but attendance requirements vary based on the number of credit hours you are registered for and if you are a new or returning student to EPICS. There are 5 required lectures for

new students, and two required lectures for returning students. Students enrolled for 1 credit hour must accumulate at least 5 lecture credits. Students taking two credit hours are required to have a semester total of 10 lecture credits. Students with a scheduling conflict with the Monday lecture of EPICS should notify their advisor or TA. A list of all scheduled lectures and more information about making up missed lectures can be found at <http://epics.ecn.purdue.edu/schedules/lectures.php> .

Skill Sessions that each count as a lecture will be held throughout the semester and are designed to teach specific skills useful to project progress and the development of outcome related skill sets. Scheduled skill sessions and attendance status will be posted in the myEPICS system. Students may also earn lecture/skill session credit by completing an Advisor Approved Activity form (found in “Forms & Guidelines”).

The typical expectations regarding time spent on EPICS are as follows. But like other courses on campus, you may need to spend more time than is typical to achieve a similar outcome:

- 2 credit hours= average 5 hours/week outside the lecture and lab on your EPICS project
- 1 credit hour= average 3.5 on your project for the 10 weeks when you don't attend lecture

Course Text:

Lima, Marybeth and Oakes, William. *Service-Learning: Engineering in Your Community*, Great Lakes Press, 2006. A limited number of copies are available on reserve in the Potter Library.

Semester Course Work

Templates, example documents, and guidelines for the following course documents can be found on the EPICS website at: EPICS at Purdue -> For Current Students -> Forms & Guidelines

In addition, consolidated schedules of the items below may be found at

<http://epics.ecn.purdue.edu/schedules/milestones.php>.

Bold= Project Task

Italics= Document Due

All Students:

- ***Individual memo's:*** In each individual memo, individuals should state personal learning goals for the semester and accomplishments appropriately, based on when in the semester they are submitted. A template and instructions will be provided on WebCT, where they will be due during weeks 4, 8, 12, and 15.
- ***Design notebooks:*** All students are required to maintain a *Design Notebook*. All activities related to the project, including individual efforts and ideas, relevant material and discussions from lecture, contacts, team sessions, and conversations and meetings with the project partner, are to be date-recorded or referenced in the notebook. Design notebooks are legal design documents, potentially used for patent purposes and must therefore be kept in ink. Notebooks will be turned in for review during weeks 4 (new students only), 8, and 15.
- ***Design Process Documents:*** There's a document pertinent to each phase of the design process. By semester's end, each project should have its own file in the team's folder on the Share Point Server. The file will contain updated documents through the completed design process stage. Design notebook documentation does not meet these requirements.

The stages and their respective documents are:

<u>Design Phase:</u>	<u>EPICS Document:</u>
1. Problem Identification	<i>Project Charter</i>
2. Specification Development	<i>Specification Document</i>
3. Conceptual Design	<i>Conceptual Design Report</i>
4. Detailed Design	<i>Detailed Design Report</i> (with prototype completion)
5. Production	<i>Delivery Checklist</i> (with final project completion)
	<i>Delivery Report</i> (with delivery)
6. Maintenance	<i>Fielded project report</i>

A more descriptive document about design process phases is available at <http://epics.ecn.purdue.edu/resources/EPICS%20Design%20Process.pdf>.

- **Outcome survey:** Individuals will complete an on-line outcome survey at the beginning and end of the semester.
- **Peer Evaluation:** For grading purposes, students will each complete an online evaluation of their team members at mid-semester and at the end of the semester. It will be completed on WebCT.
- **Reading and Reflection:** Individuals are to complete 5 readings and reflections during the semester. Reflections should be submitted to WebCT by the deadline stated on the schedule.

Senior Design Students:

- **Senior Design Project Proposal:** This must be completed during the first semester of Senior Design
- **Senior Design Project Description:** This must be completed during the second semester of Senior Design.
- **Documentation:** The senior design project and individual student outcomes must be documented carefully throughout the senior design experience.
- **Presentation to the Senior Design Committee:** All students using EPICS to fulfill their senior design requirement must present to the Senior Design Committee during both semesters of their two-semester EPICS Senior Design experience. First semester students present during Week 13; second semester students, during Week 9.
- **Senior Design Outcomes Matrix:** An index of how the course outcomes have been met over the year and where evidence for this mastery can be found (notebook, project documentation, etc.). It is also used by the advisor(s) and EPICS admin to approve the satisfaction of the course outcomes.

Teams:

- **Online Team Responsibilities:** This online form must be filled out during: week 1 for returning teams and week 5 for new teams.
- **Semester Plan:** Based on meeting the week 2-3 meeting with the project partner (using proposed plans), the team should finalize the *Semester plan*. It will provide reference for reporting progress made the rest of the semester
- **Project Proposal:** **New teams** must develop a Project Proposal to describe projects it will undertake, and is developed in consultation with the project partner. Written Project Proposals are due in lab in week 4
- **Delivery Review:** The delivery review will be held in conjunction with the Design Review for projects that are to be delivered this semester. A Delivery Checklist must be completed and returned by week 13.
- **Project Review:** The project review will be held in conjunction with the Design Review Presentations during week 12 for new teams or new projects.
- **Project Partner meetings:** One during weeks 2-3, and if the Project Partner did not attend the Design Review—one during week 13 to plan for the next semester using their feedback.

- **Formal project presentation:** All teams will make a formal presentation during exam week (week 16).
- **Web Archive:** Teams must maintain a webpage about past and current projects, as well as team members.

EPICS Project Work Locations:

Type	Room
EPICS Meeting Room	ARMS 1098B (accessible thru 1098 labs)
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EPICS Meeting Room	ARMS 1101
EPICS Computer Lab	ARMS 1095
EPICS Electronic & Computing Hardware & Project Prototyping labs	ARMS 1098
Temporary Project build space	PHYS B014
Entrepreneurship Initiative Lab (EEI) Labs	MRGN
Machine and Wood Shops	Will be available in ARMS beginning Fall 08

For a short period of time in Fall 2007, Phys B014 will be available for small electronics and project work, but it will eventually be phased out as soon as the labs in ARMS are functional. Projects kept there must be stored on the shelf in a medium sized container. If project materials get larger than that, we ask that you move that part to the ARMS lab.

Certain labs will be accessible on a key sign-out basis (checkout from the EPICS Program Coordinator) until PUID card access is implemented. The Lab Manager and TAs also have keys to the labs. The Meeting Rooms may be used for EPICS by students to meet with project group, etc., when they are not in use. Students will be required to read the Safety and Use Information and sign an agreement form to receive keys or card access to Armstrong.

All students and teams are responsible for keeping their project areas clean. EPICS students are expected to use the equipment in the labs in a responsible fashion. Abuse of the lab facilities may result in loss of access, a failing grade for the course, and/or formal disciplinary action.

Computer Accounts

Each EPICS student will need an ECN account to use the EPICS computer resources. All students enrolled in EPICS should have ECN accounts created for them but will still need to sign the ECN account form as an agreement on use of the account. If you added the course late or otherwise do not have an ECN account, stop by Nick's office to fill out a form to receive one.

Team Computing Resources

Each team has an email list serve. The format is: `epics-<team name>@ecn.purdue.edu` (e.g, the IMS team is epics-ims@ecn.purdue.edu)

The address for team home pages is `http://epics.ecn.purdue.edu/xxxxx`, where xxxxx is the team acronym. The team home pages are also linked to the main EPICS home page.

The Share Point Server is an online filing system used by large groups like EPICS to allow file access from any location with internet access. Each EPICS team has its own folder with access restricted to team members and EPICS staff. The SPS link is: <https://epics-deb.ecn.purdue.edu/layouts/1033/viewlsts.aspx>. In addition, students have access to their team's share drive (or T-drive), which is located at [\\epics.ecn.purdue.edu\xxxxx](http://epics.ecn.purdue.edu/xxxxx), where xxxxx is the team acronym. For more information on accessing your team's computing resources, see: <http://epics.ecn.purdue.edu/resources/access.php>.

Other Resources:

EPICS has a number of resources available to support your project work. Example resources: laptops, reference books, video cameras. Please see Nick Felicelli to check out these resources. For more information see: <http://epics.ecn.purdue.edu/resources/index.php> .

Terms to Know:

ARMS	The map abbreviation for the new Armstrong Hall of Engineering, the new location for the EPICS offices and labs.
Design Process	The process which any designer must go through in developing their design for problem solution. Many slight variations exist, although they have common elements. The EPICS Design Process consists of 6 phases: Problem Identification, Specification Development, Conceptual Design, Detailed Design, Production, & Maintenance.
Design Process Documentation	All information vital to the project which would allow any new project member to determine why the project was started, design decisions/reasoning along the way, what specifications and restrictions are imposed on the project--any information that would allow them to start where you left off or to completely recreate the project. Each phase of the EPICS design process has a report associated with it.
Electronic & Computing Hardware Lab	Formal name of part of the EPICS Lab in Armstrong (ARMS 1098).
EPICS	Engineering Projects In Community Service
ESAC	Person selected by the team to manage the influx of new members for the next semester.
Hardware Lab	The name used to refer to the project development/build space. The labs in Armstrong are officially titled the EPICS "Electronic & Computing Hardware & Project Prototyping labs," and have equipment and space for the physical construction of projects.
Individual MemoSee "Semester Course Work" section for more info.
I2P competition	Idea to Product competition that takes place in the spring
Lab/lecture	The "lab" portion of the EPICS course is the 2 hour block designated in student's schedule to meet together with the whole team and to work on their projects.
MIP	"Manager of Intellectual Property" selected by each team to manage team ideas in case of potential patentability. They also ensure that there is no copyright infringement and to make sure the structure of the Share Point Server is maintained.
myEPICS	An online tool allowing students to upload their Purdue schedules from SSINFO to determine common meeting times for project members. Videos of lectures, skill session possibilities, and other course resources may be posted there as well.
Online Outcome Survey (OOS)	This is a self evaluation filled out twice per semester to reflect on the accomplishments made on course outcomes. See "Semester Course Work" section for more info.
Outcome	One of the eight broad learning goals of the EPICS courses that students who successfully participate in the course over multiple semesters will have demonstrated.
Peer Evaluation	The peer evaluation allows students to assess themselves and their peers. It completed at mid-semester and at the end of the semester via WebCT. See "Semester Course Work" section for more info.
Project	An individual engineering/technology/computing need that an EPICS team hopes to meet.
Project Partner	A community organization that communicates an engineering need that a team is created to meet in continued coordination with the EPICS program and students.
Project Partner Liaison	Team member selected to be the main point of contact between the team and the project partner.
Project Prototyping Lab	Formal name of part of the EPICS Lab in Armstrong (ARMS 1098).

Role	Word used to describe one of the positions held by students on each team.
Senior Design	An intensive engineering design experience required of all senior engineering students to graduate. The EPICS coursework currently can fill this requirement for ECE and IDE students. See "Semester Course Work" section for more info.
Share Point Server (SPS)	An online filing system used by large groups like EPICS to allow file access from any location with internet access. Each EPICS team has its own folder with access restricted to team members and EPICS staff.
Skill session	A learning activity intended to help develop skills and knowledge needed for project work and related course outcomes.
Software Lab	This refers to the computer lab used by EPICS students. An ECN account is needed to log into the computers in the lab and in the meeting rooms.
SPS	See Share Point Server.
T-Drive	This is a shared hard drive space designated for the EPICS program. It may be used by mapping to any personal computer for use by EPICS students on campus. An ECN account is required to access the T-Drive.
Team	A group of people who partner with the same organization(s) & share a lab time (eg. SVAT, ODOS); the terms Project Team or sub-team are sometimes used to describe the group of people working together on a specific project.
Team Leader	Student team member selected lead the team.
Webmaster	Team member selected to post updated team member information and progress on the team website for the semester.