



Drexel University

PhD in Applied Creativity and Innovation

**Program Proposal
DRAFT**

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Preface

Drexel University's Goodwin College of Professional Studies carries forth Drexel's reputation as one of the nation's best doctoral universities with this application for a Ph.D. program in *Applied Creativity and Innovation*. The proposed program is designed to enable and support the rigorous research of creativity and innovation as applied across diverse professional disciplines, with the purposes of broadening literature in the field, further developing candidates' credentials and expertise in a broad spectrum of career fields, and upholding the university's mission to provide comprehensive education that serves societal needs. The program is interdisciplinary in its design and content, pragmatic in its applications, and built upon two guiding principles: 1) creativity and innovation are defining characteristics of successful individuals and organizations, and 2) through a course of study, individual creativity can be learned and enhanced.

As one of the nation's leading engineering, science and business universities Drexel is an ideal setting for a Ph.D. in *Applied Creativity and Innovation*. Drexel has a long tradition of leadership in innovation through its outstanding engineering, science and information technology programs. Today, Drexel is in a period of unprecedented growth, expansion, and academic excellence. It has recently established a new medical school, tripled freshman enrollment while tightening its admission requirements, and is applying for permission to open the first new law school in Pennsylvania in 25 years. The Ph.D. in *Applied Creativity and Innovation* embodies both the Drexel tradition and its future direction. The program offers a research-focused terminal degree for graduate students interested in conducting scholarly work devoted to understanding the processes of creativity and innovation that can be formalized and applied to any field of study or professional discipline.

Over the last decade Drexel has established itself as a focal point for creativity studies in the United States. Three Drexel doctoral candidates have been awarded the American Creativity Association's (ACA) E. Paul Torrance Graduate Student Research Award, including 2005 winner Patrick Auth, Director of Drexel's Physicians' Assistant program. Drexel recently hosted a panel discussion that brought experts together from education, the military, technology, and government to discuss the central role of creativity and innovation in their fields. The principal designer of the proposed Ph.D. program, Fredricka Reisman, Ph.D., is a leading researcher in the field of creativity who has co-authored three pre-college mathematics textbooks (*Learning Mathematics Creatively*) with world-renowned creativity scholar E. Paul Torrance. Dr. Reisman was awarded the ACA's Champion of Creativity award in 2002 and is the director of the Drexel/Torrance Center for Creative Studies, which sponsors a speaker series that features the world's foremost researchers in the field of creativity. On November 17th, Yale University's Robert Sternberg, a leading scholar and researcher in the field of creativity, will be a guest speaker of the Drexel/Torrance Center.

The proposed Ph.D. program is sparking interest from faculty across Drexel and from prospective students in diverse fields such as health professions, business

management, the creative arts, K-12 education, and legal studies. It is in this context of a tradition of innovation, academic excellence and dedication to the study and promotion of creativity that Drexel seeks approval for its proposed Ph.D. program in *Applied Creativity and Innovation*.

A. Philosophy/Purpose/Objectives

Mission of the Institution

Over the past several years, Drexel has made impressive progress in increasing enrollment, attracting strong external support, and strengthening its finances. The University is building on its traditional strengths of an urban location, technological focus, co-operative education programs, and committed and dedicated faculty who are active in teaching as well as in scholarship and research. Drexel pioneered the distribution of personal computers to its entire incoming freshman in the 1980s; the offering of the renowned Drexel Engineering Curriculum, which became a model to numerous universities nationwide, in the 1990s; and “the wireless campus,” enabling electronic access in all of its classrooms, laboratories, and the central library, in the early 2000s. In developing and expanding these and other strengths, the University positioned itself for excellence in education for the 21st century.

Several key accomplishments have occurred over the past decade alone, all of which strengthened Drexel’s finances and its position as an important academic institution, serving well the Commonwealth and the mid-Atlantic region. The most pronounced accomplishments are: 1) tripling freshman enrollment and the corresponding increase of full-time undergraduate student enrollment by more than 80 percent; 2) quadrupling the application rate while increasing the academic standards for incoming students, thus increasing the selectivity rate; 3) introducing several important academic initiatives across the university and within all colleges and schools; 4) quintupling the endowment and improving its performance; 5) increasing, by nearly 50 percent, the number of tenure-track faculty; 7) improving facilities and completing new construction, adding more than 200,000 square feet of classrooms and research laboratory space; and 8) reducing the dependence on student tuition revenues.

Drexel has also responded to changes in its needs and those of society by creating new schools and colleges. In the past decade, it has created three. The School of Education, founded by Dr. Reisman, was created to give special attention to the societal need for more, and better trained, educators. The School of Biomedical Engineering, Science and Health Systems was created to be a “college without departments,” in which science, health science, physics, and engineering students and scholars could collaborate without organizational impediment. Most recently, the Pennoni Honors College was created to serve the needs of increasing numbers of academically accomplished students and also to administer intercollegiate academic programs serving all Drexel undergraduates, including a University writing program, study abroad and international

fellowships, the Center for Civic Engagement, and the Great Works Symposia. In addition, Drexel has applied to the Pennsylvania Department of Education to award the Juris Doctor and other degrees. If approved, the school will begin in fall 2006 and will be the first new law school in Pennsylvania in 25 years.

In one of its most ambitious initiatives, Drexel University acquired the MCP Hahnemann University in July 2002 and obtained three schools in the health sciences – medicine, nursing and health professions, and public health. This acquisition provides enormous possibilities for academic synergies in areas such as engineering and sciences integrated with the medical sciences, in the health care delivery system, in the business and management of health care, and in government regulations related to health care, all of which are made available to our students and faculty. New access to major fields of employment and research has been opened. That promise and potential have fueled a substantial growth in the size and quality of our undergraduate population, especially in the Colleges of Engineering, Arts and Sciences, and Business. Numerous new research initiatives in engineering and science have opened important new professional opportunities to our graduate students. The College of Medicine, in close cooperation with the School of Biomedical Engineering and the College of Engineering, is attracting significant new research funding to Drexel.

At their meeting in December 2003, the Trustees of Drexel University adopted a strategic plan for the University that was called “A Time of Transforming Opportunity.” Culminating a year of reflection, it confirmed that Drexel was at a point in its development where it was ready, and able, to establish itself as one of the nation’s best doctoral universities and position itself for success in the coming decades. The plan included a new mission statement to fit the 21st century:

To serve its students and society through a comprehensive, integrated academic program enhanced by technology, cooperative education, clinical practice, and professional internships.

Goals and Objectives of Proposed Program

In an environment of strategic growth and a renewed dedication to academic excellence – from a new medical college, to dramatic increases in student enrollment and the number of tenure-track faculty, to a proposed new law school – Drexel University’s Goodwin College of Professional Studies is positioned to provide its first doctoral degree program, the Ph.D. in *Applied Creativity and Innovation*. This degree is unique to Goodwin and does not overlap with any other degree programs in the university, while it draws from university wide faculty interest in affiliating with this initiative.

The design of the proposed Ph.D. reflects the spirit of Drexel’s strategic plan and its goals are two fold: 1) promote scholarly inquiry into the study, development, and evaluation of applications of creativity and innovation in individuals and organizations;

and 2) enhance an individual's ability to imagine new ideas by learning how to envision that which cannot be immediately seen.

Program Goals and University Mission

The Ph.D. in *Applied Creativity and Innovation* augments Drexel University's mission to "serve its students and society through an integrated, comprehensive academic program" by offering a terminal degree that supports and enables research in an emerging field of study relevant to many disciplines both inside and outside of the university setting. Specifically, the program will serve as a seedbed for the formalization and implementation of methods to enhance creativity and innovation to produce significant positive results – on both organizational and individual levels – in productivity, efficiency, problem solving, competitiveness, and ingenuity. This vision for the proposed program augments Drexel's mission to serve society through a dedication to innovation and learning that will have positive and practical impacts on the lives of people in local, national and global communities.

Relationship with Existing Drexel Programs

The Ph.D. in *Applied Creativity and Innovation* is interdisciplinary in its applications, with creativity and innovation at its core. Within Drexel, faculty from across the university have expressed willingness to affiliate with the program with development of discipline tracks within the proposed program, or, with Drexel programs such as Mechanical Engineering, incorporating the core courses as a certificate within their own Ph.D. program. The result is true, university-wide integration of this program with no overlap with other Ph.D.'s. At the same time, the degree provides doctoral research and terminal degree options where they currently do not exist in the College of Media Arts and Design, in the Physicians' Assistant and Art Therapy programs in the College of Nursing and Health Professions, and in selected humanities departments in the College of Arts and Sciences. Additionally, the new Drexel law school that is currently being reviewed for approval by the PA Department of Education plans to offer a dual J.D./Ph.D. degree in law and applied creativity and innovation.

Because of the interdisciplinary design of the Ph.D. in *Applied Creativity and Innovation*, dozens of Drexel undergraduate programs, as precursors to master's degrees, can serve as pathways to it. In addition, with the implementation of the new Ph.D. and the group of creativity researchers the program will bring with it to Drexel, program designers expect an expansion of activities (such as seminars and guest lectures) from the Drexel/Torrance Center for Creative Studies that will serve to enhance Drexel undergraduate studies. Furthermore, the Drexel/Torrance Center is currently considering local chapter affiliation with the national organization of the American Creativity Association. With a local chapter of the ACA at Drexel, undergraduates interested in the study of applied creativity and innovation will have a local forum and resource to expand their learning while having highly supported access to a national network of creativity researchers and scholars.

Institution Internal Approval Process

The approval process for the proposed Ph.D. in *Applied Creativity and Innovation* begins with a review of the program proposal by the Curriculum Committee of Drexel's Goodwin College of Professional Studies. With revisions and approval from the Goodwin Curriculum Committee, the program proposal is then reviewed by the Senate Committee of Academic Affairs (SCAA) of Drexel's Faculty Senate. With revisions and approval from the Drexel SCAA, the proposal is then reviewed and voted upon for approval by the full Drexel Faculty Senate.

B. Need and Demand

Evidence of Student Interest

Drexel recently conducted an e-mail survey gauging interest and demand for the proposed Ph.D. in *Applied Creativity and Innovation*. The survey was distributed on June 3, 2005 to students enrolled in Drexel School of Education graduate courses and members of the American Creativity Association. Thirty-nine respondents to the survey indicated that they are very interested in the program, and 34 said they were very interested in applying to it. Program designers anticipate that a minimum of 10 students each year will be needed for a viable program (please see below, page 12. For detailed responses from the Drexel survey, please see **Tab A.**)

Labor Market Needs and Demands – National

On a national level, designers of the proposed program recognize a strong need in the United States for a research-driven Ph.D. program focused on the study of applied creativity and innovation. The proposed program arrives in the context of a rapidly transforming global socioeconomic landscape where technological innovation and manufacturing automation has placed an even higher premium on brainpower over muscle power. For instance, while manufacturing jobs have dropped in the U.S. by 11 percent in recent years, they have dropped by 15 percent in China and 20 percent in Brazil during the same period. Globally, manufacturing jobs have dropped by 11 percent since 1995 – the same rate of decrease as in the U.S since the mid-1990s. This data is convincing evidence of the impact of technological innovation on manufacturing employment throughout the global economy, and goes far to dispel commonly held beliefs that manufacturing job losses in the U.S. lead to corresponding net job gains in emerging economies that have comparatively inexpensive labor costs (Drezner, 2004). Similarly, traditional service-sector employment in information technology, financial services, document management, customer care and other process- and repetition-intensive jobs are being sent overseas to nations like India in greater numbers; but even

these losses are relatively small in comparison to the overall U.S. job market, and many suggest that outsourcing some service jobs benefits the U.S. workforce and economy as a whole (Drezner, 2004).

Attempting to stem the flow of manufacturing and service sector jobs out of the U.S. in the short-term overlooks the more significant long-term challenge to the U.S. economy (and the robustness of its workforce) in maintaining its edge in innovation – from automobile and software design to business administration to mathematics and biotechnology research. Creativity and innovation has historically been one of the nation’s great economic strengths and there is growing evidence that the country is losing some of its brightest, most creative minds to countries more ready and willing to foster them (Florida, 2005).

Creativity and innovation are the strategic tools that allow us to overcome the many difficulties in preparing for the future with any efficacy. In *The New Division of Labor: How Computers are Creating the Next Job Market*, the authors (Levy & Murnane, 2004) argue that computers are:

...better at deriving solutions than people when the problems can be described in a rules-based logic that provides a procedure for any imaginable contingency. What a rules-based system cannot do, however, is deal with new problems that come up, problems unanticipated by the program of rules; that is to say, problems of the future. Most importantly, computers cannot capture the remarkable store of how-to or tacit knowledge that we all use daily but would have a lot of trouble articulating.

As Levy and Murnane (2004) put it, "In the absence of predictability, the number of contingencies explodes as does the knowledge required to deal with them." As smarter and faster computers increasingly replace service-oriented jobs, the most creative problem solvers will emerge as leaders. The chief export of post-industrial economies such as United States therefore will be the creativity and innovation of its companies and organizations, government agencies, and academic centers. The nation is moving from the information age to the conceptual age (Pink, 2005) and workers and organizations that can continuously innovate and apply principles of creativity to their work will be in the best position to succeed (Pink, 2005).

The following lists offer a sampling of companies that carry the job positions of either “chief innovation officer” or “chief creative officer.” The lists were compiled through research on the Lexis/Nexis and Google news information search engines and are not to be considered exhaustive, i.e. the designers of the Ph.D. in *Applied Creativity and Innovation* expect that the total number of job positions with either the title “chief innovation officer” or “chief creative officer” to be significantly larger than the number offered here. Rather, these lists demonstrate the importance and emphasis placed on applied creativity and innovation by companies throughout the world representing a diverse group of industries. Advertising and graphic design agencies were excluded from the list of companies that hold a job position of chief creative officer, as that particular position title is commonly used throughout these industries. However, the principles of

applied creativity and innovation are certainly relevant to the advertising and graphic arts industries, and the designers of the Drexel program expect professionals from these fields to enroll in the Ph.D. program.

Chief Innovation Officers

1. PepsiCo (NYSE: PEP) – beverages, food
2. Textron (NYSE: TXT) – aerospace and defense
3. Humana (NYSE: HUM) – healthcare
4. Computer Sciences Corporation (NYSE: CSC) – information technology
5. BF Goodrich (NYSE: GR) – aerospace and defense
6. Grub & Ellis Company – commercial real estate
7. Mitsubishi Corporation – auto manufacturers
8. Alegent Health – healthcare
9. Taiwan Semiconductor Manufacturing Company – semiconductor manufacturing
10. Coca-Cola (NYSE: CCE) – beverages, food
11. Publicis Group Media (NYSE: PUB) – advertising
12. WPP Group (Nasdaq: WPPGY) – advertising
13. MusicStrands – audio technology
14. Health Sciences Center – healthcare consulting
15. HealthDialog – healthcare
16. Hitachi (NYSE: HIT/TSE) – electronics

Chief Creative Officers

1. Ford Motor Company (NYSE: F) – auto manufacturers
2. Walt Disney Company (NYSE: DIS) – entertainment
3. Electronic Arts (Nasdaq: ERTS) – multimedia & graphics software
4. Time Warner (NYSE: TWX) – entertainment
5. Kmart (Nasdaq: SHLD) – department stores
6. Warnaco (Nasdaq: WNRC) – apparel
7. John Wieland Homes – home builders
8. Atari (Nasdaq: ATAR) – interactive entertainment
9. Victoria's Secret – apparel
10. Apago, Inc. – technology

Labor Market Needs and Demands – Regional

The designers of the proposed program anticipate applicants holding master's degrees from diverse academic areas. Because any master's degree can serve as the foundation for this Ph.D., and the principles of applied creativity and innovation are relevant and beneficial to any professional discipline, regional employment opportunities for program candidates will be determined by several factors, chief of which will be the candidates research area and/or professional experience. However, when considering graduates from the program as potential instructors and researchers within colleges and universities, Drexel's location in Philadelphia is very conducive to employment

opportunities. The Philadelphia metropolitan area is home to over 50 colleges and universities. As Ph.D. degree holders, graduates of the program will have the opportunity to develop their own applied creativity and innovation program tracks in Philadelphia area colleges and universities, or, develop course work that focuses on creativity and innovation for existing program areas relevant to their research/academic background (business administration, math, health, arts and sciences, etc.).

Philadelphia is also a national center for the biotechnology and pharmaceutical industries and a center for regional healthcare. In 2003, 53,500 workers in the Greater Philadelphia region were directly employed by these life sciences industries. Only the Greater New York region employs more people in life sciences. An additional 310,000 workers – or about 13 percent of the total Philadelphia region workforce – are employed in life sciences-supporting industries, such as hospitals and medical schools (Loyd, 2005). Corporations, organizations and research institutions within these highly competitive industries maintain slight edges in their marketplace through the innovation and creativity of their employees. Graduates from the Ph.D. program in *Applied Creativity and Innovation* with professional and/or academic experience in health sciences, biotechnology, chemistry, business administration and other related fields will be in a strong position, through their research and knowledge in applying principles of creative problem solving and other formalized processes of innovation, to gain employment in strategic positions among Philadelphia's life sciences employers.

Program designers also anticipate program applicants that hold master's degrees in Education to be accepted into the Ph.D. in *Applied Creativity and Innovation*. The Philadelphia/Southern New Jersey metropolitan area is the fourth largest in the United States, with the School District of Philadelphia representing the nation's seventh largest school district by enrollment. In holding doctoral degrees on top of their master's in education, it is anticipated that these program graduates will have ample job opportunities within the region for either strategic administrative/curriculum design posts or as classroom teachers.

Growth and Change in the Professional Field

In addition to socioeconomic changes, strong forces are reshaping the academic learning experience, especially at the doctoral level. There are growing gaps between the intentions and assumptions of faculty, the actual experiences of students, and the demands of the workplace (AAC&U, 2002). These gaps are a function of (i) changes in faculty career pathways as well as faculty roles and responsibilities; (ii) changes in the demographics of the student body and patterns of enrollment and participation in graduate education; and (iii) changes both in the campus experience and the workplace. In light of these forces, Drexel's proposed Ph.D. in *Applied Creativity and Innovation* reconsiders: who teaches and how they teach, who learns and how they learn, and how our graduates can best utilize the insights within themselves and their respective disciplines.

The model for these deliberations is *The Engineer of 2020: Visions of Engineering in the New Century*, a report from the National Academy of Engineering published in 2004 that poses the question whether:

it serves the nation well to permit the engineering profession and engineering education to lag technology and society . . . Rather, should the engineering profession anticipate needed advances and prepare for a future where it will provide more benefit to civilization? (p. 1.)

The report reflects the necessity of fully utilizing the engineering community's collective creativity to adapt to the unprecedented changes occurring in a rapidly evolving human existence, e.g., extended life span, previously unimaginable ways of communicating, ever shorter product development cycles, new sciences, newly emerging world powers, and the increasing threat of terrorism worldwide (*The Engineer of 2020*, p. 1, 2004). The conclusions drawn from study are applicable to fields beyond engineering and those existing structures of higher education that support the development of their talent pools. Drexel's new Provost Stephen Director will provide the academic leadership to support both the recommendations of the report's findings and a new Ph.D. program that focuses on research into the application of creative and innovative thinking in the field of higher education. Provost Director is the Chair of the National Committee on Engineering Education as well as Project Liaison for *The Engineer of 2020*, and therefore is in a unique position to provide leadership in this endeavor.

Increasingly, capacities such as cognitive flexibility, knowledge transfers, and adaptability – the core characteristics of creativity – are emerging as the new basic skills of an educated generation. In its recent report (2003), The Business-Higher Education Forum urges higher education to adopt new approaches to learning with emphasis on: leadership, teamwork, problem solving, time management, self-management, adaptability, analytical thinking, global consciousness, and strong communication skills. The message is clear – it matters not only what we know but also how we know it, how we use what we know, how we work with others who have different expertise than our own, and how well we respond to unexpected challenges that we encounter (AAC&U, 2002).

Uniqueness of Program and Attractiveness of Online Instruction

Program designers of the Ph.D. in *Applied Creativity and Innovation* intend to offer online course work for the program to provide optimal flexibility for candidates. Because the program is unique in its design and curriculum (this is the first and only doctorate of philosophy program in the U.S. with an interdisciplinary approach to the research of applied creativity and innovation) program designers expect interest from potential students from across the U.S. In a recent survey of American Creativity Association members (see Tab A), respondents from Texas, Michigan and New York expressed strong interest in applying to the program if instruction was offered online.

Asynchronous online instruction will help students to pursue career objectives while working towards a doctorate.

Program designers also anticipate a cohort learning structure for the Ph.D. in *Applied Creativity and Innovation*. The cohort structure has proven to be highly effective in other Drexel programs that employ online instruction (e.g. teacher education) through its emphasis and support of student collaboration. And, as stated above in this program proposal, for current Drexel master's degree candidates in areas of study such as graphic design, art therapy, physician's assistant, law, and others, the proposed Ph.D. program offers a unique opportunity to expand research interests while earning a terminal, advanced degree.

Student Enrollment Projections

- *Number of students required for viable program:* 10
- *Maximum number of students to be accommodated:* 16 (on campus); 20 (online)
- *Student Market/Schedule:* With classroom and online learning options, students are expected to be drawn from across the Philadelphia region and all 50 states. In the tradition of Goodwin College of Professional Studies, the program is to be designed for part time evening students.

Benefits to the Commonwealth

The Commonwealth of Pennsylvania is an ideal and expected setting for the nation's first Ph.D. in *Applied Creativity and Innovation*. Philadelphia's Benjamin Franklin epitomized the ideals of the proposed Ph.D. program: a self-made person who relied on his creativity and entrepreneurial spirit to build a fulfilling, successful life and contribute to the well being of his fellow citizen. In the 19th century, Pennsylvania's next generation of creative thinkers followed Franklin's example by developing major industries in coal, oil and steel, while Philadelphia served as a national center for commerce, fine arts, architecture and medicine. Today, Pennsylvania continues as a major U.S. manufacturing hub and the Commonwealth has carried on its tradition of creativity and innovation by emerging as a national leader in the biotechnology and life sciences industries. Drexel's proposed Ph.D. in *Applied Creativity and Innovation* parallels Governor Rendell's current initiative, the *Keystone Innovation Starter Kit*, by focusing on research universities for the development of a world-class Commonwealth workforce that will meet the needs of employers in advanced technology sectors such as life sciences, advanced manufacturing and information technology. One of the central visions of the Ph.D. program designers is to establish Philadelphia and the Commonwealth as a national center for the study of applied creativity and innovation through which researchers and business leaders can learn how the various processes of creativity and innovation can be understood and applied systematically.

C. Program Structure

Authors of the program structure for the proposed PhD acknowledge the work of the National Research Council committee that produced the report *Scientific Research in Education* (NRC, 2002).

Calls for education research training programs that embody interdisciplinary approaches are occurring (e.g. Eisenhart & DeHaan, 2005), and a number of guiding “assertions” define the development of student researchers (Schoenfeld, 1999). First, researchers need to guard against the dangers of narrow compartmentalization, but they must also avoid superficiality. Second, researchers must gain a deep understanding of the nature of evidence and truth-claims, and learn how to identify and frame meaningful problems. Third, core courses should engage beginning researchers with major education issues and provide opportunities for students to gain differing perspectives on these issues and become proficient in a wide range of methods for addressing them. And fourth, students should have opportunities to engage in research and become steeped in research culture as early as possible in their careers.

1. Goals

The goals of the proposed program are twofold:

1. promote scholarly inquiry into the study, development, and evaluation of applications of creativity and innovation in individuals and organizations;
2. enhance an individual’s ability to imagine new ideas by learning how to envision that which cannot be immediately seen.

The design of the proposed program will reflect these goals for learning, how we approach the curriculum, and how we shape the student experience, resulting in: the convergence of the disciplines with a blurring of disciplinary boundaries and the emergence of integrative fields; the growth of multidisciplinary interest in applications of creativity and innovation; the availability of deeper understandings of how people learn; and the capacity to model dynamic systems.

2. Objectives/Outcomes

The program objectives/outcomes will comprise the following that reflect the recommendations of the report entitled *Scientific Research in Education* (NRC, 2002, p. 3):

- Pose significant questions that can be investigated empirically
- Link research to relevant theory
- Use methods that permit direct investigation of the question
- Provide an explicit and coherent chain of reasoning
- Replicate and generalize across studies

- Make research public to encourage professional scrutiny and critique

The main principle behind the proposed creativity degree is that students build their own theories, supported with appropriate tools and resources, and that they test these theories constantly through practice and reflection and in so doing become more effective researchers or practitioners. To illustrate, here is an example of a core component of the program:

Creative Thinking is distinguished from Critical Thinking. The process of creative thinking is often, mistakenly, intertwined with critical thinking. There is a tendency to write and edit simultaneously, couple hypothesis generation and evaluation, combine problem identification with solution. To increase effectiveness, students will first apply creative thought, which is meant to be daring, uninhibited, free-spirited, imaginative, unpredictable, and revolutionary in order to maximize the size and richness of the idea pool (brainstorming). Second, critical thinking is exercised to achieve applied creativity. This is reductive, logical, focused, conservative, practical and feasible. During this stage, the idea pool is reduced to achievable, appropriate ideas. Maximizing the size and richness of the idea pool is a conscious process that has a lot in common with a) DeBono's lateral thinking and b) the elicitation of tacit knowledge. It is the pre-critical thinking phase and some elements include: a) coming up with ideas for the sake of generating ideas, b) using a variety of stimuli and frameworks to open up as many pathways as possible, c) not stopping when a goal seems fulfilled, and d) consciously stimulating change in direction. Thus, a key principle is "produce first and scrutinize second" – e.g. writing and rewriting are two separate processes. This applies across the board, from business problem solving to the arts. The more people try to understand meaning while they are in the process of production, the less prolific and, ultimately, the less creative they are.

Upon completion of the core courses students will have:

1. formed an understanding of creativity oriented theories of learning and teaching, creative and innovation management, enhanced communication, creativity and problem solving and how these may be applied to practical situations;
2. developed the ability to reflect critically on existing practices and express coherent and cogent ideas and arguments about applied creativity and innovation;
3. gained experience of conducting small-scale research and using technology in support of independent study culminating in the dissertation.

DRAFT

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Course Work Flow Chart – Please see **Tab B** of this proposal for a flow chart that illustrates course work sequence, methods of instruction, maximum period of candidacy and other program requirements

Timeline – Ph.D. in *Applied Creativity and Innovation*

Course	Credits	Benchmark	Time
CREA 801: Creativity and Innovation Theories	4		Fall quarter 1
CREA 800: Seminar*	1		Fall quarter 1
CREA 802: Examination of Assessment & Research Methods of Creative and Innovative Thinking	4		Winter quarter 1
CREA 804: Basic Research Design	3		Winter quarter 1
CREA 800: Seminar*	1		Winter quarter 1
CREA 803: Techniques for enhancing creativity and innovation	4		Spring quarter 1
CREA 805: Intermediate Research	3		Spring quarter 1
CREA 800: Seminar*	1		Spring quarter 1
CREA 806: Six Sigma Methodology	4		Summer quarter 1
CREA 807: Proposal and Literature Review Writing	3		Summer quarter 1
CREA 800: Seminar	1		Summer quarter 1
CREA 800: Seminar	1	Pass Qualifying Exam	Fall quarter 2
CREA 799: Proposal	2	Develop Dissertation Study Proposal	Fall quarter 2
CREA 800: Seminar	1	Proposal approved by Core Dissertation Committee and IRB/ Pass proposal orals	Winter quarter 2
CREA 800: Seminar	1	Complete Pilot Study	Spring quarter 2
CREA 999: Dissertation**	11***	Pass dissertation defense	Ongoing to completion
<p>*Continuous enrollment commencing Fall quarter 1 with Advisor/Chair ** Continuous enrollment with Chair upon completion of pilot study until dissertation defense is passed *** The remaining 11 dissertation credits may count toward the minimum 45 credit program requirement</p>			

3. Credit Structure Overview and Course Descriptions

The Ph.D. degree in *Applied Creativity and Innovation* requires 45-quarter credits beyond a master's degree earned in any field of study. The total of 45-quarter credits is based on Drexel's standard of course credit requirements for all of its Ph.D. programs. Under Drexel academic guidelines each three-credit course requires 28.5 hours of supervised instruction; and each four-credit course requires 38 hours of supervised instruction. All three- and four-credit courses in the proposed Ph.D. in *Applied Creativity and Innovation* will include at least 40 hours of supervised instruction. Drexel's academic calendars have been adjusted for the next 5 years to make sure that Monday holidays don't throw the university out of compliance with its instructional guidelines.

Of the 45 credits of the program, 24 credits correspond to the seven core courses, which are mandatory for every student enrolled in the program. The core courses present the foundations of applied creativity and innovation to students with diverse backgrounds by covering aspects of: creativity theories; assessment of creative thinking; techniques such as role play, simulation, sensing social situations, problem identification and solution strategies; quantitative and qualitative research design including mixed methodology applied to creativity and innovation investigations; and integration of an interactive technology system as a vehicle for learning and communicating ideas.

Upon completion of the core courses, the student will take the qualifying examination based upon the core courses up to but not including CREA 806: Pilot Study. During the CREA 806: Pilot Study course, the student will consult with his or her advisor to select advanced graduate level elective courses to enhance the content knowledge in the discipline of their master's degree while being conscious of applying knowledge of creativity and innovation acquired in the core courses. The program will follow a cohort design whereby all students will move through the core courses in sequence together including the Qualifying Exam and Pilot Study course.

In addition to the 21 credits of core courses, there are 24 credits of electives that will be selected under advisement with the student's dissertation committee chair, depending on the master's degree content knowledge (electives are selected for the purpose of applying creativity to the student's discipline – depending upon advisement, up to 15 of these credits may apply to the dissertation).

Overview: Credit Requirement Structure

Core courses (3 @ 4 credits, 4 @ 3 credits)	24 quarter credits
Elective courses and dissertation	21 quarter credits

(Of these 21 quarter credits of electives, 15 quarter credits may be used towards dissertation work).

Core Courses

(Course syllabi are available for review in **Tab C** of this proposal)

i. **CREA 801: Creativity theories** (4 credits) The course begins with the concept of creativity and a history of research on creativity. The theories investigated are Guilford's Structure-of-the-Intellect model, Catell's primary abilities theory, Gardner's theory of multiple intelligences, Sternberg and Lubart's Investment Theory, implicit theories espoused by Sternberg, Amabile's motivation theory, Csikszentmihalyi's systems approach, and analysis of the theory of creativity both as a generalized attribute and a domain-specific attribute.

ii. **CREA 802: Assessment of creative and innovative thinking** (4 credits) This course will focus on methods for studying creativity and innovation. Included are psychometric approaches to the study of human creativity, experimental studies, the case study method, and systems approach for understanding unique creative people (biographical methods), biological methodologies, computational methodologies, and creativity from a historiometric perspective.

iii. **CREA 803: Techniques for enhancing creativity and innovation** (4 credits) including problem solving, role play, simulation, sensing social situations, problem identification and solution strategies. Case studies of innovative start up companies and training approaches (e.g., Eureka Ranch) will require an active learning pedagogy including creative team building and team problem solving/creativity. Another enhancer will involve integration of technology as a vehicle for learning and communicating ideas. QLinX Software Systems, Inc., an expert in the design and development of artificial intelligence Web-based robots (or "bots"), will serve as an example of innovation in the technological field.

iv. **CREA 804: Quantitative and qualitative creativity research design I** (3 credits) Includes introduction to mixed methodology applied to creativity and innovation research. Will incorporate a multivariate paradigm. Introductory concepts of the Six Sigma methodology will be included as well as qualitative creativity research design. 3 credits

v. **CREA 805: Quantitative and qualitative creativity research design II** (3 credits) Includes models for categorical data, multilevel data, and latent variables with emphasis on factor analysis as well as advanced work in qualitative research.

vi. **CREA 806: Six Sigma methodology.** (4 credits) Six Sigma is a successful breakthrough management tool – a fact-based, data driven methodology that can be applied to any field. Six Sigma methodology has been widely adopted by organizations since its creation by Motorola in the 1980's and popularization by General Electric in the 1990's. The fundamental objective of the methodology is the implementation of a measurement-based strategy that focuses on process improvement and variation reduction. This Six Sigma methodology course examines elements of complex systems and will provide students with methods and tools for evaluating any process or operation.

The course will challenge students to create environments in which the best solution to a particular challenge is applied using a rigorous analytical methodology, focusing on creative and innovative decision making processes and problem solving. The course provides students with a comprehensive approach to continuous quality improvement and best practices in identifying and solving quality problems. Students will have an insight in advanced tools and problem solving techniques, and critical skills for leadership in an enterprise-wide deployment that is field specific.

vi. **CREA 807: Proposal and Literature Review Direction** (3 credits) This is the culminating core course in the program and prepares students for CREA 799: Proposal, where the dissertation proposal is finalized in concert with the Committee Chair and relevant Committee members. This is a benchmark juncture of the Ph.D. progress, as the attrition rate for ABD students is often cited as 50%; that is, they complete coursework, pass the qualifying exam, and never complete their dissertation, which marks the transition from student to scholar. Thus, emphasis will be on further developing research, writing, and thinking skills drawing from prerequisite coursework.

CREA 800: Ph.D. seminar. (1 credit) Taken with the students' Committee Chair, this ongoing quarterly experience comprises members across cohorts up to passing the dissertation defense. Course foci include clarifying and refining theories and methodologies, provides a venue for refining research questions, allows sharing of information, facilitates student bonding and team building.

Elective Courses for various disciplines are under Development (e.g., Sport Management, Applied Engineering Technology (AET), Learning K – 8 Mathematics Creatively, Remotely Operated Laboratories, ...)

4. General Requirements

Below is a summary of requirements for obtaining this Ph.D. degree.

1. A G.R.E. score of at least a 4.5 in the analytical section and a combined score of 1100 in the verbal and quantitative sections. GRE scores at or above the 70% level are considered favorable for admission.
2. A total of 45 graduate quarter credits post MS and completion of a Doctoral Dissertation are required in order to attain a Ph.D. degree. Beyond the core courses, the curriculum is tailored according to the interest of the student.
3. The student must develop a plan of study with her/his research advisor's/advisors' approval.
4. The Ph.D. Candidacy Examination must take place after the student has completed his/her core course work, but no later than one full academic year before the student's thesis defense occurs.

5. Upon passing the Candidacy Examination, the student is classified as a Ph.D. Candidate.
6. Following the successful completion of the Candidacy Exam, the student is required to have a thesis proposal presentation. To this end, the candidate will select a committee of at least three tenured or tenure-track Drexel faculty; at least one must be from outside the student's discipline. An additional two might be external to Drexel, i.e., are affiliated with another university or relevant professional field.
7. According to the new University Policy, Ph.D. candidates must maintain continuous registration by registering for a minimum of 1 credit for fall, winter, and spring quarters until all doctoral degree requirements are completed.
8. The Candidacy Examination and Dissertation defense are open to all faculty members and students although only appointed committee members vote to pass/fail the student.

D. Administrative Structure

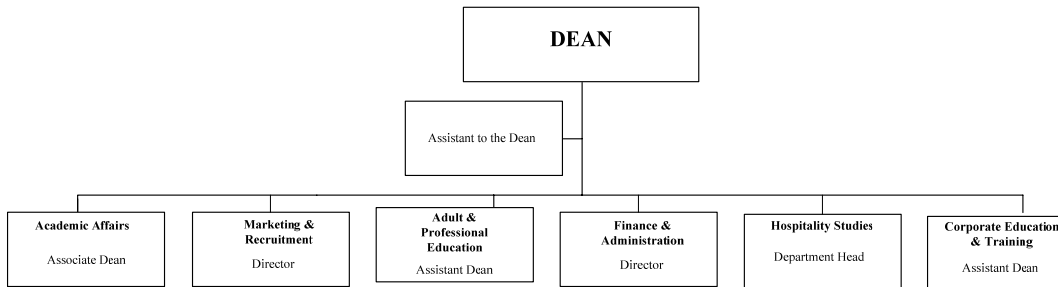
The Goodwin College of Professional Studies consists of the department of Hospitality Studies and five divisions: Academic Affairs, Adult & Professional Education, Corporate Education & Training, Marketing & Recruitment, and Finance & Administration. As is the case for all full-time academic programs, the proposed Ph.D. in *Applied Creativity and Innovation* will be housed within the division of Academic Affairs, which is under the supervision of the Associate Dean. This division will be in charge of monitoring the academic progress of the program, as well as of recruiting the necessary faculty from within and outside Drexel. As indicated in the organizational chart in the next page, the Dean is responsible for the administration and management of the day-to-day operation of the College, and is supported by one associate dean, two assistant deans, and a department head, in addition to the directors of finance and marketing. The College has currently in operation a Curriculum Committee, which is responsible for overseeing all academic programs offered by the college. This committee is also responsible for approving new courses and programs prior to their submission to the university's Faculty Senate. In addition to the proposed Ph.D. program, the college is in the process of absorbing the full administration of the Masters degree in Emergency Management Services from Drexel's College of Nursing. Consequently, a new Curriculum Committee for Graduate Programs will be formed as the body in charge of overseeing course creation, modification, and delivery of graduate programs, including the approval of instructional faculty.

E. Resources

1. Faculty and Staff

The Goodwin College of Professional Studies has a faculty body of 17 full-time individuals with backgrounds spanning as diverse fields as engineering, technology, sport management, hospitality studies, education, communications, and sociology. In addition, program managers, coordinators and academic advisors, support the faculty by providing a full range of student services, academic support and mentorship. The following offers a chart of the organization of administrative officers for the college.

Goodwin College of Professional Studies



While the proposed Ph.D. in *Applied Creativity and Innovation* will count on the support of the aforementioned human resources, the more specific and immediate support to the program (and corresponding cost) will include the following:

- | | |
|---|----------------------------|
| ▪ Research assistants (2@ \$15,600) | \$31,200 |
| ▪ Adjunct instructors (5@ \$3,400) | \$17,000 |
| ▪ Drexel affiliate faculty (3@ \$3,400) | \$10,200 |
| ▪ Program Advisors | Goodwin position is posted |

The research assistants are doctoral students supported by the college in terms of stipend and by the University through tuition remission. These are individuals with a demonstrated record of excellence in academic performance and dedication to educational endeavors.

The college has an adjunct faculty body close to 400 in all disciplines offered by the university. The program will draw from this pool, as well as from other individuals inside and outside the university who already have indicated commitment to participate in the new major.

The Drexel affiliate faculty refers to those full-time faculty members in academic units outside Goodwin College who are participating in the development and delivery of the proposed major. Goodwin College has been a leader in the academic advising of both traditional and adult learners.

The academic advisor is responsible for the mechanics of providing general information, course registration assistance, and any other needs students may encounter during the course of their studies.

Dr. Fredricka Reisman will be the initial director of the *Applied Creativity and Innovation* program. Dr. Reisman is a leading researcher in the field of creativity who has co-authored with world-renowned creativity scholar E. Paul Torrance three pre-college mathematics textbooks titled *Learning Mathematics Creatively*. She is on the board of the American Creativity Association (ACA) and was awarded the ACA Champion of Creativity award in 2002. In addition, she is the director of the Drexel/Torrance Center for Creative Studies, which sponsors a speaker series that features the world's foremost researchers in the field of creativity.

In addition to the existing Drexel faculty, the college will recruit on an as need basis faculty from institutions in the nation and abroad. These individuals will be affiliated with the college as scholars in residence, research professors and/or visiting professors, depending on the length of their tenure and nature of their involvement in the program.

2. Physical Facilities, Instructional Equipment and Labs

The Goodwin College of Professional Studies is housed in One Drexel Plaza, 3001 Market Street, across from the 30th Street Train Station in Philadelphia. This facility, designed to provide convenient and effective access for students, includes one-stop student services including admission, registration, financial aid, and academic advising. The college provides students with access to seven state-of-the-art computer laboratories, equipped with advanced and updated software, desktop publishing and scanner capabilities. Additional resources include a state-of-the-art teleconferencing/smart room and PLC, electronics, robotics, and machine tools educational laboratories to support the technology programs.

By means of the aforementioned facilities, courses within the program will be offered both in the traditional face-to-face mode of delivery as well as in a distance learning mode, through asynchronous web-based courses, and real time videoconferencing lectures. Students with background and/or interest on engineering and/or technology disciplines will be able to integrate applied creativity and innovation foundations with experiential activities in laboratory environments as those mentioned above. No additional facilities will be required to implement the proposed program.

3. Library

Current holdings in the Drexel Libraries catalog number approximately 590,000. Over 9,000 of these are books in the Education classification range (L). Over 3,100 items are classified for Psychology (BF) in the Main Campus library and the two Health Sciences libraries. As an interdisciplinary study, variations on the term "creative" appear in the descriptions of over 1150 items in the library catalog. Additionally, the Library subscribes to electronic databases covering the scholarly research literature that include over 12,500 journal titles, approximately 650 of which are journals in psychology (in databases such as PsycInfo) and over 600 journals in the field of education (in databases such as ERIC, Education Periodicals, and others). Patents and intellectual property databases are also available, such as Lexis Nexis, USPTO Web Patent Database and U.S. Patents Citation Database from Community of Science. The Library's reference collection currently contains specialized resources such as "The Encyclopedia of Creativity," and "The International Encyclopedia of Social and Behavioral Science" among other titles, and the subject specialist librarians for Education and Psychology would acquire additional resources to support this area.

Cooperative arrangements with other institutions for resources to support the proposed Ph.D. program include:

- Inter-Library Loan arrangements whereby Drexel students are eligible to borrow books from the lending collections of the fifty participating academic libraries in the PALCI network (<http://www.lehigh.edu/~inpalci/>)
- Library use and walk-in borrowing privileges are available for graduate students at the University of Pennsylvania Libraries, one of the top ranked academic library systems in the country, three blocks from Drexel.
- Drexel Libraries' consortium purchasing agreements through the regional library network PALINET.org and the Commonwealth of Pennsylvania's Access PA Network help get best prices on a wide variety of new resources, such as databases and electronic

F. Finances

1. Program Budget Projections

Ph.D. in *Applied Creativity & Innovation*
 Goodwin College of Professional Studies
Budget Planning and Analysis in Constant Dollar

Study Year	Year 1	Year 2	Year 3	Year 4	
1st Year	15	15	15	15	
2nd Year		14	14	14	
3rd Year			13	13	
4th year				12	
Total FTE	15	29	42	54	
	Summer	Fall	Winter	Spring	Total
1st Year		5	8	8	21
2nd Year	8	3	1	1	13
3rd Year	1	3	2	2	8
4th year		1	1	1	3
Total Credits					45

Estimated Tuition Rate per Credit Hour (5% increase of AY05)
 General fee - Annual \$210

	Year 1	Year 2	Year 3	Year 4	4 Yr Total
Tuition	252,000	397,600	480,800	509,600	1,640,000
Fee	12,600	24,360	35,280	45,360	117,600
Total Revenue	264,600	421,960	516,080	554,960	1,757,600

	Year 1	Year 2	Year 3	Year 4	4 Yr Total
FT Faculty Count	3	3	3	3	
TT Faculty	170,000	170,000	240,000	240,000	820,000
Auxiliary Faculty	80,000	80,000		-	160,000
Adjunct @ 3,000/course	6,000	7,500	9,000	12,000	34,500
Overload @ 3,000/course	6,000	7,500	9,000	12,000	34,500
Summer Salary	5,000	5,000	10,000	10,000	30,000
2 RA @ \$15,600	31,200	31,200	31,200	31,200	124,800

Fringe Benefit	84,030	84,638	83,645	84,860	337,173
Marketing and Recruitment	10,000	10,000	10,000	10,000	40,000
Consulting Services	5,000	5,500	6,050	6,655	23,205
Tuition Remission	35,280	22,480	14,480	6,480	78,720
Research Travel	5,000	5,000	5,000	5,000	20,000
Equipment & Software	6,000	6,000	6,000	6,000	24,000
Other Operating Expenses	5,000	5,500	6,600	7,920	25,020
Total Expenses	448,510	440,318	430,975	432,115	1,751,918

Net Contribution	(183,910)	(18,358)	85,105	122,845	5,683
Margin	-69.50%	-4.35%	16.49%	22.14%	0.32%

2. University Financial Statements

Audited Drexel financial statement for past five years will be submitted to the PDE as part of the full program proposal, pending Drexel internal approval.

G. Evaluation

Evaluation is seen as the process of providing information about a program, activity, service or policy to be evaluated to assist decision-making. An effective evaluation includes a systematic process and provides actionable items based on evidence. An evaluation can be applied at different stages of the program life cycle for program planning, process improvement and impact assessment. The evaluation design for the proposed Ph.D. in *Applied Creativity and Innovation* will allow for the examination of the achievement, experiences and demographics of program candidates.

Innovative Evaluation Program

A comprehensive ongoing program evaluation will comprise both quantitative and qualitative data collection supported by a unique Web-based interactive evaluation robot, named EVA (standing for EVAuation) that will support the program evaluation process. All program participants (students, instructors, advisors) will be connected for ongoing communication and evaluation through the project evaluation system called QLinX, a system developed by experts in the field of education for online research project communication and evaluation utilizing user-friendly student tested user interfaces and computational intelligence techniques. Successful outcomes from this program will include increased interest in and knowledge of applications in the fields of creativity and innovation evidenced by focus groups, surveys, on-line interactive assessment, interviews, performance-based assessment of course activities, and student and instructor surveys.

The QLinX evaluation is designed to produce rich quantitative and qualitative data utilizing objective and appropriate Ph.D. in *Applied Creativity and Innovation* performance indicators and measures. The performance outcomes, measures, and benchmarks articulated in the Evaluation Grid will serve as a foundation for several other indicators and measures that will be distributed to program participants quarterly using a highly interactive evaluation software system available over the internet. This innovative artificial intelligence-based software system was developed by the members of the QLinX evaluation team, led by David Schwartz, CEO; Ira M. Schwartz, Provost for Temple University and QLinX Chairman; and Dr. Paul McDermott, professor at the University of Pennsylvania, Graduate School of Education.

The QLinX evaluation system will serve as an online tool to connect all program participants in a highly engaging and innovative manner, for the purpose of distributing critical evaluation data to the evaluation team and principal investigators routinely with

near real time functionality. The system will track program participants as they move toward achieving their intended outcomes, allowing researchers the opportunity to periodically assess aggregate and individual performance data as well as other valuable feedback from the field.

The QLinX evaluation system will be configured to include the over-arching Program goals, outcomes and measures stated in the Evaluation Plan/Grid (continuously collecting and distributing this information), as well as several other indicators and measures that will assist in the evaluation. Both formative and summative evaluation reports will be made available to the Program Director for distribution to program faculty and where appropriate, students. “Eva” is the QLinX platform for evaluation information capture and dissemination. Eva is an artificial intelligence-based interactive software system, and is in the process of being customized for the Ph.D. Program evaluation (e.g., training the software to ask Program participants to evaluate their experiences in the program on a periodic basis).

QLinX evaluation activities will fall under three macro categories of work: software system preparation/customization, data collection, and data dissemination/analysis.

Phase I. Evaluation System Preparation & Customization

In the first phase of work, the QLinX evaluation programming team prepares the evaluation software to manage a menu of appropriate project outcomes and performance measures. In Phase I the following system preparation steps are followed:

- 1) Identify appropriate measures including surveys from Program materials and robust literature review.
- 2) Develop Program graphical user interfaces, incorporating specific outcomes and measures.
- 3) Program/modify database to manage project-specific outcomes and measures (e.g., all measures/surveys and corresponding answers must be programmed into the system prior to initial data collection activities).
- 4) Test application measures and surveys.
- 5) Test database.
- 6) Test graphical user interfaces.
- 7) Design and test evaluation reports as well as online communication tools and random reporting protocols.

The programming in the first phase is labor intensive and focused on customizing the evaluation software so that it can rapidly be used in the field for collecting valuable Program participant progress in a distributed manner. Extensive database testing and customization is a key to ensuring the success of the evaluation.

Phase II. Ongoing Data Collection Activities

In this phase, the evaluation system has been customized according to the program evaluation specifications, and is activated to interview Program participants. The data collection process can be broken down into three steps:

- 1) **Training** – this locality development activity involves the planned training of the entire Program population at all levels of participation to ensure that they are comfortable with, and ready to use the Program QLinX evaluation system. Most participants are interested and comfortable with the system immediately and are attracted to the simple, fun, and conversational nature of the software interface. The QLinX evaluation team, in addition to any site-level help they are given from peers and colleagues experienced with the evaluation software system will provide any subsequent training to new Program participants personally.

QLinX will train the following PhD program participants:

1. Students – One 15-20 minute group session per student during orientation, with sessions scheduled throughout the year depending on program needs. Individual training sessions over the phone if needed. Most doctoral level students will be able to interact with the Eva system without training.
 2. Faculty – Individual training sessions in person, shouldn't take longer than 15 minutes for the introduction to Eva. Faculty will be encouraged to develop customized Eva system reports and supportive information dissemination processes.
- 2) **Data capture** – this follows immediately after careful face-to-face training. Program participants will access the QLinX evaluation system over the Internet, and will be emailed/given the URL as a part of the training process.
 - 3) **Quality assurance** – in addition to facilitating training and data capture processes for the Program participants, QLinX provides ongoing quality assurance engineering services at the database level to ensure all project information is stored properly before it is disseminated to the evaluation team, Program Director and faculty, grant-making agencies, and other designated partners.

Phase III. Data Dissemination & Analysis

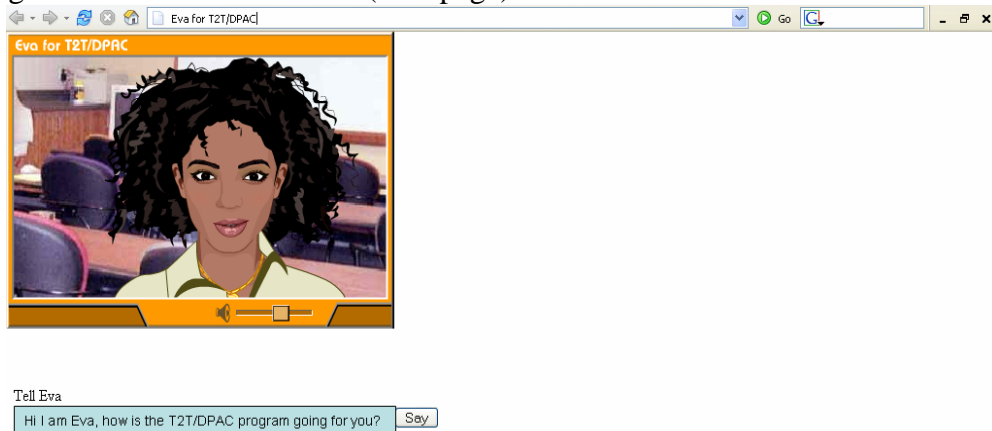
The final phase of QLinX evaluation activities, data dissemination and analysis, is a continuous process that allows evaluators, Program Director and faculty, and all other approved interested parties, immediate access to data flowing in from the program sites.

The Eva system communicates with each of the program participants over the Internet on an ongoing basis, and the captured data is immediately available for research, planning,

and informed action. For example, Eva can be trained to ask content-specific questions and deliver the answers to instructors, evaluators, program administrators, etc. The system allows for both formative and summative evaluation. On a periodic basis the PhD program administrators and evaluators will be able, for example, to simultaneously look at aggregate program data and randomly selected groups of student/Eva interactions for planning, evaluation, quality assurance, etc. The Eva system allows for continuous structured communication with students. In addition to capturing and disseminating data, Qlinx specializes in data mining technology -- Qlinx develops data mining technology for IBM. Eva system data will be available to faculty, program administration, and other involved researchers for the rapid development of data mining models/experiments.

The following figure is an actual screenshot from the online Eva T2T/DPAC evaluation system (Dr. Reisman's Transition to Teaching grant):

Figure 1. Eva for T2T/DPAC (next page)



As is planned for the Ph.D. Program, critical evaluation information is directly collected from T2T/DPAC participants through the graphical user interface (Figure 1.), and is immediately available in the database. The information in the database can be instantly analyzed by the QLinx evaluation team, principal investigators, and other designated parties. Quantitative and qualitative data gleaned from program participants on an ongoing basis is immediately sorted and stored according to the following criteria:

- Date start time
- End time

- Time between answers
- Name or unique number (optional)
- Internet IP address
- Number of measures/questions answered

The Program Director and faculty, for example, have the ability to look at all data logs collected, or a random selection of surveys/conversations generated by the QLinX evaluation system Eva. Additionally, they can develop new measures and Likert-type scales for Eva, which can stimulate new information available for program improvement (formative evaluation). As stated earlier, both formative and summative evaluation reports will be made available to the Project Director for distribution to other program participants. The QLinX evaluation team will analyze the project data personally as it comes in on an ongoing basis, and make reports available on a timely and periodic basis formally and informally to serve the needs of this important project.

Multiple Program Level Evaluation

Evaluation will be conducted on multiple program levels: the effectiveness of the curriculum and the instruction, the awareness of creativity and innovation thinking, and the overall program outcomes with respect to program impact, personal improvement, organizational change factors, implementation, and institutionalization. Both formative and summative evaluation reports will be made available to the Program Director and Graduate Committee for purposes of program improvement.

The following Evaluation Grid delineates project outcomes, data: types/when collected, methods/instruments, data analysis, benchmarks, and who is responsible for implementing and overseeing the particular evaluation component. Following is the framework for evaluating the program outcomes that emerged from the two project goals; namely:

1. promote scholarly inquiry into the study, development, and evaluation of applications of creativity and innovation in individuals and organizations,
2. enhance an individual’s ability to imagine new ideas by learning how to envision that which cannot be immediately seen.

Evaluation Grid for Project Outcomes

Project Outcomes	Data: Types/When Collected	Methods/ Instruments	Data Analysis	Benchmarks	Who Responsible
1. Pose significant	Research questions generated by	Student generated research questions	Content analysis	100% of program students will	Program faculty

questions that can be investigated empirically	program students/ During core courses	online via project evaluation system (QLinx). Quizzes Projects	Three scores	generate possible research questions. 100% will form understanding of creativity oriented theories of learning and teaching, creative and innovation management, enhanced communication, creativity and problem solving and how these may be applied to practical situations.	QLINX Dissertation Committee Chair
2. Link research to relevant theory	Research connections to creativity theory generated by program students / During core courses	Library study and seminar and course discussions/Course examinations and performance assessments Qualifying exam/Upon satisfactory completion (grade of at least B) of core courses	Content analysis	100% of students will integrate research and theory 80% of students will pass qualifying exam on first try (may retake one time and pass to remain in program). 100% will develop the ability to reflect critically on existing practices and express coherent and cogent ideas and arguments about applied creativity and innovation.	Program faculty Program Director
3. Use methods that permit direct investigation of the question	Dissertation Proposal/ Upon satisfactory completion of Qualifying Exam	Dissertation Proposal	Content analysis	80% of students will pass Proposal oral exam on first try (may rewrite at discretion of Chair with input from Committee and Program	Dissertation Committee Chair Program Director

				Director to remain in program). 100% will gain experience of conducting small-scale research and using technology in support of independent study culminating in the dissertation.	
4. Provide an explicit and coherent chain of reasoning	Dissertation Proposal/ Upon satisfactory completion of Qualifying Exam	Literature Review Rationale for study Performance in oral exam on proposal	Content analysis	80% of students will pass Proposal oral exam on first try (may rewrite at discretion of Chair with input from Committee and Program Director to remain in program)	Dissertation Committee Chair Program Director
5 Replicate and generalize across studies	Dissertation/Upon satisfactory completion of Proposal Exam	Dissertation study/Dissertation Dissertation orals	Reviews of Chapter 4 (Methodology) Content analysis of entire Dissertation	95% of students will pass Dissertation oral exam on first try (may retake once at discretion of Chair with input from Committee and Program Director to remain in program)	Dissertation Committee Chair
6. Make research public to encourage professional scrutiny and critique	Publication and presentations at professional conferences/Ongoing	Submission summaries/QLINX evaluation system	Journal reviews for acceptance Conference presentation reviews for acceptance	80% of program graduates will either present at a professional conference or publish in a refereed outlet within three years after graduating from the program	QLINX Chair

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DRAFT

July 18, 2005

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TAB A – Survey Measuring Interest in Program

Ph.D. in *Applied Creativity and Innovation* – Program Interest and Demand

Results from e-mail survey measuring interest and demand for Drexel University’s proposed Ph.D. in *Applied Creativity and Innovation*. The survey was distributed on June 3, 2005 to students enrolled in graduate education courses at Drexel and members of the American Creativity Association.

Responses

Survey Question	1	2	3	4
1. Does the proposed Drexel PhD in Applied Creativity and interest you?	41	9	3	2
2. Would you be interested in applying to the program?	35	10	7	3

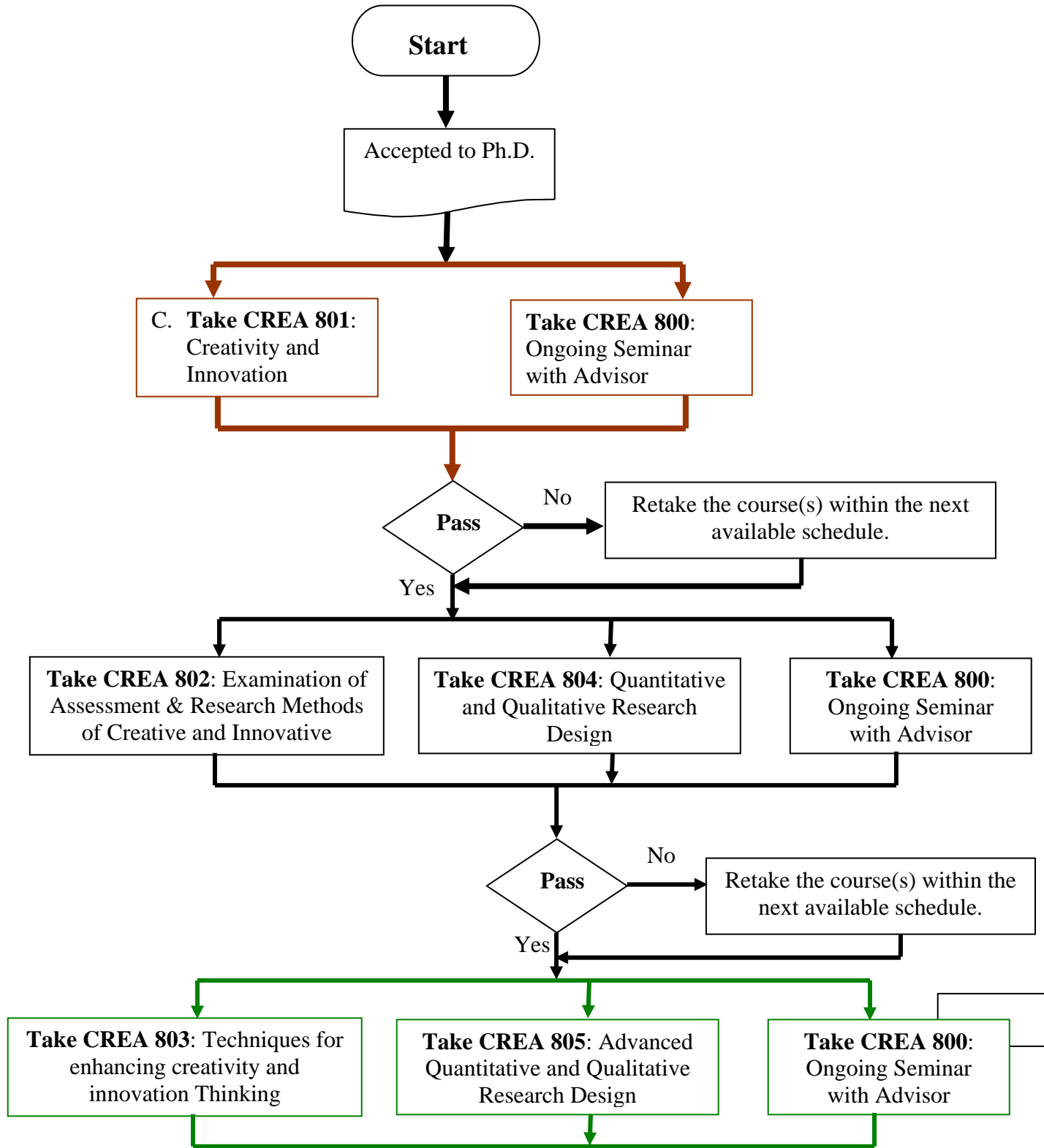
- Response Choices:**
- 1 - Very interested
 - 2 - Moderately interested
 - 3 - Slightly interested
 - 4 - Not interested

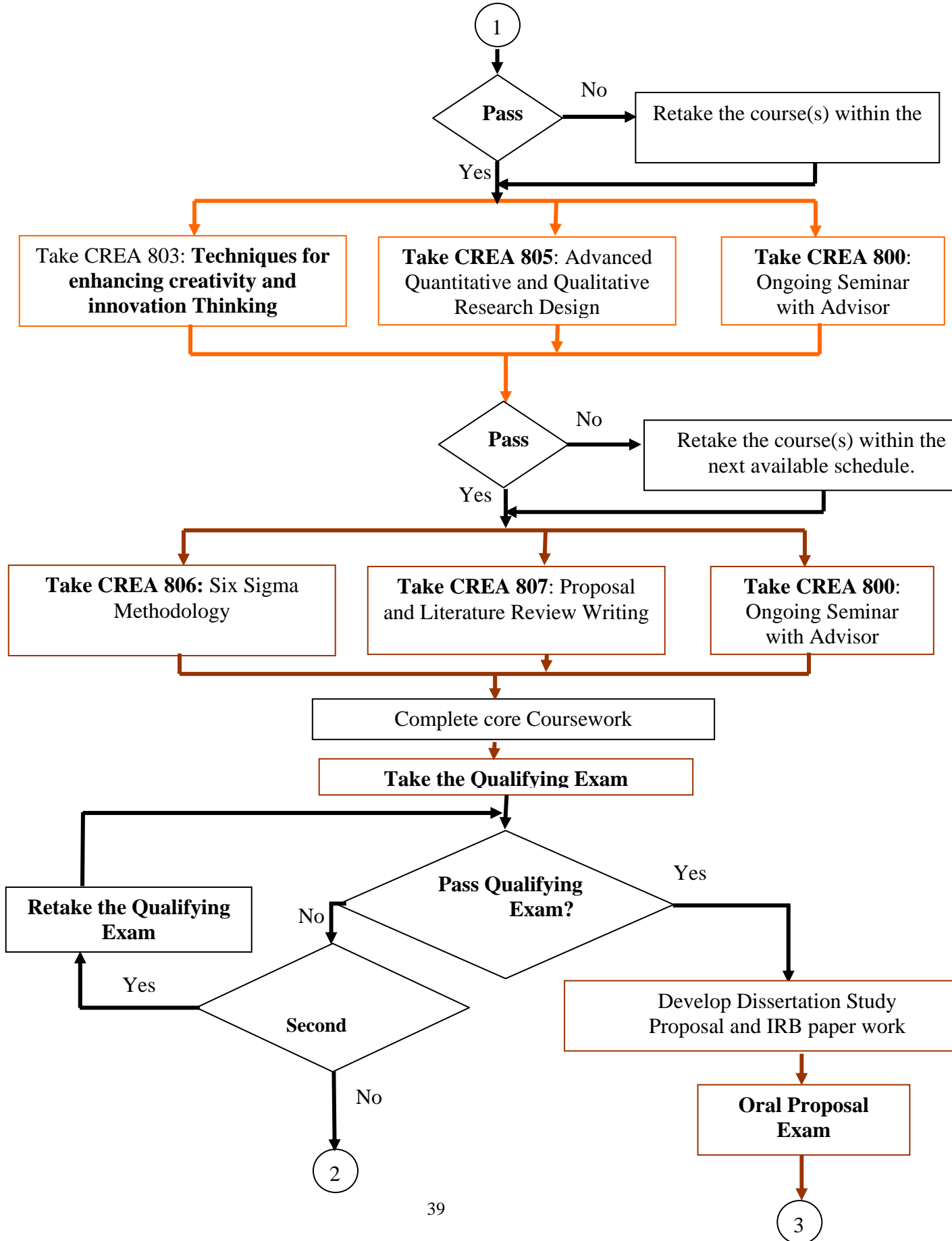
Name/Contact	Question #1	Question #2	Additional Comments
1. Sherry	1	1	I have finished my master's program in Creativity at SUNY Buffalo and am interested in completing a PhD. However, I will be living in NY State. Is this to be a blended program, in-house + distance? I am interested in your program, if it meets with these criteria.
2. Joanna	1	1	- especially if the PhD were offered completely or mostly on-line.
3. bhi22	3	3	
4. lrw33	1	1	
5. Preeti	1	1	Thanks for the information.
6.HATHARHOTEPSESHA	2	1	
7. Armando	2	3	
8. Wayne	1	1	Very interested in PHD in applied

			creativity. Will it be offered by distance?
9. nubn epitome	1	1	
10. vze3ppr8@verizon.net	3	4	
11. michelle	1	1	Attached is my survey. I am very interested in the program and anxious to apply.
12. Doug	1	1	Very interested on both counts. Would my Master's from the ICSC at Buff State count?
13. Nicolin	1	1	I would be very interested in this program - and would like to know more about it.
14. Erica	1	3	
15. Kelly	4	4	
16. ChiSquare8	2	3	
17. tma22	1	1	I would be very interested in applying for this program.
18. Sebastian	1	2	I would like more information on the program.
19. Cynthia	1	1	I am very interested in the proposed PhD in applied creativity, and also very interested in applying.
20. Robert Paul	1	1	
21. met29@drexel.edu	1	1	
22. Yair	2	2	
23. Cathy	2	3	
24. Ardiana	1	1	
25. Kamesha	1	1	
26. Ann Marie	3	1	
27. Michelle Prior	1	1	I am interested in pursuing my PhD once I have completed my M.S. from Drexel and have logged the appropriate amount of teaching hours. This would be a great program.
28. galinagass	2	3	
29. Erin	1	1	
30. Patircia	1	1	1) yes, the program sounds very intriguing, however I would need to know more about the methods used to teach the course. 2) yes, I would be interested.

31. vjs25	1	2	
32. Brian	2	2	Keep me posted
33. David	1	2	
34. Alissa	4	4	
35. Sabrina	1	2	
36. Momoh-Fonigay	1	1	
37. Kamika	1	1	“Send info”
38. Mohamed	1	1	“Very interested, send info”
39. Grace	1	1	
40. Sarah	1	1	This sounds like a great program. I would like to see more information on it!
41. Galina	2	3	
42. Donna	2	2	
43. Mike	1	1	Yes, I am interested in such a program, and secondly, I would apply to the program. Furthermore, I would be very interested in being part of the "beginning" of the program.
44. Michae	1	2	
45. Roberta	1	1	Very excited about the program, if it's online (lives in Detroit)
46. Jessica	1	1	
47. Marsela	1	2	
48. Sharonne	1	1	
49. Leehsia	1	1	
50. Scott	1	1	“It sounds like a great program”
51. Stephanie	1	1	
52. Laurel	1	1	Interested
53. Michael	1	1	
54. Dan	1	2	I could potentially be interested in this program. I am currently in the Creative Studies Program @ Buffalo State College.
55. Jack	1	1	I would be very interested in pursuing a Doctorate in Creativity – depending on how such a program was structured and delivered. I am in Dallas so online course would work for me.

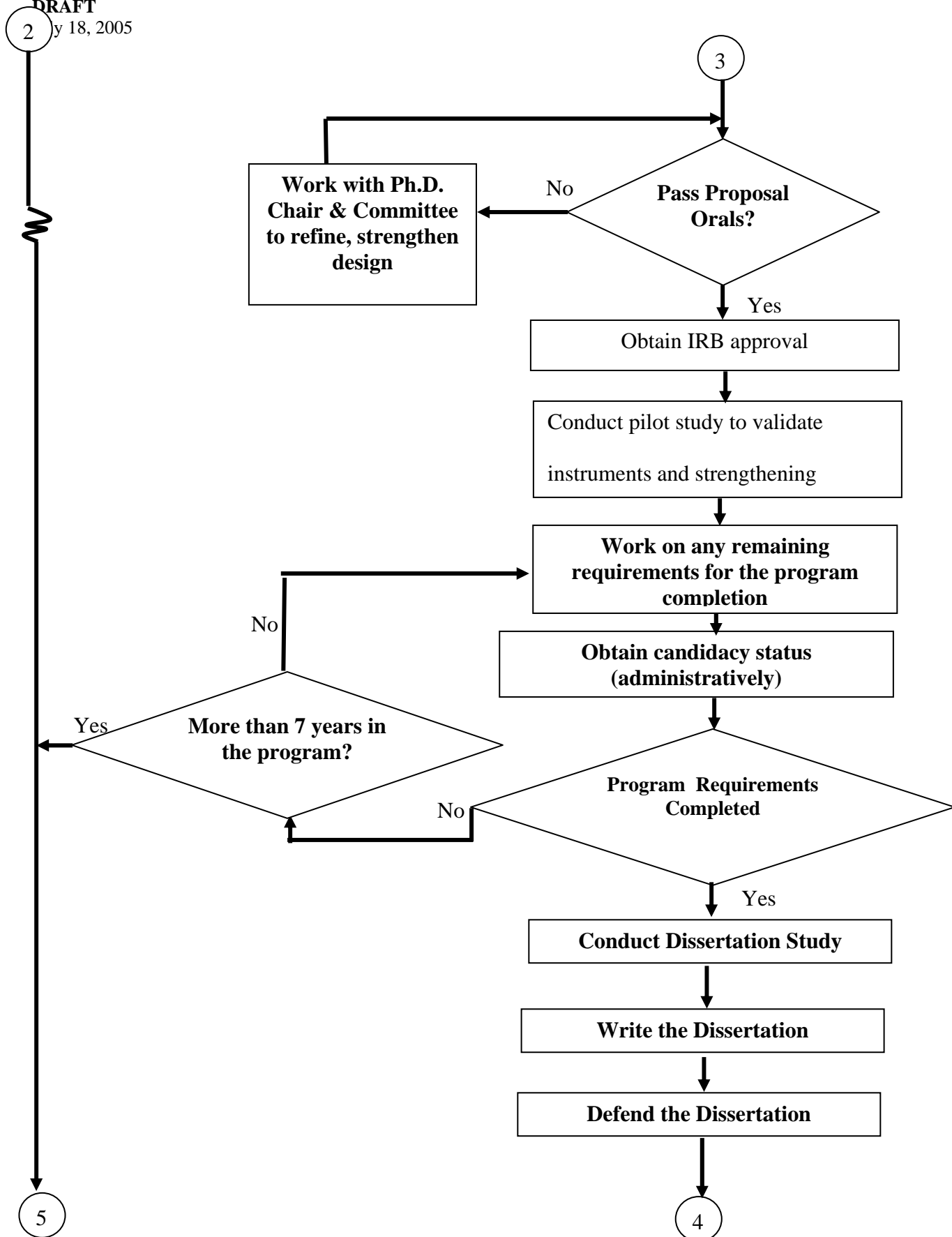
TAB B. Program course work and requirements flow chart

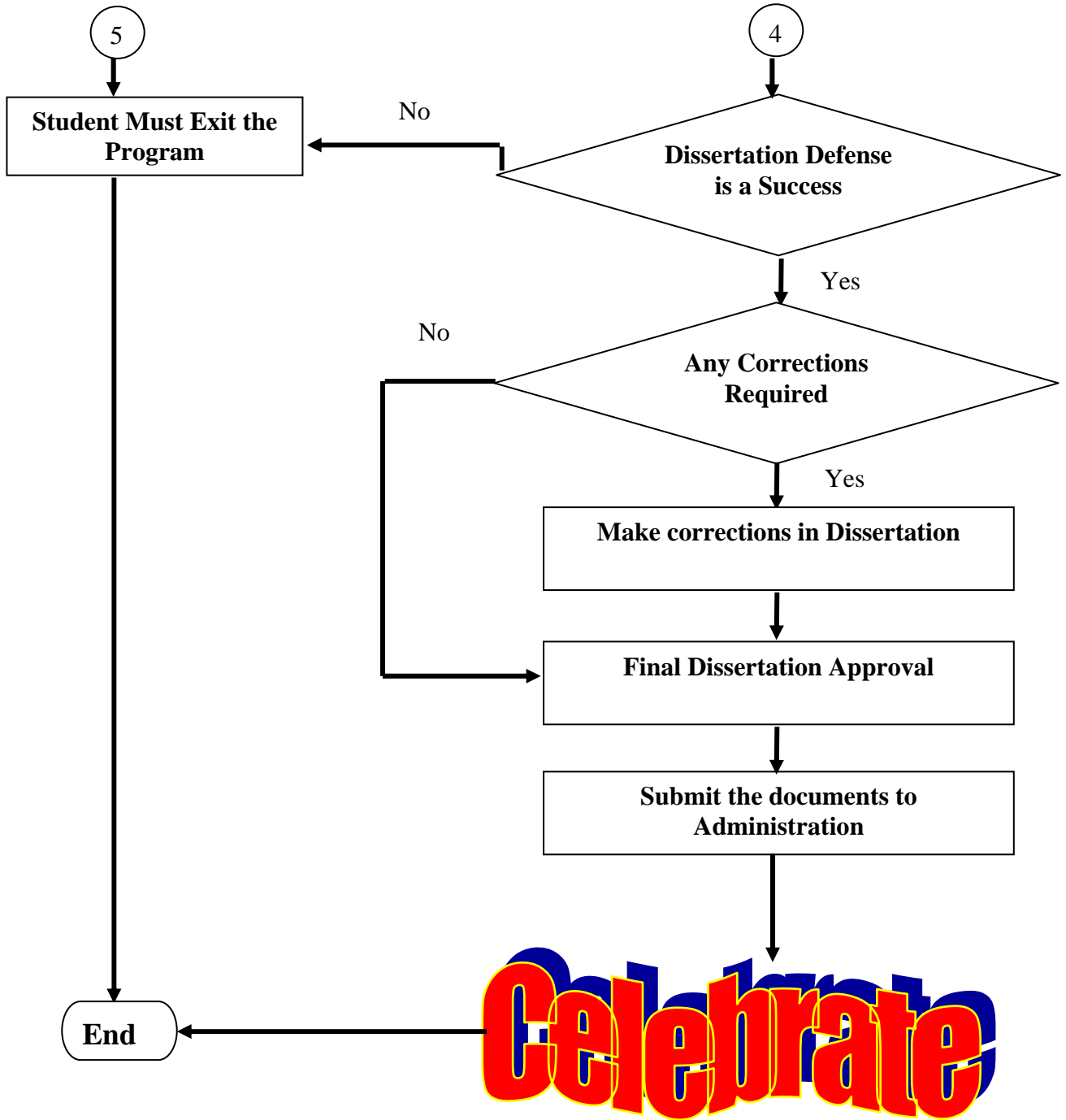




DRAFT

July 18, 2005





TAB C -- Course Syllabi

CREA 801: Creativity and Innovation Theories

Instructor: Fredricka Reisman, Ph.D.

Contact data: email: Freddie@drexel.edu

Course Schedule: Class meets on Monday evenings from 6:00 pm – 9:00 pm (1 hour out of class field experiences) for ten weeks plus eleventh week final exam.

Course Description

This course is one of three foundations courses; this dealing with creativity and innovation theories, the second dealing with creativity and innovation research methodologies, the third dealing with procedures for enhancing creativity and innovation. This course provides the historical and theoretical basis for the Ph.D. in Applied Creativity and Innovation program. Students will be coming from a variety of disciplines, looking to build doctoral level coursework in creativity and innovative thinking onto their masters degree in their discipline, and, simultaneously, developing the experiences and competencies for applying these to their discipline.

Course Goal:

Upon completion of this course, students should be well grounded in the history and theories of creativity and innovation.

Instructional Approach/Format

The primary mode of instruction will be in-class or on line discussions, activities, and lectures. Students will be expected to read through assignments in the textbook as well as any supplemental material provided about various topics in the course. Students will then be expected to use those materials to complete assignments as well as participate in class discussions, and other activities. Guest lectures may be included.

Assessment and Evaluation

The course grade will be determined by assigning the following percents to each of the following categories. Ongoing class participation is expected.

Paper	50%
Midterm	20%
Final	30%

Exams: The midterm and final exams mainly will be matching and multiple-choice items based upon the reading assignments (i.e., Text, Innovation Reports, and Encyclopedia of Creativity 1 and 2). **Plan to take these as scheduled as class statistics for grading require that all students complete exams in accord with the syllabus.**

Paper: The paper is a simulation that will reflect the following three outcomes:

1. Simulate your selected creativity or innovation researcher/theorist in an electronically submitted (email attachment) 15 to 25 page (plus references) 1.5-spaced 12-font paper in Microsoft Word by writing as though you were the researcher/theorist selected.
2. Demonstrate in depth knowledge of the literature based pros and cons of this theory/research.
3. Present as your paper summary, an argument for your personal opinion of this theory/research drawing from relevant course content (e.g., compare and contrast other research/theories) or from other well documented sources (may include interviews with well recognized experts in creativity and innovation, publications in refereed journals, recent books,).

Criteria for paper evaluation:

- Emphasis will be on developing a point of view that is research based and amenable to further research.
- Clear idea presentation with a logical sequence.
- Use of APA format throughout (e.g., usage, style, references).
- Evidence of thorough understanding of the selected theory/research to the point of becoming a resource to others seeking information or understanding of the theory/research.
- Meeting deadlines.

The rubric for paper evaluation is:

1 (does not meet criteria)	D
2 (meets some criteria)	C
3 (meets most criteria)	B
4 (meets all criteria)	A
5 (exceeds all criteria)	A+

Suggested Writing Aids:

Publication Manual of the American Psychological Association (Fifth Edition). (2002). Washington, D.C.: American Psychological Association.

Bell, Judith.(1994). *Doing your research project (2nd edition):a guide for first-time researchers in education and social science*. Bristol, PA: Open University Press.

Henson, Kenneth T. (1995). *The art of writing for publication*. Boston: Allyn and Bacon.

Phillips, Estelle M. and Pugh, D.S. (1995). *How to get a PhD: a handbook for students and their supervisors (2nd edition)*. Bristol, PA: Open University Press.

Course Schedule

Date	Week	September-October 2006		
		Topic	Reading (complete before	Benchmark

			indicated week)	Activity
25	Week one	Course overview <ul style="list-style-type: none"> •The innovation process • Historical data on creativity •How to score high on creativity tests 	<ul style="list-style-type: none"> • Text: Preface, Chapter 1 • Reading: Encyclopedia of Creativity 1, Guilford’s view, pp.785- 797; Encyclopedia of Creativity 2, Innovation, pp.45-55; leadership, pp. 139-145; Chronology, pp.751-753 	<ul style="list-style-type: none"> •Innovation readiness survey • Torrance Tests of Creative Thinking-Figural
2	Week two	<ul style="list-style-type: none"> • Key steps in becoming an Innovative organization •What is creativity? •Creativity theories 	<ul style="list-style-type: none"> • Text: Chapters 2,3 • Reading: Encyclopedia of Creativity 1:Componential Models, pp. 295- 300; • Reading: Encyclopedia of Creativity 2, Systems Approach, pp. 605-609 	Complete readings prior to week two in preparation for class discussion. <ul style="list-style-type: none"> • Torrance Tests if Creative Thinking - Verbal
9	Week three	Columbus Day University Holiday		
16	Week four	<ul style="list-style-type: none"> •Starting an innovative initiative • Perspectives on creativity 	<ul style="list-style-type: none"> •Text: Chapter 4 • Reading: Encyclopedia of Creativity 1, Economic Perspective on Creativity, pp. 623-627; Emotion/affect, pp. 659-668; • Reading: Encyclopedia of Creativity 2: Multiple Intelligences, pp. 273-283 	Identify your researcher/theorist to your instructor and cohort mates in class (on line for distance students). Begin crafting your paper.

Date	Week	October- November 2006		
		Topic	Reading	Benchmark Activity
23	Week five	<ul style="list-style-type: none"> •Launch a new endeavor or product • Creativity theories 	<ul style="list-style-type: none"> •Text: Chapter 5 • Reading: Encyclopedia of Creativity 2: Incubation, pp. 39-43; Intelligence-Creativity, pp. 81-88; Knowledge, pp. 119-129; Motivation, pp. 251-259 	Midterm exam on weeks 1 – 4 (last 1 1/2 hours of class)
30	Week six	Innovation best practices: Leadership,	<ul style="list-style-type: none"> • Innovation Report 2004-2009 •Text: Chapter 6 	

		Organizational structure	<ul style="list-style-type: none"> • Reading: Encyclopedia of Creativity 2, Organizations/ Creativity, pp. 319-323; Paradigm shifts, pp. 335-346; Play, pp. 393-408 	
6	Week seven	Innovation best practices: Idea management, Tools & techniques	<ul style="list-style-type: none"> • Innovation Report 2004-2009 •Text: Chapters 7.8 • Reading: Encyclopedia of Creativity 2, Perception & creativity, pp. 355-360 	
13	Week eight	Innovation best practices: Measurement, Rewards & recognition systems	<ul style="list-style-type: none"> • Innovation Report 2004-2009 •Text: Chapters 9, 10; •Reading: Encyclopedia of Creativity 1, History of Creativity, pp. 309-322 •Reading: Encyclopedia of Creativity 2: Self-actualization, pp. 533- 536 	

Date	Week	November- December 2006		
		Topic	Reading	Benchmark Activity
20	Week nine	Domains of creativity Theories cont'd. Course review	<ul style="list-style-type: none"> •Text: Chapter 11 • Reading: Encyclopedia of Creativity 1: Creativity in the moral domain, pp. 427-432; Generativity theory, 759-766; Critical thinking, pp. 449- 452; Domains of Creativity, pp. 591-596 •Reading: Encyclopedia of Creativity 2: Quantum theory of creativity, pp. 491-500 	Paper due
I. Thanksgiving Holiday				
27	Week ten	Creative presentations		Presentation: ONE new personal insight gained from the course presented in a creative way.
4	Week eleven	J. Final Exam (Covers weeks 1-10, with emphasis on weeks 5-10) K.		

Required Reading:

Text: Sternberg, R.J., Grigorenko, E.L., Singer, J.L. Editors (2004) *Creativity: from potential to realization*. Washington, D.C. : American Psychological Association.

Readings: Runco, M.A. & Pritzker, S.R. Editors-in-Chief (1999) *Encyclopedia of Creativity*. Volume 1, A-H. San Diego, CA: Academic Press.

Readings: Runco, M.A. & Pritzker, S.R., Editors-in-Chief (1999) *Encyclopedia of Creativity*. Volume 2, I-Z, Indexes. San Diego, CA: Academic Press.

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CREA 802: Research Methods and Assessment of Creative and Innovative Thinking

Instructor: Fredricka Reisman, Ph.D. or New Hire

Contact data: email: Freddie@drexel.edu

Course Schedule: **Class meets on Monday evenings from 6:00 pm – 9:00 pm (1 hour out of class field experiences) for ten weeks plus eleventh week final exam.**

Course Description

This course will focus on research methods for studying creativity and innovation. Included are psychometric approaches, experimental studies, the case study method, methodologies, biographical methods, biological methodologies, computational methodologies, and creativity from a historiometric perspective.

This course is one of three foundations courses; this dealing with creativity and innovation research methodologies, the first dealing with creativity and innovation theories, and the third dealing with procedures for enhancing creativity and innovation . Included are psychometric approaches to the study of human creativity, experimental studies, the case study method, and systems approach for understanding unique creative people (biographical methods), biological methodologies, computational methodologies, and creativity from a historiometric perspective. Students will be coming from a variety of disciplines, looking to build doctoral level coursework in creativity and innovative thinking onto their masters degree in their discipline, and, simultaneously, developing the experiences and competencies for applying these to their discipline

Course Goal:

Upon completion of this course, students should be well grounded in various methodologies of investigating creativity and innovation.

Instructional Approach/Format

The primary mode of instruction will be in-class or on line discussions, activities, and lectures. Students will be expected to read through assignments in the textbook as well as any supplemental material provided about various topics in the course. Students will then be expected to use those materials to complete assignments as well as participate in class discussions, and other activities. Guest lectures may be included.

Assessment and Evaluation

The course grade will be determined by assigning the following percents to each of the following categories. Ongoing class participation is expected.

Paper	50%
Midterm	20%
Final	30%

Exams: The midterm and final exams mainly will be matching and multiple-choice items based upon the reading assignments (i.e., Text, Innovation Reports, and Encyclopedia of Creativity 1 and

2). Plan to take these as scheduled as class statistics for grading require that all students complete exams in accord with the syllabus.

Paper: The paper will reflect the following three outcomes:

1. Identify the pros and cons of three research methods discussed in class in an electronically submitted (email attachment) 15 to 25 page (plus references) 1.5-spaced 12-font paper in Microsoft Word by writing as though you were an evaluator of creativity research paradigms.
2. Demonstrate in depth knowledge of the literature based pros and cons of these three methods
3. Present as your paper summary, an argument for your personal choice of one of the research drawing from relevant course.

Criteria for paper evaluation:

- Emphasis will be on developing a point of view that is research based and amenable to further research
- Clear idea presentation with a logical sequence.
- Use of APA format throughout (e.g., usage, style, references).
- Evidence of thorough understanding of the selected theory/research to the point of becoming a resource to others seeking information or understanding of the theory/research.
- Meeting deadlines.

The rubric for paper evaluation is:	1 (does not meet criteria)	D
	2 (meets some criteria)	C
	3 (meets most criteria)	B
	4 (meets all criteria)	A
	5 (exceeds all criteria)	A+

Course Schedule

Date	Week	January 2007		
		Topic	Reading (complete before indicated week)	Benchmark Activity
8	Week one	Course overview Dynamics underlying creativity	•Text A: Intro, Chapter 1 • <i>Encyclopedia of Creativity</i> . Volume 2: Janusian process, pp. 103-118; Longitudinal studies, pp. 163-168	
15	Martin Luther King, Jr., Day (University Holiday)			
22	Week two	Developmental trends in creativity and innovation	Text A: Chapter 2 • <i>Encyclopedia of Creativity</i> . Volume 2: Developmental trends in	

			creative abilities and potentials, pp. 537-540 Misjudgment, pp. 235-240; Novelty, pp. 297-304; Perceptogenesis, pp. 347-354	
29	Week three	Definitions	<ul style="list-style-type: none"> •Text A: Chapter 3 • <i>Encyclopedia of Creativity</i>. Volume 2: Personality, pp. 361-371; Science, pp. 525-531; Teams, pp. 639-649; Definitions of creativity, pp. 511-524 	

Date	Week	February - March 2007		
5		Topic	Reading (complete before indicated week)	Benchmark Activity
12	Week four	Physiology Climate for Creativity	Text A: Chapter 4 • <i>Encyclopedia of Creativity</i> . Volume 2: Split-brains-interhemispheric exchange in creativity; Television and creativity, pp. 651-658	
19	Week five	Divergent versus convergent thinking Personal creativity	Text A: Chapter 5 • <i>Encyclopedia of Creativity 2</i> : Distribution of creativity, pp. 573-576; Divergent thinking, pp. 577-582; Time, pp. 659-663; Toulouse-Lautrec, pp. 665-672	Midterm exam
26	Week six	Assessment instruments and procedures Leadership: fostering systemic creativity	Text A : Chapter 6 • <i>Encyclopedia of Creativity 2</i> : Consensual assessment, pp. 347-359; Tests of creativity, pp. 755-760	
5	Week seven	Creative products Purposeful creativity	Text A: Chapter 7 • <i>Encyclopedia of Creativity 1</i> : Writing & creativity, pp. 727-736;	

			Creative products, pp. 413-422; Handwriting & creativity, pp. 799-805	
12	Week eight	Methodologies cont'd Sustaining the change	Text A: Chapter 8 • <i>Encyclopedia of Creativity</i> 1: Eminence, pp. 647-657; Historiometry, pp. 815-822	
	Week nine	Critical & creative thinking	Text B: Part I and II	Paper due
19	Week ten			Final exam

Required Reading:

Text A: Mauzy, J. & Harriman, R. (2003). *Creativity, Inc.: Building an inventive organization*. Boston, Massachusetts: Harvard Business School Press.

Text B: Paul, R. & Elder, L. (2004). *The Nature and functions of critical thinking*

Readings: Runco, M.A., & Pritzker, S.R., Editors-in-Chief (1999) *Encyclopedia of Creativity*. Volume 1, A-H. San Diego, CA: Academic Press.

Readings: Runco, M.A., & Pritzker, S.R., Editors-in-Chief (1999) *Encyclopedia of Creativity*. Volume 2, I-Z, Indexes. San Diego, CA: Academic Press.

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CREA 803: Techniques for Enhancing Creativity and Innovation

Instructor: Fredricka Reisman, Ph.D **Contact data:** email: Freddie@drexel.edu

Course Schedule: Class meets on Monday evenings from 6:00 pm – 9:00 pm (1 hour out of class field experiences) for ten weeks plus eleventh week final exam.

Course Description

This course includes ways of enhancing creativity and innovation through creative problem solving techniques and strategies presented from corporate and academic leadership perspectives. Case studies of innovative start-up companies and training approaches (e.g. Eureka Ranch, Honeywell, General Electric, AlliedSignal) will complement academic applications.

This course is the third of the three foundations courses; this dealing with procedures for enhancing creativity and innovation, the first dealing with creativity and innovation theories, and the second dealing with creativity and innovation research methodologies. Students will be coming from a variety of disciplines looking to build doctoral level coursework in creativity and innovative thinking onto their masters degree in their discipline, and, simultaneously, developing the experiences and competencies for applying these to their discipline

Course Goal:

Instructional Approach/Format

The primary mode of instruction will be in-class or on line discussions and collaborative peer and instructor feedback on work created. Students will be expected to read through assignments in the textbook as well as any supplemental material provided as a basis for course goal development.

Assessment and Evaluation

The course grade will be determined by assigning the following percents to each of the following categories. Ongoing class participation is expected.

Final Paper	50%
Midterm	20%
Final	30%

Exams: The midterm and final exams mainly will be matching and multiple-choice items based upon the reading assignments (i.e., Text, Innovation Reports, and Encyclopedia of Creativity 1 and 2). Plan to take these as scheduled as class statistics for grading require that all students complete exams in accord with the syllabus.

Paper:

The paper will form the basis for a creativity/innovation enhancement program applied to your area of expertise and experience. Emphasis will be on drawing from the course readings to create a research based enhancing creativity and innovation program.

Criteria for paper evaluation:

- Emphasis will be on developing a point of view that is research based and amenable to further research
- Clear idea presentation with a logical sequence.
- Use of APA format throughout (e.g., usage, style, references).
- Evidence of thorough understanding of the selected theory/research to the point of becoming a resource to others seeking information or understanding of the theory/research.
- Meeting deadlines.

The rubric for paper evaluation is:

1 (does not meet criteria)	D
2 (meets some criteria)	C
3 (meets most criteria)	B
4 (meets all criteria)	A
5 (exceeds all criteria)	A+

Course Schedule

Date	Week	April – May - June 2007		
		Topic	Reading (complete before indicated week)	Benchmark Activity
2	Week one	Societal, global, professional contexts The conceptual age	<ul style="list-style-type: none"> • Text 2020: Preface; Executive summary, Chapters 1-2 • Text Pink: Introduction, Chapters 1-3 • Reading: Encyclopedia of Creativity 1: Enhancement of creativity, pp. 669-675; • Reading: Encyclopedia of Creativity 2: Teaching creativity, pp. 629-638 	
9	Week two	Pink's six senses Enhancement techniques	<ul style="list-style-type: none"> • Text 2020: Chapters 3-4 • Text Pink: Chapters 4-6 • Reading: Encyclopedia of Creativity 1: Group creativity, pp. 779-784 • Reading: Encyclopedia of Creativity 2: Tactics & strategies for creativity, pp. 611- 615 	Complete readings prior to week two in preparation for class discussion.
16	Week three	Pink's six senses cont'd Scenarios	<ul style="list-style-type: none"> • Text Pink: Chapters 7-9, After word • Text 2020: Appendix A • Text B & C: Introduction, 	

		Need for execution	Chapters 1-2 • Reading: Encyclopedia of Creativity 2: Talent & creativity, pp. 623-627	
23	Week four	Building blocks of execution Enhancement techniques	• Text B & C: Chapters 3-5 • Reading: Encyclopedia of Creativity 1: Heuristics, pp. 807-813; Humor, pp. 845-853	
30	Week five	Core processes of execution	• Text B & C: Chapters 6-9, Conclusion • Reading: Encyclopedia of Creativity 1: Education, pp. 629-642; Everyday creativity, pp. 683-687; Insight & problem solving-evolving systems, pp. 689-693 • Encyclopedia of Creativity 2: Vygotsky, pp. 691-697	
7	Week six	Enhancement aids	• Reading: Encyclopedia of Creativity 1: Types of blocks-fixation, pp. 725-728; Flexibility, pp. 729-732; • Reading: Encyclopedia of Creativity 2: Intuition, pp. 89-93; Invention, pp. 95-102; Logic & reasoning, pp. 155-161; Metaphors, pp. 209-219; Mindfulness, pp. 221-234;	Midterm exam on weeks 1 – 5 (last 1 1/2 hours of class)
14	Week seven	Creative problem solving tactics grid	• Reading: Encyclopedia of Creativity 2: Problem finding, pp. 433-435; Problem solving, pp. 437-447; Programs & courses in creativity, pp. 465-477	
21	Week eight	Issues that affect enhancing creative and innovative acts	• Reading: Encyclopedia of Creativity 1: Gender differences, pp. 753-758; Links –five-part topology, pp. 717-723; Four aspects of creativity & innovation, 733-742; Fourth grade slump, pp. 743-744; Giftedness & creativity, pp. 773-777;	
28	Memorial Day (University Holiday)			
4	Week nine	Issues that affect enhancing creativity and	• Reading: Encyclopedia of Creativity 1: Counseling, pp. 395-402; Creative climate, pp.	

		innovation	403-412; Dreams & creativity, pp. 597-606; : Drugs & creativity, pp. 607-611; Expertise, pp. 695-707; Families & creativity, pp. 709-715	
11	Week ten	Final Exam (Covers weeks 1-10, with emphasis on weeks 6 -10)		

Required Reading:

Text: Bossidy, L. & Charan, R. (2002) *Execution: the discipline of getting things done*. New York, N.Y.: Crown Business.

Text: National Academy of Engineering of the National Academies (2004) *The Engineer of 2020: Visions of Engineering in the New Century* (Stephen W. Director, Project Liaison) Washington, D.C. : The National Academies Press.

Text Pink, D.H. (2005) *A whole new mind: moving from the information age to the conceptual age*. New York, N.Y.: Riverhead Books.

Reading: Runco, M.A, & Pritzker, S.R., Editors-in-Chief (1999) *Encyclopedia of Creativity*. Volume 1, A-H. San Diego, CA: Academic Press.

Reading: Runco, M.A, & Pritzker, S.R., Editors-in-Chief (1999) *Encyclopedia of Creativity*. Volume 2, I-Z, Indexes. San Diego, CA: Academic Press.

Suggested Reading:

Christensen, C.M. (2003). *The Innovator’s Solution: Creating and sustaining successful growth*. Boston, Massachusetts: Harvard Business School Press.

Christensen, C.M.(2003). *The Innovator’s Dilemma*. New York, N.Y.: HarperCollins.

Hargadon, A. (2003). *How Breakthroughs Happen: The surprising truth about how companies innovate*. Boston, Massachusetts: Harvard Business School Press.

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CREA 804: Quantitative and Qualitative Research Design: Basics for Creativity Research Paradigms

Course Information: CREA 804 — Quantitative and Qualitative Research Design: Basics for Creativity Research Paradigms (3 credits)

Course Description: This course provides grounding in the concepts, principles, and procedures involved in conducting research. Quantitative and qualitative research design provides basic premise of the program in Creativity at Drexel University. Research, the derived knowledge, forms the basis for practice in most professions.

Prerequisites: CREA 801, 802, 803

Content Knowledge: Descriptive and inferential statistics

Course Schedule: Class meets on Monday evenings from 6:00 pm – 9:00 pm (1 hour out of class field experiences) for ten weeks.

Required Text/material: “Research Design: Qualitative, Quantitative, and Mixed Methods Approaches” by John W. Creswell; “The Research Methods Knowledge Base” by William M. K. Trochim; “Experimental and Quasi-Experimental Designs for Research” by Donald T. Campbell, Julian C. Stanley; course notes and other reading suggested as supporting literature.

Instructor: Dr. Mira Lalovic

Telephone: (215) 895-6192 (Work)

Fax: (215) 895-2153 (Work)

Email: mira.lalovic@drexel.edu

Office Hours: One hour before the start of each class or by appointment

Course Learner Objectives:

The purpose of this course is to provide a framework for constructing relevant quantitative interrelationships grounded on process evaluation and research design. The class should equip the student with the fundamental skills required to design, conduct, report and critically evaluate research studies both quantitative and qualitative. Students are expected to develop competencies in research design, data collection, and data analysis. They are expected to have a working knowledge of the theory and practice of doing archival research, interviews, surveys, and behavioral observations, and to understand and be able to conduct a post occupancy evaluation. Technological advances in computer use will allow the new research student to follow and apply this information to her/his specific research project. One must learn to think deductively and inductively in order to view the similarities and differences of both methods which can enhance hers or his methodological approach to research questions.

Topical Outline:

- What is Research Design?
- Ways of Approaching Research: Quantitative Designs
- Overview of Qualitative Research
- Types of Designs
- Threats to Internal & External Validity
- Basic Issues in Research Design

- Experimental Design
- Stages in the Polling Process
- Sampling and Technical Issues
- Questionnaire Design
- Data Analysis and Processing
- Message and Strategy Recommendations, Report-writing and Presentations

Instructional Approach/Format

The primary mode of instruction will be in-class discussions, activities, and lectures. Students will be expected to read through assignments in the textbook as well as any supplemental material assigned about various topics in the course. Students will then be expected to use those materials to complete assignments as well as participate in class discussions, and other activities.

Assessment and Evaluation

The course grade will be determined by assigning the following percents to each of the following categories. These may vary at the end of the quarter depending on what kinds of assignments, exams, etc are given.

Class participation	20%
1st assignment	10%
Mid-term	15%
2nd assignment	25%
Final Presentation	30%

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CREA 805: Advanced Quantitative and Qualitative Research Design in Applied Creativity and Innovation

Course Information: CREA 805— Advanced Quantitative and Qualitative Research Design in Applied Creativity and Innovation (3 credits)

Course Description: The aims of the course are to provide students with advanced techniques and procedures involved in conducting research relevant to the major paradigms in creativity research presented in CREA 802. The objective of the course is to achieve an understanding of the advantages and limitations of various statistical techniques, and to apply this knowledge in the formulation of a research question, and a research design appropriate to student’s investigation. Practice in data processing using computers

Prerequisites: CREA 801, 802, 803, 804

Course Schedule: Class meets on Tuesday evenings from 6:00 pm – 9:00 pm (1 hour out of class field experiences) for ten weeks.

Required Text/material:

“Research Design: Qualitative, Quantitative, and Mixed Methods Approaches” by John W. Creswell; “The Research Methods Knowledge Base” by William M. K. Trochim; “Experimental and Quasi-Experimental Designs for Research” by Donald T. Campbell, Julian C. Stanley; course notes and other reading suggested as supporting literature.

Instructor: Dr. Jeff Hand

Telephone: (215) 895-1802 (Work)

Fax: (215) 895-2153 (Work)

Email: jeff.hand@drexel.edu

Office Hours: One hour before the start of each class or by appointment

Course Learner Objectives:

At the end of this course, students will be able to apply parametric, nonparametric and multivariate techniques in the analysis of social science data. They will learn to formulate research questions and hypotheses, specify statistical models, carry out the appropriate analyses, interpret their findings, and communicate their results clearly and effectively.

Course Outline:

CLASS	WEEK	TOPIC
1	Week 1	Introduction and Overview
2	Week 2	Research Problems, Purpose, and Hypotheses
3	Week 3	Sources of Information and Research Frameworks
4	Week 4	Sampling
5	Week 5	Parametric techniques
6	Week 6	Parametric techniques, cont.
7	Week 7	Nonparametric techniques - Introduction and EXAM 1
8	Week 8	Nonparametric techniques
9	Week 9	Ethics & Research and intro to Multivariate techniques
10	Week 10	Multivariate techniques, cont.
11	Week 11	Final examination

Instructional Approach/Format

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1st assignment	10%
Mid-term	15%
2nd assignment	25%
Final exam	30%

A bibliography for the course is still being developed for the advanced statistical procedures. The following are some of the materials that the students may have been exposed to in prior research design courses. No one book covers the entire syllabus; students will be expected to read widely in appropriate journals, and a list of recommended readings is provided below:

- Babbie E. *The Practice of Social Research*, 7th edition. Belmont, CA: Wadsworth, 1995. Boston: Houghton Mifflin, 1979.
- Bradburn N & Sudman S. *Improving Interview Method and Questionnaire Design*. San Francisco: Jossey-Bass Publishers. 1981.
- Campbell, D. T., & Stanley, J. C.: *Experimental and quasi-experimental designs for research*. Boston: Houghton Mifflin, 1963
- Cohen, J.: *Statistical power analysis for the behavioral sciences (2nd ed.)*. Hillsdale, NJ: Lawrence Elbaum Associates.1988
- Cook, TD & Campbell DT. *Quasi-Experimentation: Design and Analysis Issues for Field Settings*.
- Fowler, FJ & TW Mangione. *Standardized Survey Interviewing: Minimizing Interviewer-Related Error*. Newbury Park, CA: Sage Publications, 1990.

- Fowler, FJ. *Survey Research Methods*. Newbury Park, CA: Sage Publications, 1993
- Green, S.B., & Salkind, N.J.: *Using SPSS for Windows and MacIntosh: Analyzing and Understanding Data* (3rd ed.). Upper Saddle River, NJ: Prentice-Hall, 2003
- Grim, L.G., & Yarnold, P.R.: *Reading and understanding more multivariate statistics*. Washington, D.C.: American Psychological Association, 2000
- Grim, L.G., & Yarnold, P.R.: *Reading and understanding multivariate statistics*. Washington, D.C.: American Psychological Association, 1995
- Henry GT. *Practical Sampling*. Newbury Park, CA: Sage Publications, 1990.
- Heppner, P. P., Kivlighan, D. M., & Wampold, B. E.: *Research design in counseling*. Belmont, CA: Wadsworth Publishing, 1999
- Hulley SB, Cummings SR. *Designing Clinical Research*. Baltimore: Williams and Wilkins, 1988.
- *Journal of Critical Care*, 5(3), 207-216. Thompson SK, & GA Seber. *Adaptive Sampling*. John Wiley & Sons, Inc., 1996.
- Lavrakas, PJ. *Telephone Survey Methods: Sampling, Selection, and Supervision*. Newbury Park, CA: Sage Publications, 1993.
- Lipsy MW. *Design Sensitivity: Statistical Power for Experimental Research*. Newbury Park, CA: Sage Publications, 1990.
- Maxim, PS. *Quantitative Research Methods in the Social Sciences*. New York: Oxford University Press, 1999.
- Neuman, WL. *Social Research Methods: Qualitative and Quantitative Approaches*. Boston: Allyn & Bacon, 1997.
- Spector P. *Research Designs*. Newbury Park, CA: Sage Publications, 1981
- Spilder, B (ed.) *Quality of Life Assessments in Clinical Trials*. NY: Raven Press, 1990.
- Staquet, MJ, RD Hays, PM Fayers. *Quality of Life Assessment in Clinical Trials: Methods and Practice*. Oxford, 1998
- Streiner, DL, GR Norman. *Health Measurement Scales: A Practical Guide to their Development and Use*. Oxford, 1995.
- Sudman S, & NM Bradburn. *Asking Questions: A Guide to Questionnaire Design*. San Francisco: Jossey-Bass, 1982.
- Sudman S, NM Bradburn, & N Schwartz. *Thinking About Answers: The Application of Cognitive Processes to Survey Methodology*. Jossey-Bass, 1995.
- Sudman S. *Applied Sampling*. New York: Academic Press, 1976.
- Szaflarski, N.L., & Slaughter, R.E. (1996). *Technology assessment in critical care: Understanding statistical analyses used to assess agreement between methods of clinical measurement*. American Psychological Association, 1996.
- Tabachnick, B.G., & Fidell, L.S.: *Using multivariate statistics* (4th edition). Boston: Allyn and Bacon, 2001.
- Wampold, B.: *The great psychotherapy debate: Models, methods, and findings*. Mahwah, NJ: Lawrence Erlbaum Associates, 2000

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CREA 806: Six Sigma Methodology

Instructor: Dr. Mira Lalovic
Telephone: (215) 895-6192 (Work)
Fax: (215) 895-2153 (Work)
Email: mira.lalovic@drexel.edu
Office Hours: One hour before the start of each class or by appointment

Course Description: Six Sigma methodology will provide students with methods and tools for evaluating any process or operation and examines elements of complex systems, create environment in which best solution to particular challenge is applied using a rigorous analytical methodology, focus on creative and innovative decision making processes and problem solving applied to practical situations. Six Sigma is a successful breakthrough management tool, a fact-based, data driven methodology that can be applied to any field.

The course provides students with a comprehensive approach to continuous quality improvement and best practices in identifying and solving critical to quality problems. In the world of Six Sigma the knowledge is power. Students will have an insight in advanced tools and problem solving techniques, and critical skills for leadership in an enterprise-wide deployment, field specific.

Content Knowledge: Descriptive and inferential statistics

Course Schedule: Class meets on Monday evenings from 6:00 pm – 9:00 pm (1 hour out of class field experiences) for ten weeks.

Required Text/material: Course notes, suggested literature and “The Certified Six Sigma Black Belt PRIMER” by Quality Council of Indiana, as a supporting guideline

Course Learner Objectives: Upon completion of this course, students should be experienced process improvement practitioners. They will gain a comprehensive overview of Six Sigma practices and develop critical skills required to creatively lead results-driven process improvement projects and innovation initiatives.

Topical Outline: DMAIC – *Design-Measure-Analyze-Improve-Control* is the essence of the Six Sigma methodology as a disciplined approach to problem solving. Major topic areas are based around it:

Define customer requirements

- Voice of the customer (VOC)
- Transferring the VOC to the design of the product or service
- Project management

Measure process inputs that affect customer satisfaction

- Tools to monitor the process (static and dynamic)
- Determine process capable of meeting customer requirements

Analyze process parameters using statistical and non-statistical techniques

DRAFT

July 18, 2005

- Testing methodologies for decision making - when and when not to adjust
- Process behavior tools

Improve and innovate to reduce variation and increase customer satisfaction

- Design of experiments (various types and strategies)
- Lean thinking
- Design for Six Sigma

Control and maintain improvements realized through successful projects

- Control charts (various types and innovative uses of)
- Capability studies
- Transferring knowledge gained

Projects

- Participants will also work on a quality improvement project. They will work on the project of their choice.

Course schedule:

January

		6:00 PM to 7:00 PM	7:00 PM to 8:00 PM	8:00 PM to 9:00 PM
4	week one	Six Sigma Overview	Basic Tools of Quality and DMAIC methodology	Statistical thinking - Descriptive statistics & Probability
11	week two	Discrete and Continuous Probability Distributions	Introduction to Hypothesis and Confidence Interval	Control Charts -
18	week three	Process Capability and Process Metrics	Project Definition Proposal/Selection Exercise	Six Sigma Measurements and Creativity
25	week four	Project Definition Proposal/Selection Exercise		

February

		6:00 PM to 7:00 PM	7:00 PM to 8:00 PM	8:00 PM to 9:00 PM
1	week five	Measurement System Analysis	Process Flowcharting / Process Mapping and Benchmarking	Voice of the Customer -- Exercises and Review
8	week six	Lean thinking	Inferences: Continuous Response	Failure Mode and Effects Analysis (FMEA) & Cause- and-Effect Matrix & QFD
15	week seven	Comparison Tests: Attribute (Pass/Fail) Response; Attribute (Pass/Fail) Response; Continuous Response	Correlation and Simple Linear Regression	ANOVA
22	week eight	Project review		Design for Six Sigma

March

		6:00 PM to 7:00 PM	7:00 PM to 8:00 PM	8:00 PM to 9:00 PM
1	week nine	Control Plan and Mistake Proofing; Reliability Testing	Benefiting from Design of Experiments (DEO) and Understanding of Full and Fractional Factorial	
8	week ten	Leadership; Managing Change; Team Effectiveness	Alignment of Management Initiatives and Strategies; Creativity;	
15	week eleven	project Review and Presentation		

Instructional Approach/Format

The primary mode of instruction will be in-class discussions, activities, and lectures. Students will be expected to read through assignments in the textbook as well as any supplemental material assigned about various topics in the course. Students will then be expected to use those materials to complete assignments as well as participate in class discussions, and other activities. Guest lectures will be included.

Assessment and Evaluation

The course grade will be determined by assigning the following percents to each of the following categories. These may vary at the end of the quarter depending on what kinds of assignments, exams, etc are given.

Final Project	50%
Midterm/Final	50%

Project: The project is the central part of the course. Students will be working on a specific idea of their choice following the DMAIC methodology. The project should result in a significant improvement of a process/system. More details will be provided during the first two weeks of class. Written report is required for the completion of the project.

Exams: Prior to the tests, more details will be discussed.

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CREA 807: Proposal and Literature Review Direction for Studies in Applied Creativity and Innovation

Faculty: Youngjin Kwon/New Hire

Course Description

This is the culminating core course in the program and prepares students for CREA 799: Proposal, where the dissertation proposal is finalized in concert with the Committee Chair and relevant Committee members. This is a benchmark juncture of the Ph.D. progress, as the attrition rate for ABD students is often cited as 50%; that is, they complete coursework, pass the qualifying exam, and never complete their dissertation, which marks the transition from student to scholar. Thus, emphasis will be on further developing research, writing, and thinking skills drawing from prerequisite coursework.

Course Goal

Upon completion of this course, students will produce a prototype first draft of their dissertation proposal comprising drafts of chapters one, two, three (and abstract) which synthesizes ways to enhance creativity and that reflects the history and theories of creativity and innovation. Also, included will be creativity research options that relate to the student's current research interests. It is understood that the research questions and literature review will change as more coursework is completed and deliberation of research design progress.

Instructional Approach/Format

The primary mode of instruction will be in-class or on line discussions, peer editing, and debates. Students will be expected to defend their ideas and logically explain how their research will be a scholarly contribution to further the body of literature in applied creativity and innovation.

Assessment and Evaluation

Mock Oral defense: (25% of the course grade)

A mock oral defense of your draft proposal will simulate the subsequent dissertation defense.

Draft Proposal and Draft Abstract: (75% of the course grade)

The draft proposal will form the basis for chapters one, two and three of the proposal for your dissertation study. Chapter One involves providing the context for stating the purpose of your dissertation study and your research questions. Chapter Two is the Review of Literature, which demonstrates your knowledge of previous and related research upon which your scholarly addition to the field of applied creativity and innovation is based. Chapter Three describes your proposed methodology. Of course, you are not expected to finalize your research questions at this stage of the program, but early focus on interests that may culminate in or lead to your study usually accelerates the doctoral program process. Emphasis will be on producing a literature review from which will emerge researchable questions, developing a point of view that is research based and amenable to further research, presenting and defending ideas, and communicating results of your search of the literature clearly. In addition, you will develop a draft abstract that will emerge from your draft proposal.

Criteria for draft proposal evaluation:

- Emphasis will be on establishing the purpose for your dissertation study
- The early draft literature review is based mainly on research in primary sources, provides the context for your dissertation study, and serves as the framework for your research questions.
- The methodology proposed is appropriate to the research questions.
- Use APA format throughout (e.g., usage, style, references).
- Meeting deadlines is a requirement for successful writers and therefore, required deadlines for submissions will be adhered to.

The rubric for proposal evaluation is:	1 (does not meet criteria)	D
	2 (meets some criteria)	C
	3 (meets most criteria)	B
	4 (meets all criteria)	A
	5 (exceeds all criteria)	A+

Required Proposal Format Aid:

Publication Manual of the American Psychological Association (Fifth Edition). (2002).
Washington, D.C.: American Psychological Association.

COURSE SCHEDULE

Date	Week	June- July- August- September 2007	
		Topic	Reading (complete before indicated week) Benchmark Activity
25	Week one	Creative process in poetry and fiction Overview of dissertation	Text: Introduction, Chapters 1, 2 Handout 1a: FAQ Handout 1b: Pepperdine Handout 1c: Why can't I get started Handout 1d: A scholarly document
2	Week two	Creative process in acting, visual arts, dance Preparing the proposal	Text: Chapters 3,4,5 Handout 2: Writing & presenting your thesis or dissertation
9	Week three	Creativity in	Text: Chapters 6,7

		music, physical sciences Writing and defending the dissertation	Handout 3: The writing center	
16	Week four	Creativity in psychology New theory Avoiding ABD	Text: Chapter 8, 20 Handout 4a: Procrastination = Doom Handout 4b: Writing your dissertation process	
23	Week five	Creativity in computer science; engineering Strategies for avoiding writer's block	Text: Chapters 9, 10 Handout 5: Helpful hints	Proposal draft due
30	Week six	Creativity in mathematics; leadership; emotions Research question or problem statement	Text: Chapters 11, 12, 13 Handout 5: Advice on research & writing; Useful research phrases	Abstract draft due
6	Week seven	Novelty and value in business domains	Text: Chapters 14, 15	Mock oral defense
13	Week eight	Creativity in teaching Generality vs. specificity debate	Text: Chapters 16, 17, 18	Mock oral defense
20	Week nine	Overlapping skills and traits Creativity theory revisited	Text: Chapters 19, 20 (reread)	Proposal due
27	Week ten	General feedback and discussion of proposal, abstract, mock oral defense		Abstract due
3	Week eleven	Labor Day (University Holiday)		

Required Reading:

Text: Kaufman, J.C. & Baer, J. (2005). *Creativity across domains: Faces of the muse*. Mahwah, N.J.: Lawrence Erlbaum Associates, Publishers.

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