

Course Syllabus – EDIT797
Revised August 2006

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Course Number and Title

EDIT797: Performance Based Design

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Textbooks

Required:

Dickelman, Gary (2003). *EPSS revisited: a lifecycle for developing performance-centered systems*. Silver Spring, MD: International Society for Performance Improvement ISBN 1890289-15-9 (available from www.ispi.org or www.amazon.com.)

Not required, but recommended:

Excerpts that are assigned during the course will be made available online and at no cost.

Cooper, Alan (1999). *The inmates are running the asylum: why high tech products drive us crazy and how to restore the sanity*. Indianapolis,IN: SAMS (ISBN: 0672316498)

Gery, Gloria (1991). *Electronic performance support systems: How and why to remake the workplace through strategic application of technology*. Tolland,MA: Gery Associates; ISBN: 0964622300.

Norman, Donald A. (1988). *The design of everyday things*. New York,NY: Doubleday ISBN: 0385267746 (Paperback re-issue March 1990)

_____ (1993). *Things that make us smart: defending human attributes in the age of the machine*. Reading, MA: Addison-Wesley Publishing Company

_____ (1998). *The invisible computer: why good products can fail, the personal computer is so complex and information appliances are the solution*. Cambridge, MA: MIT Press

_____ (2004). *Emotional Design: why we love (or hate) everyday things*. New York, NY: Basic Books: ISBN 0-465-05135-9

Rossett, Allison (1999). *First things fast: a handbook for performance analysis*. San Francisco, CA: Jossey-Bass/Pfeiffer; ISBN: 0787944386

Course Description

This course develops skills for evaluating, designing and creating performance-centered systems, including Job Performance Aids (JPAs), Electronic Performance Support Systems (EPSSs) and Workflow Learning tools. Generally, these are non-instructional devices that are used to help human workers overcome cognitive limits, complexity and other barriers that limit job performance. The course provides an overview of methods and tools related to prescribing, designing, implementing, evaluating and revising performance-centered systems. Students will analyze human performance problems then prototype, evaluate and propose revisions that result in performance-centered solutions.

EDIT797 is a practical introduction to the business imperative and development lifecycle for creating, implementing, and evaluating performance-centered systems. The course distinguishes the characteristics and development methods of performance-centered systems from those of data, human, user-centered and purely instructional systems. The course provides complete expositions and protocol for analysis, design, development, implementation, and evaluation of performance-centered systems within a dynamic, innovative and exciting real-world framework.

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How the Course Will Be Conducted

This is a graduate course attended by many working professionals with extraordinary demands on their time. Every effort will be made to be sensitive to such circumstances while upholding the highest standards of academic excellence. What does this mean? It means that learning and performance are the primary goals, and the means to achieve these goals includes patience and flexibility by students and instructors alike – by you and me alike. You are expected to do your best to complete assignments with excellence and to turn them in on time. But if circumstances warrant an assignment to be turned in late, then it is acceptable without penalty assuming that all ethical principles apply. The only deadline that I am held to in terms of your evaluation is the close of the semester. You must achieve the course objectives by the close of the semester to earn an acceptable grade. The rest are details that we can always work out.

Objectives: Upon completion of this course, participants will be able to:

1. Articulate and actively address the business imperative for performance-centered design (PCD);
2. Define performance-centered systems and distinguish them from data, human, learning and user-centered system;
3. Articulate attributes and behaviors of performance-centered systems and determine which are appropriate for specific real-world business (organizational) problems;
4. Analyze business performance gaps and determine how they can be filled with performance-centered system techniques;
5. Design, develop, and implement performance-centered systems and system components using PCD protocol;
6. Conduct performance-centered system evaluations; and
7. Use commercial software to create performance-centered system components.

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Learning Modes for the course include demonstrations, interactive discussions, on-line collaboration, asynchronous reviews, and cooperative learning.

Course Format: This course will be conducted as a graduate-level seminar and laboratory course. Participation in all learning events is expected; practical performance-centered system development work is mandatory to successfully achieve the course objectives. Participants will construct a knowledge base of readings, course notes, PCD protocol, and sample modules.

Evaluation: Course grades will be based on the following:

Interaction evaluation	50 points	Interactions are your contributions to online discussions and homework assignments other than the course paper and project. Further details are provided below.
PCD Project	300 points	The PCD Project is described below. You may work individually or in virtual teams.
Research paper	150 points	The Research Paper is described below and can support your PCD Project or cover a separate topic. The paper, too, may be an individual effort or it may be coauthored.
TOTAL	500 points	

How the Objectives Will Be Evaluated:

The objectives will be evaluated as follows:

1. Define, delineate, and describe the concepts stated in the objective through your class interactions (assignments and participation);
2. Elaborate on the concepts of the objectives in the research paper through application, discussion, and/or evaluation of PCD; and
3. Demonstrate your ability to apply the concepts of the objectives in your PCD project to a measurable performance outcome in some business or organizational context.

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Objective	Evaluation Criteria
1. Articulate and actively apply the business imperative for performance-centered design:	Throughout the course you must demonstrate that you approach performance problems from the perspective of their business imperatives. Besides merely stating the business imperative, it must be reflected in all aspects of the PCD lifecycle, starting with analysis. The business focus of each course component - your interactions (aka participation and assignments), research paper, and PCD project - are the means of evaluating mastery of this objective.
2. Define performance-centered systems and distinguish them from machine-, data-, human-, and user-centered system;	Mastery of this objective is demonstrated through analysis and design activities throughout the course. How you approach a performance problem and bridge performance gaps with proposed solutions demonstrate your understanding of the distinctions between the various types of systems listed in the objective. There are numerous opportunities - and requirements - to demonstrate mastery of this objective in each course component.
3. Articulate attributes and behaviors of performance-centered systems and determine which are appropriate for specific real-world business problems;	You must be able to list the primary attributes and behaviors of performance-centered systems and apply those that are appropriate to specific problems. Mastery is demonstrated via a minimalist approach to PCD ("just enough" attributes and behaviors to measurably fill the performance gaps).

Objective	Evaluation Criteria
4. Analyze business performance gaps and determine how they can be filled with performance-centered system techniques;	Mastery of analysis techniques must be reflected in each of the three primary components of PCD: Business Process, Human Diversity, and Information. Business gaps must be analyzed for all three components.
5. Design, develop, and implement performance-centered systems using PCD protocol;	The opportunities for actual implementation of a performance-centered system or component is likely not possible during the course, so you must at least address implementation via description and discussion in course interactions, the research paper, and implementation <i>planning</i> in your PCD project. On the other hand, design and development - according to the PCD lifecycle - must be clearly demonstrated in all three components of the course.
6. Conduct performance-centered system evaluations;	Mastery of this objective is demonstrated via reviews of existing systems (e.g., by visiting web sites and/or conducting contextual interviews) and reporting on them in your assignments. Evaluation can form the basis for your research paper and/or PCD project if you so choose. At the very least, you will conduct a real PCD evaluation as part of your PCD project.
7. Use a commercially available software package to create performance-centered system components.	There are a variety of PCD tools commercially available at no cost, for evaluation purposes. You will be made aware of them and will be required to use one or more in your assignments and PCD project. You may also use a tool that you have already acquired, if appropriate. Mastery is based on proper application of the tool to meet the performance need and satisfy design criteria.

Grading Criteria:

A: 450 – 500

B: 400 – 449

C: 300 – 399

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General Evaluation Criteria for PCD:

Evaluation is criterion-referenced. You must demonstrate mastery of PCD process, which means having the ability to develop a compelling business case and produce real-world systems, job aids, and components. You must demonstrate the ability to design and create systems and components that support business or organizational performance through human performance by exhibiting the following characteristics at a minimum:

- supports performers through best practices;
- establishes or aids in establishing goals;
- represents and facilitates the proper flow of work;
- minimizes cognitive burden (e.g., translation);
- provides access to supporting resources;
- manages knowledge; and
- stretches the PCD paradigm.

Interaction evaluation refers to the instructor’s evaluation of the quality of a student’s interactions during the semester, including on-line discussions, graded assignments, or other items designated specifically for evaluation.

Course Competencies

The competencies relevant to EDIT797 are shown in the table below. Included also are the six levels of cognitive functioning in Bloom’s taxonomy of educational objectives:

1. Knowledge: Remembering and recalling terms and facts.
2. Comprehension: Knowing what a message means.
3. Application: Transferring previously learned information to new settings.

4. Analysis: Disassembling the whole into parts.
5. Evaluation: Making judgments based on criteria and standards
6. Create: Putting elements together to form a novel, coherent whole or make an original product.

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1] Professional practice	Definitions	Bloom's taxonomy
1. Business/industry understanding	To identify how functional systems of organizations such as organizational strategies, structural elements, power/knowledge networks, financial position, and organizational cultures work independently and interdependently.	5, 6
2. Results-oriented practices	To differentiate means and ends, to establish measurable ends-oriented goals, and to employ various means that make changes and lead to desired end results.	4, 5, 6
3. Value-adding practices	To estimate, recommend and/or implement performance improvement interventions that are worthy to the performers, the organization itself and the society.	5, 6
4. Systems view	To take a holistic view of current practices and performance improvement situations and to recognize the interrelationships among various elements and events which are internal and/or external to the organization.	5
7. Project management	To plan, organize, monitor and facilitate the progress of performance improvement projects, to evaluate the outcomes and to make suggestions for subsequent actions.	3
8. Consulting	To analyze clients' needs, to assist them with their performance improvement projects and to provide them with quality services in the form of counsel, advice, review, design, development or evaluation.	4, 5, 6
[2] Analytical process	Definitions	Bloom's taxonomy
1. Analytic thinking	To break down complex performance improvement issues into meaningful and manageable components and to synthesize related components.	4, 5
2. Needs assessment and analysis	To determine the gap between actual and desired performance levels or identify performance improvement opportunities, and to identify and examine various factors that affect performance outcomes.	4, 5, 6
3. Data analysis	To interpret data obtained from various measurement and assessment methods and to apply this interpretation to decision-making processes.	4, 5
5. Observation	To identify and record what is happening in or across performance improvement situations.	2, 3
7. Systematic problem-solving	To select and apply step-by-step methods to solve performance problems and to maximize the effectiveness and efficiency of the interventions.	4, 5, 6
8. Cost-effectiveness analysis	To assess the relative value of the benefits of implementing performance improvement interventions over the costs for implementing them.	5
9. Evaluation of intervention outcomes	To assess and report the impact of performance improvement interventions against the organizational goals and strategic intent.	5
[3] Technical product	Definitions	Bloom's taxonomy
3. Writing skills	To prepare written materials by following rules of style and form generally accepted in the field, which are original, are appropriate for the audience, and accomplish the intended purpose.	3
4. Presentation skills	To design and effectively convey intended messages orally and using various presentation methods and media.	3, 5
6. Design of non-instructional interventions	To plan and formulate non-instructional objectives and strategies that facilitate desired performance outcomes.	5, 6
8. Development of non-instructional interventions	To construct and prepare non-instructional methods and strategies according to design specifications.	5, 6
10. Implementation of non-instructional interventions	To execute non-instructional interventions according to design specifications to produce desired performance outcomes.	5, 6
[4] Interpersonal communication	Definitions	Bloom's taxonomy
1. Buy-in & advocacy	To build ownership and support for performance improvement initiatives among stakeholders.	1, 2, 3
9. Social awareness	To explain various aspects of social contexts such as dynamic, political, economic and social interactions and their effects.	5

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Guidelines for the Research Paper: The research paper will be a reasonably scholarly work, consisting of 1500 – 4000 words, referencing the works of at least three (3) leaders from fields and practices that comprise PCD, prepared according to the standards of the program. The paper must address a relevant PCD issue in any or all categories *business performance*, *human performance*, *cognitive science*, and *technology infrastructure*. Note: Although not formally part of the course evaluation criteria, those papers that make sound contributions to the PCD literature will be considered for publication. You may co-author your papers with classmates, but in such cases the instructor needs to be clear on each author's contributions. *Note that your course paper may be in support of your course project (see below).*

Here are some topics for you to *consider* for the research paper (**but please do not restrict yourself to just these!**):

- Performance-centered design for systems that support customer service representatives (i.e., call center professionals who must retrieve on-line reference material relevant to the business domain and the customer's question while on the telephone talking with customers)
- Performance-centered systems design techniques for any specific vertical industry
- Supporting user workflow in transaction-based, data-centric systems
- Techniques for creating on-line representations of business tasks
- The proper use of metaphor in performance-centered systems
- The role of affordance in performance-centered design
- Designing performance-centered usability evaluations
- The role of knowledge management in PCD (...and/or vice-versa)
- Performance-centered design considerations for browser-based applications (e.g., how do they differ from conventional GUI development)
- Performance-centered design for highly dynamic work environments
- Techniques for providing alternate views of data, information, and knowledge in performance-centered systems
- The role of ontologies in PCD
- A survey of current technologies that foster any or all of the elements of the PCD lifecycle
- Performance-centered design issues for information appliances
- Designing passive constraints in performance-centered systems
- Employing reusable knowledge objects in performance-centered design
- Designing for human diversity in PCD
- Knowledge management and the semantic web.
- Organizational barriers to developing and implementing performance-centered systems
- Techniques for determining the appropriateness of PCD for business and human performance gaps in organizations
- Reachability of hypermedia (data, knowledge, information, reference) content in performance-centered systems
- The use of visual displays in performance-centered systems
- The roles of media types in PCD
- Quantitative and qualitative returns on investment for PCD
- Integrating systems through semantic web services.

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Authors to consider for resources:

Ashok Banerji	Jonathan Grudin	Steven Pinker
Alan Cooper	Larry Constantine	Marc Rosenberg
Donald Norman	Lucy Lockwood	Ara Shirinian
Roger Shank	Geoffrey Moore	Erik Dickelman
Duane Degler	Tom Landauer	Leonard Schlain
Gary Dickelman	John Casti	Duncan J. Watts
Lisa Battle	Edward Tufte	Peter G. W. Keen
Jakob Nielsen	Allison Rossett	Kathleen Sindell

Brenda Laurel
Gloria Gery

Barry Raybould
Stan Malcolm

Len Weinreich
Thomas Passin

...and, of course, check out the Books and Articles sections of www.epsscentral.info.

Guidelines for the PCD Projects

By engaging PCD principles to create critical performance-centered system components in the course projects, the student must demonstrate abilities in key phases of the performance-centered systems development lifecycle (analysis, design, development, implementation, and evaluation). Students may work in groups and submit projects as a group. Group projects must have prior approval. The main criterion for group projects is that each group member's contribution is well-defined. Your projects will be presented online to the instructor and peer evaluator(s) just prior to the conclusion of the course. *Note that your course paper may be in support of your project.*

Suggestion: Pick a performance problem where improvement is achievable and measurable. Don't try to boil the ocean.

Examples of past project:

- Improving Business Performance in an Inbound Call Center
- The Design of Everyday Stoves: The Evolution of Performance-Centered Kitchens
- Performance-centered community of practiced for graduate students
- Mi Computadora – Interface design to improve skills for non-English speakers
- Performance Support for The Online Academy (collaboration for Northern Virginia School District)
- Task-Mapping Database Redesign
- Inventory-ease: a technology inventory system for schools
- Redesigning the Motion Magic Interface (physics concepts for students with learning disabilities)
- Literacy Explorer (performance support for lay reading facilitators and their students)
- Credit Union Knowledge Management System
- Performance-Centered Design for Comcast University
- 4th Space Operations Squadron – DOUZ Communications Operations

Format for the Project Proposal

You must submit a project proposal for acceptance before starting work on your project. **All categories A – G must be addressed in the proposal.**

A. Project Name

B. Project Objective

What do you intend to show, prove, or develop?

Which elements of the PCD process are the focus of the project? What is the purpose, who is the customer, and what is critical to success?

C. Project Deliverable

Is the result going to be a working system? - a prototype? - a design specification? - an evaluation? Be specific!

D. Project Team

Are you going to work alone or in a group? If the latter, who are the members and what roles will each person play? Roles must be clearly delineated and measurable.

E. Business Problem and Business Needs

State the business performance problem (or organizational performance problem if not related to business) addressed by your project. This should be a real problem that has measurable performance gaps - in business/organization and human terms. State specifically how you expect the PCD activities to contribute to filling the performance gaps.

F. Project Plan Outline

Delineate how your project will proceed from its onset to its conclusion. How will you measure progress (i.e., what are the interim deliverables and what are the review and approval processes)? When will you

engage each element or sub-element of the PCD process? How? If yours is a team project, what are the roles and responsibilities of each team member with respect to the project tasks and outcomes?

G. Presentation Proposal

How will you present your results to your instructor and your peers for evaluation? Who will do what (if a team)? What would be the suggested evaluation criteria to fairly assess your accomplishments?

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Student Evaluations of the Course

Toward the end of the course you will be asked to fill out a course evaluation. You are **required** to respond to this evaluation. Course/instructor evaluations are required by the University and are used to improve courses/instruction, to make personnel decisions, and for accreditation purposes.

Policy on Plagiarism

Cheating and plagiarism are at odds with all academic goals and will not be tolerated in any form. All work submitted by a student must represent that student's own ideas and effort; when the work does not, the student is being dishonest. Plagiarism occurs when a person passes in another person's work as his or her own or borrows directly from another person's work without proper documentation or attribution.

Policy on Disability Needs

As part of George Mason University's continuing commitment to upholding the letter and spirit of the laws that ensure equal treatment of people with disabilities, the university established and maintains the Disability Resource Center. Under the administration of University Life, the center implements and coordinates reasonable accommodations and disability-related services that afford equal access to university programs and activities.

The Disability Resource Center is available to serve all students with disabilities, including those with cognitive (e.g., learning, psychological, and closed head injury), sensory, mobility, and other physical impairments. See <http://www.gmu.edu/student/drc/>.

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