Project-Based Instruction

Project-Based Instruction (PBI) is the capstone course in the sequence of required education courses and is required before FSU-Teach students take Apprentice Teaching. PBI is the course in which the major themes of the FSU-Teach program—integrated content of mathematics and science learning, infusion of technology in representation, analysis, modeling, assessment and contextualization of the content, field-based experiences, and equity—converge into an exciting and intellectually challenging culminating experience. When students complete PBI, they are fully prepared for Apprentice Teaching.

Whereas in Classroom Interactions, students gain experience designing a sequence of several lessons that they teach to a high school class, in PBI, students design full units of connected lessons—a skill that is required in Apprentice Teaching. PBI also provides students with the experience of managing lessons and students outside a classroom, in a field setting.

Despite its name, PBI emphasizes choosing from a variety of appropriate teaching styles, depending on the type of material and the learning objectives, with project-based instruction being just one possible alternative. In addition, PBI requires students to incorporate various technologies into the units they plan.

Course Procedures: Project-Based Instruction

PBI has three essential components:

- **Theory-driven perspective:** Students learn about how people learn and how project-based instruction may be among our most informed classroom learning environments for bridging the gap between theory and practice.
- **PCK competence:** Technological and pedagogical content knowledge (PCK) competence assists FSU-Teach students in developing their own project-based units. FSU-Teach students gain this competence through reading and by observing a high school class that is structured on the project-based instruction method of teaching and recording their observations.
- **Field experiences:** A field component consists of two parts: observation of well-implemented project-based instruction in local schools and implementation of a mini project-based instruction unit with area high school students on a study trip to Port Aransas Marine Institute or locally in an astronomy project or research class.

A midterm paper ties together theory and field experiences. Students use online discussions, readings, class activities, and field experiences as the basis for discussing midterm questions. In lieu of the midterm paper, students may elect to participate in class discussions. There are six student-led class discussions of readings. Each student is responsible for leading one discussion as a member of a discussion leader team. All students are provided with focus questions—expanded subsets of midterm questions that are correlated to the readings. Students are required to submit focus question responses via email to the course instructor and discussion leaders. Discussion leaders summarize

student views and work to draw out key points during the discussion.

The PBI course teaches students how to write grant proposals to obtain materials and equipment they need to teach excellent lessons. Students also participate in a course project that involves preparing a unit suitable for use in a school setting. The unit includes an anchor video, benchmark lessons, investigations, calendar, objectives (mapped to state or national standards), project rationale, the theoretical basis for the project, concept map, assessment strategy, related resources, modifications for special needs students, and technological tools to assist in implementing the project.

Course Objectives: Project-Based Instruction

Students Will Be Able To:	**Evidence (Student Products)**
Discuss the importance of project-based instruction in terms of students' cognitive development, equity, and motivation	A project-based unit that includes a rationale and objectives A grant proposal to implement a project-based unit that includes a rationale and potential impact
Reflect on applications of educational theory as it relates to classroom practice in the area of inquiry-based instruction	Online discussions A grant proposal to implement an inquiry-based unit that includes a rationale and potential impact
Distinguish among project-based and other instructional approaches and decide which approach best fits instructional goals based on the benefits and limitations of each	Online discussions A project-based unit that includes benchmark lessons and an appropriate lesson sequence based on the best fit of different instructional approaches
Evaluate the usefulness of technology (e.g., concept mapping software, video editing software, the Internet, simulations) in achieving learning objectives and select appropriate resources for student use, based on the relationship of salient features of the technology to learning objectives	An annotated list of relevant resources and technological tools for a project-based unit Classroom presentation utilizing technology tools
Compare and contrast observations of "real" project-based classrooms with those presented in readings and with theoretical models	Online discussions of class readings and field observations of project-based classes

Critically analyze a lesson that they have taught and revise and re-teach it	Mini-lesson study that includes lesson plans, videotapes of the two lessons, reflections on what was planned, how the lesson went each time it was taught, and the rationale for the changes
Demonstrate skill in setting up and managing wet lab and field project-based environments	Assessment of videotape showing the student setting up and managing wet lab and field project-based environments
Work collaboratively to design a four- to six-week project-based unit for secondary math and/or science courses	A project-based unit consisting of a calendar, a rationale, objectives, a theoretical basis for the project, a concept map, benchmark lessons, investigations, alternative assessment strategies, related resources, and technological tools
For science students, read and discuss the Texas Safety Standards Manual (e.g., material safety data sheets, OSHA regulations, how to dispose of chemicals safely)	Participation in class discussion on safety and liability issues A project-based unit that includes safety precautions